COFFEE IN THE ECONOMY OF TANZANIA AND THE IMPLICATIONS OF MEMBERSHIP IN THE INTERNATIONAL COFFEE AGREEMENT

by

M. MICHAEL MSUYA

A thesis submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

(Development)

at the

UNIVERSITY OF WISCONSIN-MADISON

1979

TITLE OF THESIS COFFEE IN THE ECONOMY OF TANZANIA AND THE IMPLICATIONS OF MEMBERSHIP IN THE INTERNATIONAL COFFEE AGREEMENT

Major Professor John D. Strasma

Major Department Development

Minor(s)

Full Name M. Michael Msuya

Place and Date of Birth Ugweno, Pare, Tanzania

Colleges and Universities: Years attended and degrees

Bukalasa Agricultural College, Uganda: 1964-66: Diploma in Agriculture.

Haile Selassie I University, Ethiopia: 1968-70: BSc (Agric. Econ.)

University of Dar-es-Salaam, Tanzania: 1971-72: MA (Econ.)

University of Wisconsin-Madison: 1975-76: MS (Agric. Econ.)

Membership in Learned or Honorary Societies None

Publications None

Date February 22, 1979

COFFEE IN THE ECONOMY OF TANZANIA AND THE IMPLICATIONS OF MEMBERSHIP IN THE INTERNATIONAL COFFEE AGREEMENT

A thesis submitted to the Graduate School of the University of Wisconsin-Madison in partial fulfillment of the requirements for the degree of Doctor of Philosophy

BY

M. MICHAEL MSUYA

Degree to be awarded: December 19_____ May 19 79 August 19_____

Approved by Thesis Reading Committee:

Major Professor — Date of Examination: Feb. 22, 1979

Dean, Graduate School

ACKNOWLEDGEMENTS

It is more of a privilege than a right that I should sign my name to this work which is the product of the cooperative effort of so many. I will not attempt the impossible task of mentioning every one whose cooperation contributed to making this work a reality, even though each one of them deserves special mention. It would be unseemly, however, not to list a few names.

Professors John D. Strasma, Don Kanel and Warren J. Bilkey, members of my academic advisory committee, deserve special credit for moulding a bureaucrat's views into a work worthy of academic credence. The Tanzanian Ministry of Agriculture, my employer, is responsible for my interest in coffee, and deserves special thanks for granting me the opportunity to pursue the graduate study program that culminated in this study. The International Institute of Tropical Agriculture and the Ford Foundation deserve my appreciation for picking up the tab.

I owe special gratitude to the management and personnel of the Coffee Authority of Tanzania for their cooperation and tolerance of my prolonged intrusions. Ndugu John Malecela and Dereck Bryceson, current and former Ministers of Agriculture, and Tom Loudon, the Deputy Executive Director, respectively, of the International Coffee Organization deserve my special thanks for sharing their extensive experience in coffee and international diplomacy and helping me appreciate the link between diplomatic rhetoric and practice. Enzo Grilli, Joel Johnson and J. P. Hayes of the World Bank, U. S. Senate Foreign

Relations Committee, and the British Foreign and Commonwealth Office, respectively, deserve my gratitude for their invaluable suggestions and instilling some realism in my expectations of international commodity agreements. Finally I wish to especially thank all people, some of whose names I have listed in my list of interviewees and/or some of whose works I have cited elsewhere in the text, for providing the ideas that formed the building materials for this work.

To my wife, Angela, I owe particular appreciation for being all -- I do not believe I can ever make it up to her but ask for the opportunity nevertheless. To my sons Mcharo, Yohana and Kichungo, I can only pray that one day they will realize that it was out of love for them rather than selfishness, that I wasn't there when they needed me most. Finally, I wish to thank my mother, Esteri Nandera, for giving us life and livelihood, and for enduring when the odds were overwhelmingly against her.

Relations Committee, and the British Foreign and Commonwealth Office, respectively, deserve my gratitude for their invaluable suggestions and instilling some realism in my expectations of international commodity agreements. Finally I wish to especially thank all people, some of whose names I have listed in my list of interviewees and/or some of whose works I have cited elsewhere in the text, for providing the ideas that formed the building materials for this work.

To my wife, Angela, I owe particular appreciation for being all -- I do not believe I can ever make it up to her but ask for the opportunity nevertheless. To my sons Mcharo, Yohana and Kichungo, I can only pray that one day they will realize that it was out of love for them rather than selfishness, that I wasn't there when they needed me most. Finally, I wish to thank my mother, Esteri Nandera, for giving us life and livelihood, and for enduring when the odds were overwhelmingly against her.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS iii

TABLE OF CONTENTS v

LIST OF TABLES viii

LIST OF ILLUSTRATIONS xii

LIST OF SYMBOLS xiii

LIST OF ABBREVIATIONS xv

INTRODUCTION 1

CHAPTER

I COFFEE IN THE TANZANIAN ECONOMY: A HISTORICAL AND STRUCTURAL OVERVIEW 4

Tanzania: An Economic Background 4

The Tanzanian Coffee Industry 12

Historical and Structural Background 12

Economic Significance 18

II THE COMMODITY PROBLEM AND A WORLD MARKET FOR COFFEE: THE IMPACT OF THE INTERNATIONAL COFFEE AGREEMENT..... 37

The Instability Problem: A Reality or Myth?..... 37

The Trend Problem: Does it Exist?..... 40

What to Stabilize and Why 43

Export Instability: The "Does it Matter" Controversy 48

The Trend Problem: The Effects Controversy 55

The Outlook of a Free Market for Coffee 56

International Commodity Agreements: What Hope for the Commodity Problem? 69

The World Coffee Market: Aptness for International Commodity Agreement 73

The ICA Hopes and Fulfillments 77

III THE TRENDS, STABILITY, AND PURCHASING POWER OF TANZANIA'S COFFEE EXPORT EARNINGS 92

Description of Statistical Data and Methods of Analysis 94

Trends in Tanzania's Coffee Export Earnings 103

Trends in the Purchasing Power of Tanzania's Coffee Export Earnings 110

Instability in Tanzania's Coffee Export Earnings.. 121

Summary: The Results and the Interaction of Tanzania's Coffee Policies and ICA Operations.. 123

IV THE WORLD COFFEE MARKET, THE ICA, AND NEW OPPORTUNITES FOR INCREASED GAINS FROM COFFEE EXPORTS 129

The 1962 and 1968 ICAs 129

Price Objectives and the Quota System 129

Quest for Flexibility and Development of the 1976 ICA 140

The 1976 ICA: Innovations and Mofifications ... 141

Trends in Coffee Production in Africa, and Latin America 149

Brazil 149

The Rest of Latin America and Africa 154

Changing Long-term Weather Patterns 166

Trends in Demand for Coffee 169

The US Market 171

The Northwestern European Market 176

Other Major Markets: Europe, Canada, Australia and Japan 179

Summary and Conclusion 188

V COFFEE POLICIES: BACKGROUND AND RECOMMENDATIONS 204

Ongoing Production Programs 204

Increased Production: Technical Potentialities and Policy Options for Tanzania 206

Increasing Production Through Intensification . 206

Increasing Production Through Extensification . 216

What Type of Coffee to Produce 221

The Geographical Dispersion of Production 224

Marketing Policies: Domestic 226

Producer Price Stabilization and the Quantity and Quality of Producion 226

Growers' Prices in Tanzania and Neighboring Countries 231

Stocks Management and Product Uniformity 234

Marketing Policies: Export 244

Tanzania's Negotiating Experience and Policies Relating to the ICA 248

VI SUMMARY AND CONCLUSIONS 263

Production Policy Recommendations 270

Marketing Policy Recommendations 271

Policy Recommendations Relating to the ICA 273

APPENDIX 275

BIBLIOGRAPHY 305

LIST OF TABLES

Text Table		Page
1.	Taxes on International Trade: Contribution to Government Revenues	6
2.	Imported Industrial and Intermediate Goods, and Capital Formation	8
3.	Public Sector Contribution to Monetary Fixed Capital Formation	10
4.	Coffee Earnings: Impact on Growers' Incomes	19
5.	Coffee Contribution to Government Recurrent Revenue: 1970-1975	23
6.	Export Proceeds from Tanzania's Major Agricultural Exports and Percentage Contribution of Coffee to the Total Export Earnings (selected years 1945-1976)	25
7.	Coffee: Contribution to Investible Surplus: 1970-1975	31
8.	Impact of Coffee on the Gross Domestic Product: 1970-1975	32
9.	Developing and Developed Countries' Exports Instability Indices	39
10.	Coffee Export Earnings as Percentage of Total Export Receipts of the Countries Most Dependent on Coffee and Tanzania: 1970-74	58
11.	Price Elasticities of Supply for Coffee by Producing Areas	60
12.	The Frequency of Serious Brazilian Frosts: 1869/70 to 1974/75	62
13.	US Coffee Consumption by Age Groups	66
14.	US Regular Coffee Prices and Consumers' Income: Selected Years: 1946-1975	76
15.	Tanzania's Coffee Export Prices (Pta, Pxa): Relationship with Coffee Export Earnings	101

16. Tanzania's Volume of Coffee Exports (Qx): Relationship with Coffee Export Earnings (Vxa) 102

17. Trends in Tanzania's Coffee Export Earnings: (Vxa) 105

18. Trends of Tanzania's Volume of Coffee Exports (Qx) 108

19. Trends of Tanzania's Coffee Export Prices (Pta and Pxa) 109

20. Terms of Trade Indices for Tanzania's Coffee Exports 115

21. Tanzania's Coffee Export Earnings, Volume and Price Instability Indicators 122

22. Exportable Coffee Production Trends: Brazil, The Rest of Latin America and Africa 150

23. Brazilian Coffee Export Earnings as a Percentage of Total Export Earnings 154

24. Coffee Exports by ICA Members by Coffee Types to All Destinations (Five Year Averages 1956-60 to 1971-75) 170

25. Import Shares of Colombian Mild Arabicas and Robustas in the Major Market Areas 172

26. US Soluble Coffee Consumption 173

27. Price Differentials Between Robusta and Arabica Coffees 174

28. Northwestern Europe's Imports of Arabica Coffees from ICA Members as Percentage of Their Coffee Imports 177

29. Coffee Consumption in Britain 184

30. Coffee Consumption in Canada 185

31. Market Shares for Tea and Coffee in Japan 186

32. Coffee Yields in the Arusha and Kilimanjaro Areas 206

33. Effects of Copper Spraying on Yields (1960-62) 211

34.	The Effects of Copper Spraying and Fertilizer Application on Yields (1962)	211
35.	Effects of Interplanting Bananas with Coffee on Coffee Yields: 1960-63	213
36.	Areas Identified Under CEP for New Coffee Plantings	217
37.	Costs and Returns for Smallholder Production of Robusta and Arabica Coffee: Mid-1977	223
38.	Price Elasticities of Acreage and Productivity Estimates for Kenya Coffee	227
39.	CAT Coffee Classification Chart for 1970/71 and Producers' Price Determination	229
40.	Producer Price in Tanzania and Neighboring Countries: 1971-76	232
42.	Quality Standing of Centrally and Home Pulped Coffee in Arusha Region Cooperative Union Societies: 1968/69 and 1969/70	241
43.	Mozambique and Zambia's Green and Roasted Coffee Imports and Tanzania's Coffee Exports to these Countries	247
44.	Tanzania's Coffee Exports to the Socialist Countries of Eastern Europe and Asia: 1970-76	248
45.	Coffee Exports to Non-Quota Markets: Tanzania Versus the ICA Membership 1961/62-1971/72	250

Appendix Tables

		Page
1.	Tanzania Coffee Production - 1936-1976	276
2.	Tanzania Coffee Production by Regions	277
3.	Coffee: Share of GAPEX's Income Tax Payments	278
4.	Minor TCB/CAT Contributions to Fiscal Resources	279
5.	Coffee: Contribution to Government Revenue	280
6.	Contribution of Coffee to Investible Surpluses	281
7.	Tanzania Coffee Export Earnings, Volume and Unit Value	282
8.	Derivation of Tanzania's Coffee Export Price (Pta)	284
9.	Terms of Trade Indices for Tanzania's Coffee Exports (1962 = 100)	285
10.	An Indicator Price Index for Tanzania's Coffee Export Sales (Pia)	290
11.	Coffee Exports to All Destinations by ICA Member Countries by Coffee Types	291
12.	United States Coffee Imports by Types	292
13.	United States Coffee Consumption	293
14.	Coffee Imports: Northwestern Europe	294
15.	Coffee Imports: Others Europe, Canada Australia, Japan	296
16.	Trends in World Coffee Stocks 1962/63-1977/78	299
17.	Tanzania's Coffee Production, Sales and Stocks: 1962/63-1971/72	300
18.	Evolution of Tanzania's Coffee Export Quotas: 1963/64-1969/70	301

LIST OF ILLUSTRATIONS

Map		Page
	Coffee Growing Regions of Tanzania	14
Chart		
1.	Tanzania's Export Coffee Marketing Channel (Early 1978)	16
2.	Price Stabilization: Demand Shift Market with Price-inelastic Demand	45
3.	Price Stabilization: Demand Shift Market with Price Elastic Demand	45
4.	Price Stabilization: Supply Shift Market with Price-elastic Demand	46
5.	Price Stabilization: Supply Shift Market with Price-inelastic Demand	47
6.	Coffee Production	63
7.	Tanzania Coffee Exports Volume, Earnings, and Price	111
8.	Terms of Trade Indices for Tanzania's Coffee Exports	116
9.	Unit Value Indices for Tanzania's Coffee Export Earnings, Selected Imports and the Implied Commodity Terms of Trade for Export Earnings	118
10.	Tanzania's Indices for: Coffee Export Earnings, Unit-Value for Selected Imports and the Income Terms of Trade for the Coffee Export-Earnings	120

LIST OF SYMBOLS

Vx = Tanzania's coffee exports proceeds.

Qx = Tanzania's volume of coffee sold for export.

Px = Vx/Qx

Iu = United Nations' index of unit values of manufactured exports of the developed market economies; base year 1962.

Vxa = Tanzania's export earnings from coffee deflated by Iu.

Pxa = Vxa/Qx

Pta = Average annual New York spot prices for Colombia Mild Arabicas and Robustas, weighted by the respective ratio of Tanzania's volume of exports of these types of coffee to the country's total coffee export sales.

Pia = Average International Coffee Organization's Indicator Price for Colombia Mild Arabicas, Unwashed Arabicas, and Robustas weighted by the respective ratio of Tanzania's volume of exports of these types of coffee to the country's total coffee export-sales, deflated by Iu.

Qe = Tanzania's annual effective export quota under the International Coffee Agreement.

Vmi = Value of a given imported good, i = 1, 2, ..., 6.

Qmi = Quantity of a given good's imports, i = 1, 2, ..., 6.

Pm_{01} = Average unit value of imports index (1962 = 100).

Px_{01} = Unit value of Tanzania's coffee exports index (1962 = 100).

Tc_{01} = Commodity Terms of Trade Index for Tanzania's Coffee exports (1962 = 100).

Ti_{01} = Income Terms of Trade Index for Tanzania's Coffee exports (1962 = 100).

S = Standard deviation.

b_0 = Estimated value of the dependent variable when the independent variable = 0.

b_1 = Estimated shape of trend line.

LIST OF ABBREVIATIONS

AID = Agency for International Development.

ASN = Ammonium Sulphate Nitrate.

BOP = Balance of Payments.

CAT = Coffee Authority of Tanzania.

CBB = Coffee Berry Borer.

CBD = Coffee Berry Disease.

CEP = Coffee Expansion Program.

CFA = Communaute Franco Africaine.

CIF = Cost Insurance Freight.

CIP = Coffee Improvement Program.

CP = Central Pulpery.

CIP = Consumer Price Index.

DC = Developed Country.

EEC = European Economic Community.

FAO = Food and Agriculture Organization.

FAS = Foreign Agricultural Service.

FOB = Free on Board.

FPI = Food Price Index.

FRG = Federal Republic of Germany.

GAO = General Accounting Office.

GAPEX = General Agricultural Products Export Corporation.

GATT = General Agreement Tariffs and Trade.

GDP = Gross Domestic Product.

GFO = Gross Farm Output

b_2 = Estimated curvature or acceleration coefficient of trend line

t = Time in years.

t^2 = Square of t.

u = Error term.

HA = Hard Arabica.

IACO = Inter-African Coffee Organization.

IBC = Instituto Brasileiro do Cafe (Brazilian Coffee Institute).

IBRD = International Bank for Reconstruction and Development.

ICA = International Coffee Agreement.

ICC = International Coffee Council.

ICO = International Coffee Organization.

IFIAS = International Federation of Institutes of Advanced Study.

IMF = International Monetary Fund.

INTRATA = International Trading Corporation of Tanganyika.

ISI = Import Substitution Industrialization.

KNCU = Kilimanjaro Native Cooperative Union.

LDC = Less Developed Country.

MA = Mild Arabica.

MDB = Market Development Bureau.

MFC = Monetary Fixed Capital Formation.

MFC_p = Public Monetary Capital Formation.

NDCA = National Development Credit Agency.

OAS = Organizatization of American States.

OPEC = Organization of Petroleum Exporting Countries.

PACB = Pan-American Coffee Bureau.

R = Robusta.

SA = Sulphate of Ammonia.

STC = State Trading Corporation.

TCB = Tanganyika Coffee Board.

TCGA = Tanganyika Coffee Growers Association.

TOT = Terms of Trade.

TTA = Tanzania Tea Authority.

UNCTAD = United Nations Conference on Trade and Development.

USDA = United States Department of Agriculture.

INTRODUCTION

We seek in this work to develop recommendations for policies that will enable Tanzania to enhance her gains from trade in coffee, in view of the changing environment in the world coffee and economic scene generally. We start in the first chapter with an introduction to the Tanzanian economy and identification of the place of coffee in this economy. In the second chapter we review literature relating to the structure of the international coffee market, the commodity problem and justification for international market intervention in the form of the International Coffee Agreement (ICA). The third chapter is an attempt to assess, empirically, the effectiveness of the ICA on Tanzania's gains, defined in terms of the agreement's objectives as increased stability and progressively increasing trend in the real value and purchasing power of income derived from trade in coffee. We devote chapter four to a review of Tanzania's fortunes in the ICA and the trends in world coffee production and consumption. Finally, in chapter five we review ongoing coffee programs and practices in Tanzania and develop the said policy recommendations based on the country's experience as well as the current and expected market environment.

Two sets of factors determine the extent to which Tanzania gains from its involvement in the world trade in coffee. First is the group of factors which, for purposes of the present study, we term endogenous factors. Within this group fall such factors as production policies, quality controls and management efficiency, all

of which factors are largely a function of voluntary actions of agents within the country's economy. These factors could be government, industry, or grower-determined or - effected. The distinguishing trait is that they are to a large degree within the willful control of agents within the country's economy. Distinct from this category of factors is the second set of factors, which we refer to as exogenous factors. In this category we include all factors, geographically domestic or foreign to Tanzania, that are largely beyond the willful control of agents within the country's economy. Under this category fall such factors as market prices, export quotas, changes in consumer demand and adverse weather conditions (be they domestic or foreign to the country).

This second set of factors is further sub-divided into:

(a) Exogenous factors that originate from man-made decisions and as such are subject to negotiations within the ICA or other multilateral or bilateral framework, as would, for example, be the case with coffee export quotas within the ICA, and preferential market arrangements between the European Economic Community (EEC) and the associated African countries, of which Tanzania is one.

(b) Exogenous factors that originate from man-made decisions but whose occurrence is not negotiable. In this category are included such factors as changes in consumer demand, long-term changes in world production patterns, and technological advances affecting either or both production and consumption.

(c) Phenomenal occurrences that may have their origins in man-

made decisions or natural circumstances. Examples of these occurrences include extreme weather conditions such as serious frosts in Brazil, extreme monetary instability such as occurred at the beginning of this decade, and labor strikes affecting a major aspect of the world coffee economy such as an extended longshoreman strike in major United States coffee ports of entry.

Before we start the intended discussion and analyses of the factors of concern in the present study, it is in order to outline some aspects of the historical and structural background to the Tanzanian economy and the way in which coffee and the commodity's world trade fit into this economic framework. That is the subject of the first chapter.

CHAPTER I

COFFEE IN THE TANZANIAN ECONOMY: A HISTORICAL AND STRUCTURAL OVERVIEW

Tanzania: An Economic Background

"My own country, Tanzania," states Mwalimu Julius K. Nyerere, President of the United Republic of Tanzania, "has the doubtful distinction of being included among the United Nations' list of the 25 poorest countries of the world."[1] With a per capita Gross Domestic Product (GDP) at current prices of $143 in 1975, the equivalent of $43 in constant 1962 prices,[2] there is little doubt that the "distinction" is well earned. If it is any consolation, this income index in real terms has in fact improved, though with some oscillations, from its level of $20 in 1950.

The agricultural and livestock production sector of the economy, which over the decade ending in 1975, made an average contribution of 37 per cent to the country's GDP,[3] is by far the most important sector of the economy. Over this same period of time, the wholesale and retail trade, restaurants and hotels sector, the second most important contributed under 13 per cent on average, while the manufacturing, and handicrafts sector accounted for a mere 10 per cent. These later sectors trailed the public administration and other services sector, as well as the finance, insurance, real estate and business services sector, which accounted for 11.6 and 10.2 per cent of the GDP, respectively. At the same time, eight of the most important agricultural export

commodities -- coffee, cotton, sisal, cloves, cashew nuts, tobacco, tea and meat, accounted for between 60 and 75 per cent of the country's total export earnings, further underscoring the dominance of the agricultural sector in the economy.

Needless to say, the producers of these commodities and the people whose work it is to process and market the commodities realize a major portion of their cash incomes from the sale of these commodities. Through the added purchasing power of these initial recipients of income from the sale of the said export commodities, the benefits extend to other producers of goods and services from whom the farmers buy their requirements. The government gets part of its share of gains from these sales in the form of added indirect tax revenues, particularly sales taxes, resulting from the increased demand for domestic and imported goods and services.

On these agricultural exports are levied export duties, which, despite their usual tendency to yield unstable revenue returns,[4] have, as is evident in text Table 1, gained relative prominence as sources of government revenues during recent years, partly as a result of the post-1970 commodities price boom. An even greater contribution to government revenues derives from the fact that the export proceeds thus realized are used to purchase imports from abroad, imports which are subjected to custom and excise duties. Between 1970 and 1975, under an agreement with Kenya and Uganda, the other two members of the now defunct East Africa Community, Tanzania imposed a transfer tax on goods imported from the two countries. These taxes, here grouped together

TABLE 1

TAXES ON INTERNATIONAL TRADE: CONTRIBUTION TO GOVERNMENT REVENUES

Year	Total Recurrent Revenue ($ mn.)	Total Tax Revenue ($ mn.)	Customs and Excise Duties ($ mn.)	Export Duties ($ mn.)	Transfer Tax ($ mn.)	Total Taxes on International Trade($ mn.)	Taxes on International Trade as: % Recurrent Revenue (%)	Taxes on International Trade as: % Tax Revenue (%)
1950	28.0	22.8	10.3	2.0	-	12.3	43.9	53.9
1955	51.0	40.4	17.3	1.4	-	18.7	36.7	46.3
1960	58.0	47.7	28.7	0.1	-	28.8	49.7	60.4
1965	94.7	78.1	47.1	4.1	-	51.2	54.1	65.6
1970	220.8	165.1	72.5	6.6	1.3	80.4	36.4	48.7
1971	235.6	191.0	77.7	7.7	0.8	86.2	36.6	45.1
1972	260.3	200.3	79.8	6.3	1.0	87.1	33.5	43.5
1973	336.1	256.0	93.2	12.6	0.9	106.7	31.7	41.7
1974	423.2	351.4	121.1	29.8	0.8	151.7	35.8	43.2
1975	532.3	426.3	107.0	30.5	0.2	137.7	25.9	32.3
1976	467.6	394.0	80.9	18.6	-	99.5	21.3	25.3

Sources: (i) Tanzania Government, Financial Statement and Revenue Estimates, Government Printer, Dar-es-Salaam (several).
(ii) Tanzania Government, Hali ya Uchumi wa Taifa (Economic Survey), Government Printer, Dar-es-Salaam (several).
(iii) Tanzania Government, Statistical Abstract, Government Printer, Dar-es-Salaam (several).

Note: For rates of exchange from the Tanzanian Shilling to the US dollar, see Footnote 5 of this chapter.

as taxes on international trade, have traditionally been the most important source of government recurrent revenues in Tanzania. This fact is clearly indicated in text Table 1.

This rather heavy reliance of the Tanzanian economy on foreign trade becomes even more apparent when one looks at the role that imports play in the country's capital formation. Text Table 2 is indicative of this role.

The original data from which text Table 2 has been compiled is suspect of some oversights, the consequences of which are reflected in this table. For one thing, it appears that even after lagging some of this data for various lengths of time (see Footnote 6), to account for the time lag between the date of importation of such goods and their incorporation into the country's capital stock, the contribution of imports remains overly exaggerated, at least on some years; e.g., 81 per cent of monetary capital formation in 1969. This problem originates in part from an apparent understatement of capital formation in the non-monetary sector. The Economic Survey (Hali ya Uchumi wa Taifa) assigns an average contribution of this sector of less than 25 per cent of capital formation during the 1960's. During the 1970's this contribution has fallen to an average of 8 per cent, an expected trend since the economy is becoming increasingly monetized. However, even then the share attributed to this sector appears to be inappropriately small. As an example, the Economic Survey lists only the increase in the value of cattle as contributing an increase in the stock of capital from this sector, ignoring the increase in the value of other livestock, including sheep and goats which the Food and Agriculture Organization

TABLE 2

IMPORTED INDUSTRIAL AND INTERMEDIATE GOODS, AND CAPITAL FORMATION[a]

Year	Total Capital Formation ($ mn.)	Monetary Capital Formation ($ mn.)	Imports of Intermediate Industrial Goods ($ mn.)	Imported Industrial and Intermediate Goods as Percent of: Total Capital Formation (%)	Monetary Capital Formation (%)
1969	180.0	154.3	125.3	69.6	81.2
1970	289.4	263.1	112.7	38.9	42.8
1971	362.7	334.7	131.2	36.2	39.2
1972	341.5	309.1	193.6	56.7	62.6
1973	393.1	357.5	225.0	57.2	62.9
1974	492.2	455.0	245.7	49.9	54.0
1975	540.1	499.2	297.1	55.0	59.5
1976	556.5	517.0	315.8	56.7	61.1
1977	585.2	540.0	339.2	58.0	62.8

Note:

[a]See Footnote 6 for compilation details

Source: Tanzania Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977-78, (Dar-es-Salaam: Government Printer, 1978), Jedwali (Table) 7 and 8.

estimated in 1976 to number 2.9 and 4.6 million, respectively, in Tanzania. Also not included are increases in the value of crops including coffee, tea, cashew nuts, cloves, pyrethrum and tobacco, crops which earn the country most of its foreign exchange. In addition, the assessment of the contribution of intermediate goods or even industrial machinery imports to capital formation is a matter of considerable guesswork. As mentioned in Footnote 6, these goods take different lengths of time to become incorporated into the country's capital stock. Certain goods, such as cars and pickups imported as intermediate goods, end up being used for final consumption. On the other hand, some imported industrial goods and machinery never get to be installed. All these facts contribute to the said over-statement of imports' contribution to capital stock. However, even with all these possible weaknesses of compilation, and considering that Tanzania has an insignificant domestic capacity to produce machinery and equipment as well as raw materials other than agricultural commodities, there is little doubt that imports make an enormous contribution to the country's capital formation. Therefore, the country's ability to raise adequate foreign exchange from its participation in international trade so as to acquire such imports is vital to its development effort.

Since the Arusha Declaration (Tanzania's socialist manifesto) in 1967, the government has assumed an ever growing role in planning, directing and even executing the day-to-day operations of the country's economic activities. This trend towards greater government participation in the economic activities of the country is borne out in text Table 3, which traces the growth of the public sector's (government, and public

TABLE 3

PUBLIC SECTOR CONTRIBUTION TO MONETARY FIXED CAPITAL FORMATION

	1955	1960	1965	1967	1969	1971	1973	1975
Monetary Fixed Capital Formation (MFC) ($ mn.)	87.0	65.6	85.3	137.1	132.8	245.8	217.3	205.7
Public Monetary Fixed Capital Formation (MFC_p) ($ mn.)	32.8	22.1	34.1	86.2	78.4	187.0	166.5	138.3
MFC_p as per cent of MFC (%)	37.7	33.7	39.9	62.9	59.0	76.1	76.6	67.2

Note: Dollar values are in constant 1962 dollars (see Footnote 2). Exchange rates in Footnote 5 have been used to convert Tanzanian Shillings to Dollars.

Sources: (i) MFC and MFC_p 1955 and 1960: U.N., Yearbook of National Accounts Statistics, (New York: United Nations, 1967).

(ii) Tanzanian Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977-1978, (Economic Survey 1977-78), (Dar-es-Salaam, Government Printer, 1978), p. 15.

corporations otherwise referred to as parastatals) share of Monetary Fixed Capital Formation over the two decades ending in 1975.

This growing role of the public sector in the nation's economic operations underscores the increasing need for the government's ability to project, with a high degree of confidence, the country's future receipts of both domestic and foreign financial resources. Such a forecasting ability is essential for the country to be able to effectively plan for its development and solicit resources with which to execute these plans.

Unfortunately, partly as a consequence of the extremely low level of income in Tanzania, indicating a very low buying capacity on the part of the country's masses, and her minute industrial base, the country finds itself having to rely very heavily on foreign markets to sell her marketable production and buy her development requirements. This results in Tanzania having to bow to external forces that influence not only the demand for her exports, which in turn determines the quantity she can sell and the price at which she can buy them. These realities greatly diminish the confidence with which the country's planners can forecast future export earnings and expenditures on imports. Furthermore, as has been indicated earlier, this apparently undue influence of international trade on the country's development variables also extends to government revenues, private incomes, and investment and capital formation. The net effect of this is a major impediment on the country's ability to plan and effectively carry out plans towards its chosen development goals.

Therefore, for Tanzania every opportunity for international cooperation in stabilizing commodity markets and thus increasing the predictability of demand, supply, and price is worthy of serious consideration since it offers the only practical opportunity for the country to influence, in a small way though it may be, the exogenous negotiable factors and possibly participate in internationally concerted efforts to combat, cope with, or moderate the effects of non-negotiable exogenous factors. This study is an attempt to analyze Tanzania's experience as a participant in one such international effort - the ICA. However, before going on, it is proper to introduce the historical and structural features of the Tanzanian coffee industry and its impact on the national economy.

The Tanzanian Coffee Industry

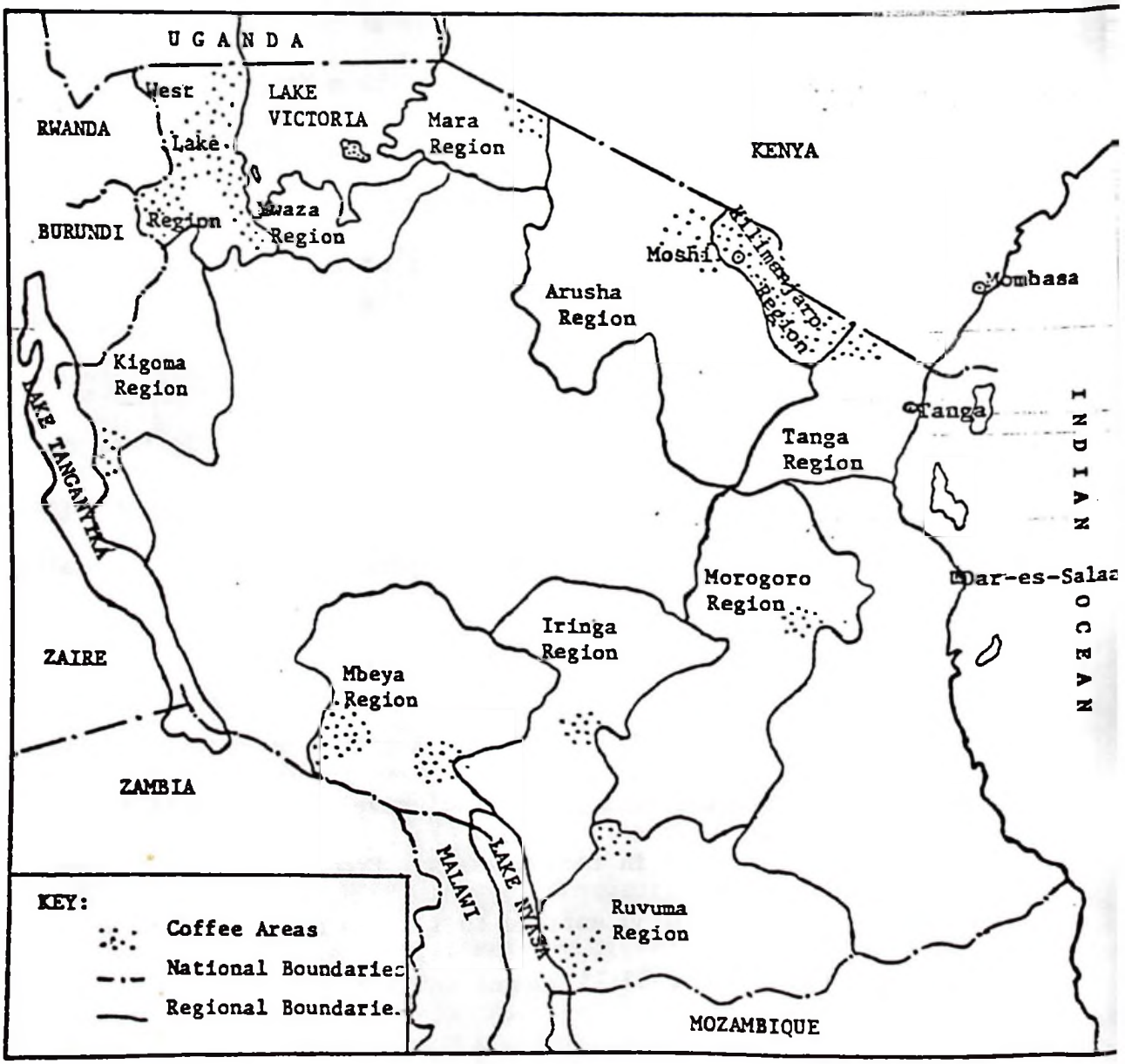
Historical and Structural Background

Tanzania produces both Arabica and Robusta coffees on a commercial scale. As is implied by the generic name, Robusta coffees are agronomically more hardy. They also have a poorer quality standing relative to the Arabicas. The Robustas are said to have been introduced to the Bukoba district of Tanzania during the 1600's from Uganda by Banyoro (an African ethnic group) conquerors. Arabica coffees, on the other hand, are relatively newer to the country, having been planted by European Christian missionaries for the first time on the slopes of Mount Kilimanjaro, now the most important coffee growing area in Tanzania, about the year 1900.[7] In later years, Arabica coffee was also introduced in the Bukoba and surrounding districts where

like the local Robusta crop, it was and continues to be, sun-dried into Hard-Arabica coffee. This is in contrast with the Arabica coffee produced in the Kilimanjaro area which is wet-processed (pulped) into Mild-Arabica coffee. Robusta remained dominant in the composition of Tanzania's coffee production up to the 1950's. By then the two generic coffee types were at par with a total production of between 13,500 and 19,800 tons between them (see Appendix Table 1). Thereafter, partly due to the dearth of suitable land in their traditional growing areas, the Robusta and Hard Arabicas' production stagnated. The Mild Arabicas' production continued to expand, not only within the Kilimanjaro area but also in other areas of the country, attaining peak production in 1976 (see Appendix Tables 1 and 2).

There are three main coffee growing zones in Tanzania (see Map 1). The Northeastern zone comprising Arusha, Kilimanjaro and Tanga Regions, is the largest zone. Except for Tanga Region (the Usambara mountains), where production in 1976 was about one per cent of the zone's total production, this zone specializes in Mild Arabica production. As may be seen from Appendix Table 2, Tanga Region's production has since the 1960's been changing from almost exclusively Robustas to almost exclusively Hard Arabicas in recent years. Production in this zone has shifted from about 50:50 estates to smallholders' shares during the early 1940's to about 25:75 shares in 1976. The Northwestern zone comprising of West Lake, Mara and Mwanza Regions is the second largest producing area. The zone produces both Robusta and Hard-Arabica coffees, with an overwhelming predominance of Robustas - 81 per cent

TANZANIA; COFFEE GROWING AREAS



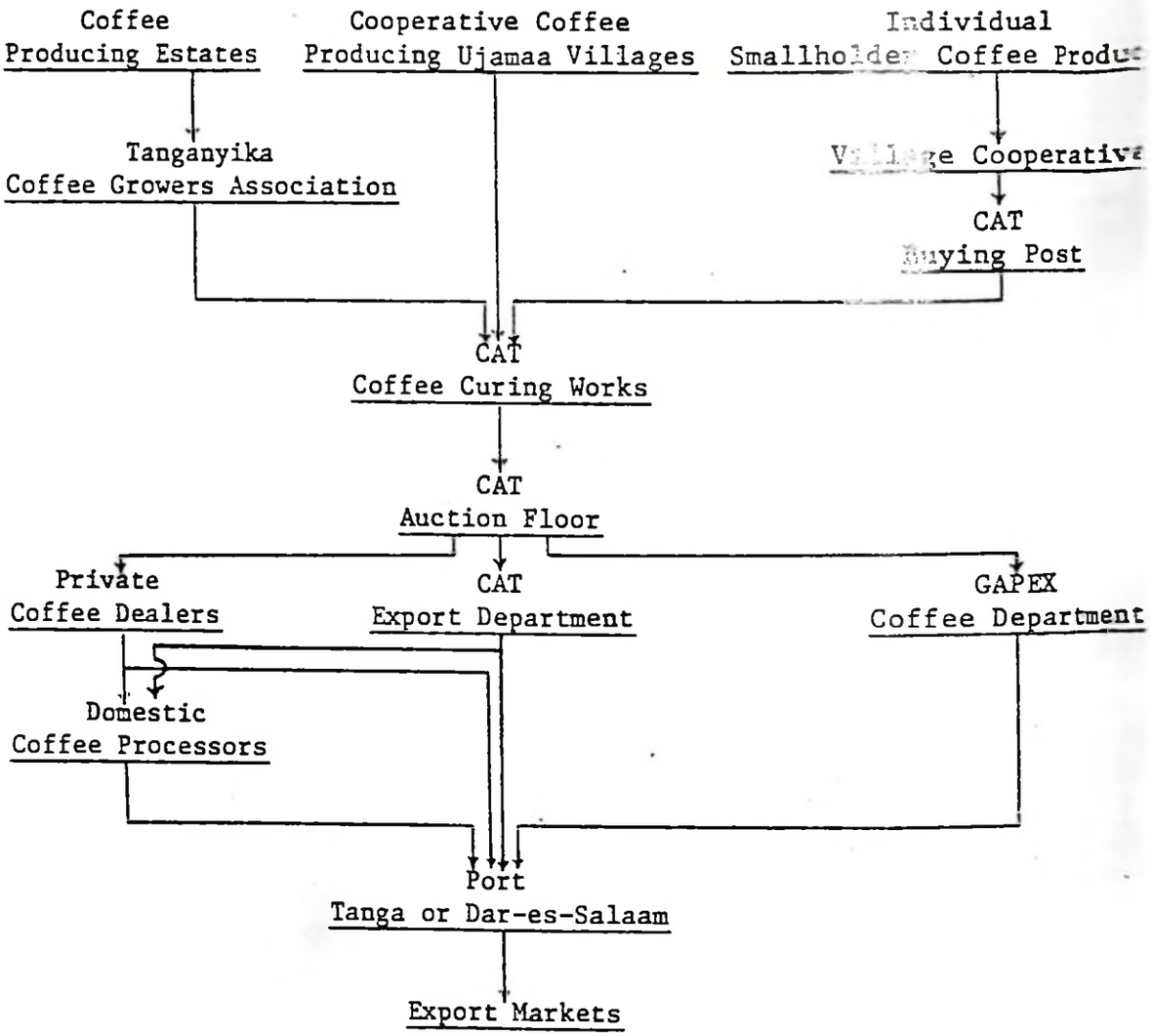
in 1976. Practically all coffee in this area is smallholder produced. The last major producing area is the Southern zone which embodies the Iringa, Mbeya, and Ruvuma Regions. The area specializes in Mild Arabicas and production is predominantly at smallholder scale. Here there are two hamlets of the remnants of the 1950's coffee planting experia in Morogoro and Kigoma Regions. Morogoro produces both Robustas and Hard Arabicas while Kigoma specializes in Mild Arabicas. In both cases the production scale is almost exclusively smallholder.

As of January 1, 1977, the Coffee Authority of Tanzania, established under the Coffee Industry Act of 1976, assumed the marketing and regulatory responsibilities of the Tanzanian coffee industry previously held under the Coffee Industry Ordinance of 1961 by the Tanganyika Coffee Board (TCB). Unlike its predecessor, however, the CAT has also been charged with the responsibility of coordinating production and related services, including research and extension services as well as the procurement and distribution of recommended production and other inputs.

Chart 1 traces the path that coffee follows from production to the point of export. As the chart indicates, there are three organizational groups of coffee producers in Tanzania today: estates, cooperative coffee-producing Ujamaa villages,[8] and individual smallholder producers. At the time of the Arusha Declaration, the turning point of large scale private enterprise in Tanzania, there were about 299 estates in the country, mostly owned and operated privately by/or on behalf of European settlers, but there were also a few that were owned by Asians

CHART 1

TANZANIA'S EXPORT COFFEE MARKETING CHANNEL (EARLY 1978)



and Africans. Most of these have now been nationalized and/or otherwise handed over to parastatals or ujamaa villages or are in the process of making the transition. Estates that are still privately operated and those that are currently operated by parastatals market their coffee through the Tanganyika Coffee Growers' Association (TCGA) which functions as an estate producers' cooperative. The cooperative coffee-producing ujamaa villages,[9] on the other hand, are their own cooperative societies that market their cooperatively produced coffee directly to the CAT. In 1976 the government disbanded the conventional marketing cooperatives through which individual smallholder producers used to market their produce. This produce marketing function was handed over to ujamaa village cooperatives which collect privately grown produce and sell it to the respective parastatals - CAT in this case, at the appropriate buying post.

The CAT delivers the coffee beans (parchment coffee in the case of Mild Arabica) to its curing works where the beans are cured and quality graded ready for auctioning. In the case of the hard coffees (Robusta and Hard Arabica) which are sold by the producers in the form of dried cherries, the coffee is first hulled and then cured, and quality graded for sale. As is indicated in Chart 1, there are three categories of buyers at these CAT acutions -- the CAT Export Department, the General Agricultural Products Exports Corporation (GAPEX) and private dealers. All these three categories of auction participants buy coffee either on their own accounts, or as is more often the case, on commission basis for foreign and domestic users or dealers. Partici-

pation in the auctions is subject to a license issued by a coffee licensing authority consisting of representatives of the CAT, producers, the trade and government. We might add here that GAPEX is, as its name implies, a general purpose agricultural export parastatal which deals in coffee only as one of the commodities it handles -- the main one though it is.

Economic Significance

The CAT estimates that there are about 250,000 coffee smallholdings in Tanzania.[11] In 1965 an International Coffee Organization study[12] estimated that the Tanzanian coffee estate sector employed between 14,000 and 16,000 people. This figure is not likely to have changed much since then in view of the erosion of incentives for expansion in the estate sector following the Arusha Declaration in 1967, and the now almost complete nationalization of the sector. To these figures may be added the hundreds or even thousands of people who, either directly or indirectly, provide services to the industry. This last category includes people who provide research, extension, marketing, processing and other services.

The national census in 1967 estimated that the average Tanzanian family consisted of 5 people. On the basis of this estimate, the coffee industry is a major source of economic livelihood for nearly 10 per cent of the country's population, estimated at 15 million in 1976. This fact may be appreciated even better by comparing an estimate of coffee growers' receipts per capita and the per capita GDP of the monetary economy in text Table 4.

TABLE 4

COFFEE EARNINGS: IMPACT ON GROWERS' INCOMES

	1970	1971	1972	1973	1974	1975
Monetary GDP (Factor Costs) ($ mn.)	820.4	882.7	994.8	1179.2	1428.7	1582.8
National Population (mn.)	13.2	13.5	13.9	14.2	14.5	14.9
Total Payments to Coffee Growers ($ mn.)	36.1	36.9	40.8	50.9	35.1	42.5
Coffee Growers' Population (mn.)	1.1	1.1	1.1	1.2	1.2	1.2
Per capita Monetary GDP ($)	62.2	65.4	71.6	83.0	98.5	106.2
Per capita coffee growers' receipts ($)	32.8	33.5	37.1	42.4	29.3	35.4
Per capita coffee receipts as per cent of per capita monetary GDP (%)	52.7	51.9	51.8	51.1	29.7	33.3

Sources: (i) Tanzania Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977-78, (Dar-es-Sallam: Government Printer, 1978).

(ii) CAT Records.

pation in the auctions is subject to a license issued by a coffee licensing authority consisting of representatives of the CAT, producers, the trade and government. We might add here that GAPEX is, as its name implies, a general purpose agricultural export parastatal which deals in coffee only as one of the commodities it handles -- the main one though it is.

Economic Significance

The CAT estimates that there are about 250,000 coffee smallholdings in Tanzania.[11] In 1965 an International Coffee Organization study[12] estimated that the Tanzanian coffee estate sector employed between 14,000 and 16,000 people. This figure is not likely to have changed much since then in view of the erosion of incentives for expansion in the estate sector following the Arusha Declaration in 1967, and the now almost complete nationalization of the sector. To these figures may be added the hundreds or even thousands of people who, either directly or indirectly, provide services to the industry. This last category includes people who provide research, extension, marketing, processing and other services.

The national census in 1967 estimated that the average Tanzanian family consisted of 5 people. On the basis of this estimate, the coffee industry is a major source of economic livelihood for nearly 10 per cent of the country's population, estimated at 15 million in 1976. This fact may be appreciated even better by comparing an estimate of coffee growers' receipts per capita and the per capita GDP of the monetary economy in text Table 4.

TABLE 4

COFFEE EARNINGS: IMPACT ON GROWERS' INCOMES

	1970	1971	1972	1973	1974	1975
Monetary GDP (Factor Costs) ($ mn.)	820.4	882.7	994.8	1179.2	1428.7	1582.8
National Population (mn.)	13.2	13.5	13.9	14.2	14.5	14.9
Total Payments to Coffee Growers ($ mn.)	36.1	36.9	40.8	50.9	35.1	42.5
Coffee Growers' Population (mn.)	1.1	1.1	1.1	1.2	1.2	1.2
Per capita Monetary GDP ($)	62.2	65.4	71.6	83.0	98.5	106.2
Per capita coffee growers' receipts ($)	32.8	33.5	37.1	42.4	29.3	35.4
Per capita coffee receipts as per cent of per capita monetary GDP (%)	52.7	51.9	51.8	51.1	29.7	33.3

Sources: (i) Tanzania Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977-78, (Dar-es-Sallam: Government Printer, 1978).

(ii) CAT Records.

This table shows that coffee earnings accounted for between 29.7 and 52.7 per cent of the monetary GDP per capita in the coffee growing areas of Tanzania over the six years between 1970 and 1975. Needless to say, this table presents a very rough indication of the impact that coffee earnings have on growers' incomes. A major weakness of the table is that it assumes that all coffee growers are average income earners, comparable to the rest of the population. In fact, by Tanzanian standards, coffee producers are believed to earn above national average incomes. Nonetheless, the conclusion that may be drawn from the table as to the impact of coffee on the commodity's producers' incomes tallies well with other evidence including the Second Five Year Development Plan's assessment [13] that in 1967, Kilimanjaro Region had the country's highest Monetary Gross Farm Output (GFO)[14] per capita. This region, which during the 1966/67 coffee season produced about 58 per cent of Tanzania's marketed coffee, had a GFO per capita of $38.8 compared to a national average of $14.1 and $3.9 for Singida Region, the most impoverished region. Rweyemamu[15] points out that it is coffee which enabled Kilimanjaro region to attain the income status it has. Kilimanjaro Native Cooperative Union (KNCU, the cooperative union that handled about 70 per cent of Kilimanjaro Region's coffee production during 1966/67) and CAT statistics bear out Rweyemamu's position very well. On the basis of these statistics, the per capita KNCU coffee grower's receipts from coffee was $116 during the 1966/67 season.

Coffee contributes to the Treasury in three main ways. First, by way of a coffee export tax, which in recent years has topped the list

in government revenue yielding among commodity export taxes. Between 1964 and 1976 this tax contributed, on the average, 49.1 per cent (ranging from 1.1 to 72.4 per cent) of export tax revenues. This contribution was equivalent to 1.5 to 4.6 and 1.2 to 3.8 per cent of the country's total tax and recurrent revenues respectively.

Secondly, corporate taxes and remittances to the Treasury or towards public services that would otherwise have to be financed by other sources of government revenues. In this category we include a share of GAPEX's income tax payment that is attributable to the corporation's coffee business. Also included are TCB/CAT's charges and coffee levy,[17] both of which are deducted from coffee sales proceeds, before payment to growers, to finance the parastatal's operating expenses including administrative, production advisory services, research, processing, and marketing expenses. The Development Levy, in force during 1965 and 1966, and income tax levied on TCB/CAT's property earnings such as interest on bank deposits and rental income, are also included here. The derivation of GAPEX's tax payment in respect of its coffee business is presented in Appendix Table 3 while Appendix Table 4 is a summary of TCB/CAT contributions to government revenues other than the coffee export tax.

Finally, people and corporate bodies that are engaged in coffee production or providing services to the industry pay taxes which are either directly related to their earnings from coffee, e.g., income tax paid by estate coffee producers, or indirectly related to these earnings, e.g., sales taxes paid by producers on purchases made with their earnings

from coffee. Needless to say, this category of contribution to government revenues cannot be completely quantified but an attempt is made in Appendix Table 5 to estimate the contribution. Text Table 5 summarizes the overall contribution of the coffee industry to government revenues.

It should be mentioned here that in deriving the share of coffee in the sales taxes, customs and excise duties, and transfer taxes, a uniform pattern of expenditure in relation to income was assumed for the entire nation, of which those involved in coffee are part. A major weakness in this assumption lies in the known fact that the expenditure pattern of individuals depend on several factors, among which are the size of income and the environment, physical or otherwise. As already mentioned, the income level of coffee farmers in Tanzania is likely to be above the national average. It is therefore possible that they will tend to adopt an expenditure pattern slightly different from that of the average Tanzanian. On the other hand, smallholder coffee producers, being rural people like other peasant farmers, are likely to spend less of their incomes on imported goods than would urban people, yet a uniform ratio of income (defined as monetary GDP) to custom and excise duties has been adopted to arrive at coffee income earners' share of these taxes. A similar weakness may be expressed with respect to the derivation of the estate coffee producers' share of income taxes, in which a ratio of monetary GDP to income tax revenue has been adopted. The unreliablity of these methods of estimation, is fully appreciated, however, given the present state of data availability in Tanzania, it is difficult to come up with much more accurate estimation procedures.

TABLE 5

COFFEE: CONTRIBUTION TO GOVERNMENT RECURRENT REVENUE: 1970-1975

	1970	1971	1972	1973	1974	1975
Total Coffee industry contribution to Government revenue ($ mn.)	9.2	10.9	10.1	18.1	24.1	15.6
Coffee industry contribution as per cent of total tax revenue (%)	5.6	5.7	5.0	7.1	6.8	3.6
Coffee industry contribution as per cent of government recurrent revenue (%)	4.1	4.6	3.9	5.6	5.7	2.9

Source: Appendix Table 5

We should mention here that smallholder coffee producers, like other peasants in Tanzania, are not subject to direct forms of taxation.

Up to the mid-sixties, sisal was the undisputed leading foreign exchange earner for Tanzania (Tanganyika before 1964). Thereafter this position has changed hands between sisal, cotton and coffee. In recent years coffee has consistently led in this race. Text Table 6 traces the respective export earnings contribution of the five most important agricultural export commodities and the percentage share of coffee in total export proceeds.

The impact of coffee on Tanzania's investible surplus[18] is the aggregate of the commodity's shares of foreign exchange earnings, fiscal, corporate and farmers' resources that do not go to meet final consumption needs during a given accounting period. As shown in text Table 6, coffee contributes very substantially to Tanzania's foreign exchange earnings, earnings which are used in part to pay for the country's imports bill. A major part of these imports -- between 63 and 74.7 per cent during the period between 1970 and 1975 (see Appendix Table 6) is destined for use as intermediate and capital goods. The portion of foreign exchange that goes towards financing this category of imports is a genuine contribution to the country's investible resources, and a proportionate share of these finances attributable to coffee is the commodity's contribution to these resources. In Appendix Table 6 this contribution is shown to range between $32.0 million and $59.7 million during the period 1970 to 1975.

The impact of coffee on the country's fiscal resources has been discussed at some detail above. It is implied in Appendix Table 6

TABLE 6

EXPORT PROCEEDS FROM TANZANIA'S MAJOR AGRICULTURAL EXPORTS AND PERCENTAGE CONTRIBUTION OF COFFEE TO THE TOTAL EXPORT EARNINGS (SELECTED YEARS 1945-1976)

Year	Coffee ($ mn.)	Cotton ($ mn.)	Sisal ($ mn.)	Cloves ($ mn.)	Cashew Nuts ($ mn.)	Percentage Coffee (%)
1945	3.6	3.0	12.3	na	0.2	10.9
1955	19.3	15.5	27.9	na	2.4	19.1
1965	24.0	34.2	40.0	6.4	11.5	13.7
1970	43.7	34.6	25.1	15.2	19.4	17.0
1971	31.8	34.3	18.8	25.1	20.7	11.7
1972	53.6	47.0	20.3	33.6	24.2	17.7
1973	70.5	47.4	31.7	33.2	24.8	19.8
1974	52.5	66.2	64.8	12.3	34.0	13.5
1975	65.2	40.0	40.8	43.3	29.8	17.7
1976	153.0	73.1	28.6	31.1	15.7	31.5

Notes: na = not applicable (cloves are produced in Zanzibar which joined Tanganyika to form Tanzania in 1964).

Source: Annual Trade Report of Kenya, Uganda and Tanzania, (Mombasa, Kenya: East African Customs and Excise Department, several issues).

that a fairly sizeable portion of government revenues goes towards the creation of investible surpluses in the government sector. Again, a share of these revenues proportional to coffee's contribution to them may rightly be regarded as coffee's contribution to capital formation in that sector of the economy.

Traditionally, the cooperative movement and the TCB/TAT have played a leading role in the operations of the coffee industry in Tanzania. Since about 1962/63, one or other of the country's trading parastatals (public corporations) has participated in the export trade of coffee, starting with the International Trading Corporation of Tanganyika (INTRATA) followed by the State Trading Corporation (STC) and since 1973 the General Agricultural Products Export Corporation (GAPEX). The marketing cooperatives, whose functions have since 1976 been taken over by Ujamaa villages, provided their members not only with production and marketing services, including coffee husbandry requirements and facilities for storage, primary processing and transportation, but also financial support for human capital development. Cooperatives built general purpose elementary and secondary schools as well as more specialized training centers to train future coffee and other technicians. They sponsored students for training at universities and other institutions of learning. They financed and/or operated consumer shops for their members and society at large. When the official policy was for expanding production or replacing wornout coffee trees, the cooperatives provided the planting materials. When the policy changed in favor of diversification, they

provided the material, e.g., dairy breeding stock and/or the finances required to enable their memebers to carry out such policies. Together with the government and the TCB/CAT, the coffee cooperatives financed the construction and/or maintenance of feeder roads to facilitate coffee collection in their areas.

The TCB/CAT continues to provide facilities for transporting coffee beans from the primary cooperative societies (now CAT buying posts) to the curing works, curing the beans and preparing them for sale, as well as storing them before they are sold and exported. Over its history, the TCB/CAT has had responsibilities for executing or supervising the execution of different production programs including coffee research, disease controls and central coffee pulperies' operations. As for now, GAPEX's contribution in this respect is limited to the share of its income tax that goes towards government capital formation and other government services that contribute to the creation or replenishment of investment resources. A major part of the contribution of these services and facilities to the nation's investible resources could be estimated, but as this is not the main theme of the present study, efforts to specifically isolate this contribution have been limited to the exercise carried out in Appendix Table 6.

Lastly, and probably the area in which statistical evidence is weakest, is the contribution from the producers' sector. In Appendix Table 6, it is shown that this sector contributed annually $3.4 million to $7.8 million during 1970 to 1975 to investible resources, the equivalent of 1.6 to 2.8 per cent of the tabulated total coffee

contribution. These figures most probably underestimate the actual contribution of this sector for several reasons.

Between 1963 and 1976, on average, 77 per cent of coffee production in Tanzania came from the smallholder sector of production. This means that about a proportionate share of the proceeds from sales accrued to the sector,[19] a sector very poorly documented in official statistics. To arrive at this sector's tabulated contribution to investible surplus, a blanket ratio of GDP to investible surplus was applied on farmers' proceeds from coffee. This procedure assumes that the allocation of expenditure between final consumption and other forms of expenditure is uniform nation-wide. However, a casual comparison of the living standards in the main coffee producing areas and other parts of the country causes one to be wary of this assumption. In the major coffee areas, people live in relatively modern houses, eat better and spend more of their incomes on education of their children, consumer durables and accumulation of wealth generally. In a recent study,[20] Nyerembe observes that:

> Coffee has become the main source of wealth for the education of children, building better houses and the establishment of local business enterprises.

It is also worth noting that coffee is one of the more highly capitalized smallholder-produced crops in the country. Individual producers usually own their spraying, pulping, cleaning, drying, and even transport equipment such as wheelbarrows, and even pick-ups in some instances.

Rowe, addressing himself in 1962 to the coffee economy of the Kilimanjaro coffee belt, notes that,

> In the belt, bananas are not only a main subsistence crop, but also the largest cash crop, and it is now a well-established fact that coffee is only a subsidiary cash crop despite its large total value
> . . . . . .
> Thus the average coffee income per family is not very large at present prices despite the undoubted fact that it is coffee which provided relatively good houses and other amenities during the recent years of much higher prices.[21]

Expressing a sentiment similar to the foregoing and that quoted previously from Nyerembe, but in a more general context, MacBean notes that in Tanzania,

> Cash crops are in general sources of marginal incomes for the purchase of 'luxuries' or the accumulation of wealth...[22]

From the foregoing it may be concluded that the authors agree on the premise that, although coffee may not be the most important source of revenue, it is the single most important source of what one may term "developmental finances" for smallholder producers. This source of finance should be distinguished from cash received from the sale or exchange of subsistence commodities, which, despite their comparatively much larger size in the aggregate, tend to be spent almost entirely on minor final consumption items rather than on major investments such as housing because they are realized by the producer in very small sums at a time. It should be remembered though that these so called "minor final consumption items" including meat, sugar, clothing and the like, are not unimportant since they contribute to human capital development. The relatively greater consumption of these items in the coffee producing areas of the country is indicative of the better living standards characteristic of these areas.

When all the foregoing is considered, one cannot help suspecting that the producers' sector actually contributes much more to investible resources than Appendix Table 6 and the official statistics, from which the appendix has been developed, give it credit for. Text Table 7 summarizes the results of Appendix Table 6 and puts them in a national perspective.

An assessment of coffee's contribution to Tanzania's GDP may be approximated, taking into account the weaknesses described in the foregoing discussion, by summing up the commodity's contribution to export proceeds, government revenues and coffee growers' receipts. Text Table 8 is a summary of the commodity's impact on GDP, both monetary and overall. To facilitate comparison of this contribution over time, the entries have been deflated using the United Nations' index of unit values of manufactured exports from developed market economies for 1962, i.e., 1962 = 100.

TABLE 7

COFFEE: CONTRIBUTION TO INVESTIBLE SURPLUS: 1970-75

	1970	1971	1972	1973	1974	1975
Total coffee contribution to investible surpusl ($ mn.)	38.4	32.0	46.5	59.7	38.9	50.0
Total National investible surplus ($ mn.)	219.7	236.6	256.5	286.3	216.4	228.6
Percentage coffee contribution (%)	17.5	13.5	18.1	20.9	18.0	21.9

Source: (i) Appendix Table 6

(ii) National investible surplus calculated by deducting consumption expenditure given in: United Nations, Yearbook of National Income Accounts Statistics, Volume II, (New York: United Nations, 1976), Table 1a, p. 1146, from GDP (at purchasers' value).

TABLE 8

IMPACT OF COFFEE ON THE GROSS DOMESTIC PRODUCT: 1970-75

	1970	1971	1972	1973	1974	1975
GDP (Monetary) ($ mn.)	820.4	882.7	994.8	1179.2	1428.7	1582.8
GDP (Total) ($ mn.)	1150.1	1240.0	1404.5	1636.5	1961.4	2291.3
Coffee Export Proceeds ($ mn.)	43.7	31.8	53.6	70.5	52.5	65.2
Coffee contribution to government revenue ($ mn.)	9.2	10.9	10.1	18.1	24.1	15.6
Coffee growers' receipts ($ mn.)	36.1	36.9	40.8	50.9	35.1	42.5
Coffee contribution:						
Total ($ mn.)	89.0	79.6	104.5	139.5	111.7	123.3
Percentage of GDP (total) (%)	7.7	6.4	7.4	8.5	5.7	5.4
Percentage of GDP (monetary) (%)	10.8	9.0	10.5	11.8	7.8	7.8

Source: Appendix Table 5, and Text Table 6.

Text Table 8 indicates that over the period of time between 1970 and 1975, coffee had a very significant, though declining, impact on the country's income. The declining trend is part of a wider declining trend in the relative importance of agriculture to the national economy as other sectors slowly expand. However, even with the decline, coffee is still a very important contributor to the nation's income, particularly considering the expressed suspicion that the tabulated data actually underestimates the significance of coffee to different components of the national income.

FOOTNOTES

1. Julius K. Nyerere, "The Case of the Poor," speech delivered at Howard University, Washington, D.C., August 5, 1977.

2. Current values deflated by United Nations index of unit values of manufactured exports from developed market economies for 1962, obtained from: Coffee Prices in Current and Constant Terms, EB 1401/75 (E), Rev. 2, (London: International Coffee Organization, September 20, 1976).

3. United Nations, Yearbook of National Accounts Statistics, Volume II, (New York: United Nations, (1976), Table 4a, p. 1147.

4. M. Msuya, "Export Taxes and Economic Development: The Tanzania Coffee Export Tax as an Example." Unpublished paper prepared for Agricultural Economics 767, University of Wisconsin-Madison, December 15, 1976, p. 15.

5. Rates of exchange between the Tanzanian Shilling and the US Dollar:

Year:	up to 1949	1950-72	1973	1974	1975	1976	1977
Sh/$	4,983	7.143	7.021	7.143	7.414	8.379	8.274

Sources: (i) Exchange rates up to 1970: International Monetary Fund (IMF), Schedule of Par Values, Vols. 1-51, (Washington, D.C.: IMF, several issues).

(ii) Exchange Rates for 1971 to 1977: IMF, International Financial Statistics, Vol. XXXI, #6, (Washington, D.C.: June 1978).

6. Imported capital, and intermediate goods (those that do get to form part of the capital stock, assumed here to constitute 50 per cent of all intermediate goods imports other than construction equipment and materials) become incorporated into the country's capital stock only after varying lengths of time - road building materials may take 5 years or even longer, while transport equipment is likely to take about one year. Therefore in compiling text Table 2, different types of these goods have been lagged for different lengths of time. Road and housing construction intermediate goods have been lagged 2 years, while other intermediate goods are lagged one year; transport equipment is lagged one year and other industrial machinery and equipment 2 years. Exchange rates noted in footnote 5 have been used here.

7. Tanganyika Coffee Board, Coffees of Tanzania, (Moshi, Tanzania: Tanganiyika Coffee Board, 1974).

8. Ujamaa is a Swahili word which roughly means "familyhood." An Ujamaa village, therefore, is a village organized so that property, production, and marketing activities, and the proceeds thereof are communally owned and shared by the members within the Ujamaa context, or one that is destined to develop towards that objective.

9. Cooperative coffee-producing ujamaa villages are villages that produce coffee on a cooperative or communal basis, depending on the stage of socialist development that the village has attained. The produce is sold undistributed and at the season's end the members decide, in conference, how the proceeds are to be used or how much should be distributed.

10. Ujamaa village cooperatives have members who produce coffee privately but who sell their coffee through the cooperative. Such villages could well be cooperative production ujamaa villages with regard to other commodities, but as far as coffee is concerned, the village only serves as a marketing cooperative.

11. Market Development Bureau (MDB), Price Policy Recommendations for the 1978/79 Agricultural Price Review, Annex 10, Coffee. R3 77, (Dar-es-Salaam: MDB, Ministry of Agriculture, August 1977), p. 3.

12. International Coffee Organization (ICO), Tanzania: Information on the Most Important Relevant Aspects, Country Study #30, (London: ICO, August 1967), p. 5.

13. Tanzania Government, Second Five-Year Development Plan Volume III, (Dar-es-Salaam, Government Printer, 1969), p. 9.

14. Monetary Gross Farm Output is defined as the total value of all marketed agricultural and livestock production during a given year.

15. Juvenal A. Rweyemamu, "Coffee in the Tanzanian Economy 1962-1972." An unpublished independent study presented at the University of Dar-es-Salaam in partial fulfillment of the requirements for the M.A. in Economics, (June 1974), p. 16.

16. TCB payment to KNCU in 1966/67 was Sh. 53,985,665.50 (TCB's Annual Report 1966/67) and the KNCU estimates that during 1966/67 there were 65,000 coffee producers in its area of operation. This yields Sh. 830.55 per grower which, at Sh. 7.143 per US dollar (the exchange rate then), is equivalent to $116.30.

17. The TCB/CAT charges and coffee levy are not usually recorde in government revenue records since the monies they yield do not physically get to the Treasury. However, since these monies are actually a deduction from what would otherwise have accrued to coffee growers as additional coffee income and are instead used to finance the operations of TCB/CAT, a 100 per cent statutory body, they are here treated as a contribution of the industry to government revenues.

18. Investible surplus is defined as the excess of GDP over final consumption.

19. The actual smallholders' share of the proceeds is likely to have been less than their share of production since on the whole their coffee is of a lower quality and therefore fetches a lower average price than that from the estates.

20. B. E. Nyerembe, "Trends in Rural Development, Agriculture: Hai Division, Kilimanjaro District," Unpublished Political Science Paper, 7(A), University of Dar-es-Salaam, (March 1973), pp. 6-7.

21. J. W. F. Rowe, The World's Coffee. (London: Her Majesty's Stationary Office, 1963), p. 130.

22. Alasdair I. MacBean, Export Instability and Economic Development. (Cambridge, Massachusetts: Harvard University Press, 1966), p. 161.

CHAPTER II

THE COMMODITY PROBLEM AND A WORLD MARKET FOR COFFEE: THE IMPACT OF THE INTERNATIONAL COFFEE AGREEMENT

As an exporter of primary comodities, Tanzania is intimately interested in what has come to be known as the "Commodity Problem". Frank writes;

> From the perspective of the developing countries, the commodity problem (excluding petroleum) has traditionally been viewed as consisting of two aspects: the short-term instability of markets for primary products as reflected in wide year-to-year fluctuations in prices and export earnings; and the adverse longer-term trends in commodity markets as reflected in deteriorating terms of trade and sluggish growth in export earnings.[1]

According to this definition the problem is composed of two basic problem areas--instability and adverse trends. These problem areas are discussed separately in the pages that follow, starting with instability.

The Instability Problem: A Reality or Myth?

The economics profession is by no means unanimous over the existence or for that matter, the extent of detriment this problem has on LDC economies or their development. Law[2] notes that as early as the 1930's, the League of Nations conducted studies of price fluctuations of several commodity markets and discovered some extreme problems. Since then the United Nations, other international and national agencies as well as private individuals, have conducted more

studies in an attempt to further explore the problem, its implications and possibilities of its solution.

A United Nations study[3] in 1952 analyzing 1901 to 1950 data for the LDCs revealed "marked fluctuations in proceeds from exports... whether measured on a cyclical basis or from year to year." Different commodities and countries were shown to have been differently affected but "practically all showed a substantial degree of instability."[4] The study also found LDC exports to the United States to be more vulnerable to price fluctuations and experience greater year-to-year fluctuations in volume than those from other countries.[5] A joint study by the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD)[6] found exports from the LDCs to be more unstable than those from the industrial countries. Some of this study's findings are reproduced in text Table 9.

TABLE 9

DEVELOPING AND DEVELOPED COUNTRIES' EXPORTS INSTABILITY INDICES

	Average of Fluctuation Indices[a] (%)		Dispersion Around The Average[b] (%)	
	1950-65	1953-65	1950-65	1953-65
Developing Countries:				
Prices	3.7	2.1	1.1	0.6
Quantities	5.6	4.5	2.7	3.3
Earnings	6.2	4.2	2.1	1.6
Industrial Countries:				
Prices	8.8	6.8	3.1	2.8
Quantities	9.5	8.0	8.4	4.5
Earnings	11.8	9.6	7.1	6.1

Notes:

[a]Average annual percentage deviation, neglecting sign, from the trend, estimated by fitting a linear relation between time and the logarithms of the annual observations.

[b]Standard deviation from the mean.

Source: IMF/IBRD, "The Problem of Stabilization of Prices of Primary Products," A Joint Staff Study, Part I, (Washington, D.C.: IMF/IBRD, 1969), Table 15, p. 41 and Table 19, p. 59.

Similar results have been obtained by many students of the problem[7] leading Helleiner to conclude that:

> It is now generally agreed that export prices, quantities and total earnings are all more unstable in the average poor country than in the average rich one.[8]

MacBean,[9] Coppock,[10] and Massells[11] studies have been widely cited as having produced results that contradict this "generally held" view. One commonality between these three studies is that they all

analyzed data for the years between 1946 and 1958. Kenen and Voivodas[12] analyzing similar data for 1950-58, 1950-66 and 1956-67 separately, have found some of these results that were contrary to the said generally held view to be peculiar to the 1950's.[13] For example, with respect to the effect of instability on growth of output, Kenen and Voivodas found their export instability index (standard error of their export proceeds regression equation divided by the mean of the export proceeds) to be positively related to growth in output in both of the equations they fitted for the 1950-58 interval--the coefficient of instability index was positive and statistically significant at the 0.05 level. On the other hand, during the other intervals, 1950-66, and 1956-67, the index's coefficient was statistically insignificant in all of the six equations they fited for these intervals and the sign of the coefficients was negative in one half of these equations. This leads one to suspect that the MacBean, Coppock and Massels' results are anomalous but nevertheless important in that they serve to warn against over generalization.

The Trend Problem: Does It Exist?

Controversy over the existence of the trend problem a la Frank has been around for a long time. Morgan[14] traces the controversy back to 1912 when Keynes intimated that the terms of trade (TOT) of primary products were rising due to diminishing returns characteristic of primary production. This claim was repeated by Robertson three years later. In 1923 Beveridge noted "approximate stability" in these terms when

both productivity and demand trends in agriculture and industry are considered. Then in 1943 Kindleberger reported declining TOT for producing countries resulting in part from increasing efficiency. This was followed by the Prebisch era at the end of the 1940's and early 1950's explaining the falling TOT of the LDCs as a consequence of rising wages of unionized labor and monopolistic pricing in developed countries (DCs) markets.

The discussion continued throughout the 1950's; according to Morgan: Arthur Lewis in 1955 saw the poor LDCs' TOT as resulting from wages in these countries' export sectors being "fixed by peasant earnings level." The following year Kindleberger restated his stance on the falling TOT but this time not with respect to primary commodities but the LDCs "due to lack of flexibility in economic adjustments." This Kindleberger explanation was shared by Gunnar Myrdal, who in the same year attributed this trend to "bad luck" plus lack of flexibility. But also in 1956 Ellsworth found the trend to be "partly spurious and partly explained by successive ad hoc causes." The following year Aubrey predicted rising TOT of specific primary commodities and in 1959 Morgan found "heterogeneous experience (and)...diverse dominant influences from different commodities, countries and times." Bernstein noted and explained, in 1960, falling TOT of primary products as resulting from a "secular fall in raw material content of industrial output." This diversity of evidence lead Morgan to conclude that:

> No monotonic hypothesis stands up well to this diversity of experience. ..., we need to look hard to the particular ad hoc influences that for a particular commodity, country and time are relevant.[15]

This conclusion is also shared by Powelson[16] who in a recent (1977) study comparing the TOT indices for several Latin American countries and those of the United States, found mixed results between countries, commodities and years. Closer to bay, (with respects to Tanzania and coffee) a 1975 Commonwealth of Nations secretariat study[17] comparing the F.O.B. export prices of major primary commodities exported by the Commonwealth LDC members with prices of their manufacture imports between 1960 and 1972, also observed a considerable diversity of experience. However, generally the study indicated a deterioration in the TOT of primary commodity exports over the period of its concern. As regards Tanzania's coffee exports, the trend in the TOT was steadily downwards except for a lone upswing in 1964 -- the TOT index declined from 109 in 1960 to 95 in 1972.[18]

Looking through the numerous reports of study findings on this problem, one finds the thrust of the criticism against its existence to center around technicalities of analytical methodology, rationale, and most of all, the extent of generalization justifiable by findings that support the falling TOT thesis, as well as the effect and policy recommendations drawn from these findings, rather than whether or not the problem exists, at least with regard to the majority of the LDCs and their primary commodity exports. Very few study findings unequivocably negate the thesis (in recent years petroleum and its exporting countries are probably the most conspicuous deviants to the general trend).

What to Stabilize and Why?

Brook et al. note that an element of confusion that often clouds discussion of possible solutions to the stabilization problem is "the assumption that price stabilization would automatically yield revenue stabilization as well."[19] This is a wrong assumption. Whether export price stabilization results in export earnings stabilization, will depend on the characteristics of the commodity in question (e.g., whether it is a mineral or agricultural product; the degree of geographical concentration of production, etc.), source of the commodity's instability (whether supply or demand conditions), and its supply and demand elasticities.[20] Helleiner points out that many empirical studies have shown that for individual poor countries, export volume instability has tended to exceed price instability during the post-1945 period.[21] For such countries, therefore, price stabilization is not likely to result in the stabilization of export earnings.

Brook et al. have pointed out that whether or not price stabilization will stabilize proceeds depends on the source of price changes (demand or supply shifts) and the commodity's price elasticities of demand and supply schedules.[22] They have demonstrated, though under restrictive assumptions,[23] that if a commodity's market is characterized by demand, instability and demand is price-inelastic over the relevant range, price stabilization by suppliers or through a suppliers/demanders agreement, also yields revenue stabilization over two periods of time during which a demand shift occurs (see Chart 2). However, if demand is price-elastic over the relevant range, price stabilization will desta-

bilize revenue (see Chart 3). The results of Charts 2 and 3 will hold regardless of the price-elasticity of supply. Under both these conditions the supply schedule adopts a horizontal configuration at the level of Ps.

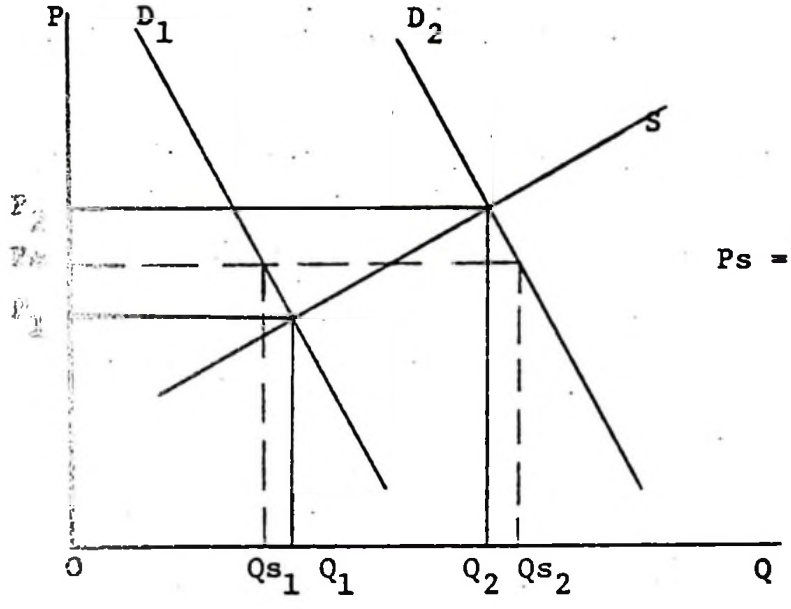
If a commodity market is characterized by supply instability, the stabilization of price at Ps results in a horizontal supply curve at the level of Ps. In the event that the commodity's demand curve is price-elastic in the relevant range, this price stabilization will destabilize revenue (see Chart 4). This would be the case regardles of the price elasticity of supply. On the other hand, if both demand and supply are price inelastic over the relevant range price stabilizatic can also result in revenue stabilization (see Chart 5).

Michalopoulos and Perez see a limited scope of revenue stabilization through the control of quantities produced and/or supplied to the market. They emphasize that production controls are only necessary if the object is to raise price. This objective might be appropriate where a commodity faces a very sluggish growth rate or an absolute decline in demand resulting in a persistent downward trend in prices. In these circumstances a deliberate control of supply could stabilize earnings, though the need for care in adjusting supply cannot be overemphasized since in the event controls are too strict price could go too high and, coupled with too limited supplies, hasten the loss of market unless demand was very price-inelastic.

Michalopoulos and Perez in common with Brook et al. analysis note that in commodity markets characterized by instability from the demand side, such as is the case with minerals and metals markets, price

CHART 2

PRICE STABILIZATION: DEMAND SHIFT MARKET WITH PRICE-INELASTIC DEMAND



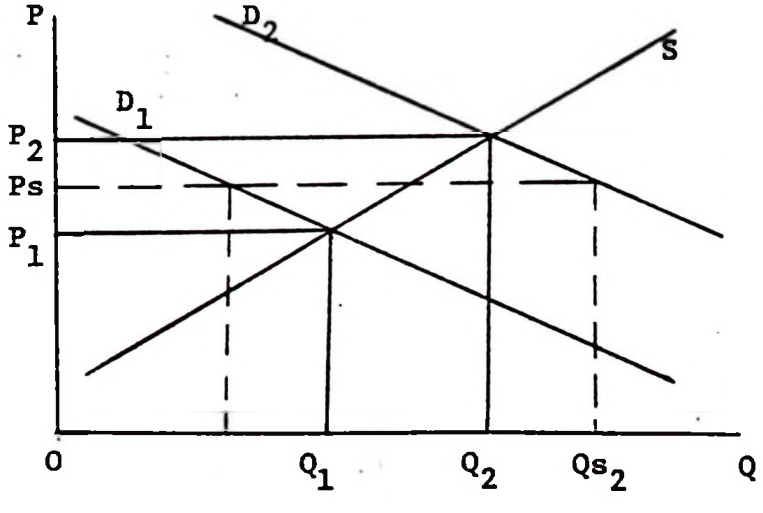
$$Ps = \frac{OP_2 + OP_1}{2}$$

When price is stabilized at Ps, revenue is also stabilized. In other words, the change in revenue when price is stabilized at Ps is less than the change in revenue when price is not stabilized.

$$\text{i.e.} \quad \frac{(OPs \times OQs_2)}{(OPs \times OQs_1)} < \frac{(OP_2 \times OQ_2)}{(OP_1 \times OQ_1)}$$

CHART 3

PRICE STABILIZATION: DEMAND SHIFT MARKET WITH PRICE-ELASTIC DEMAND



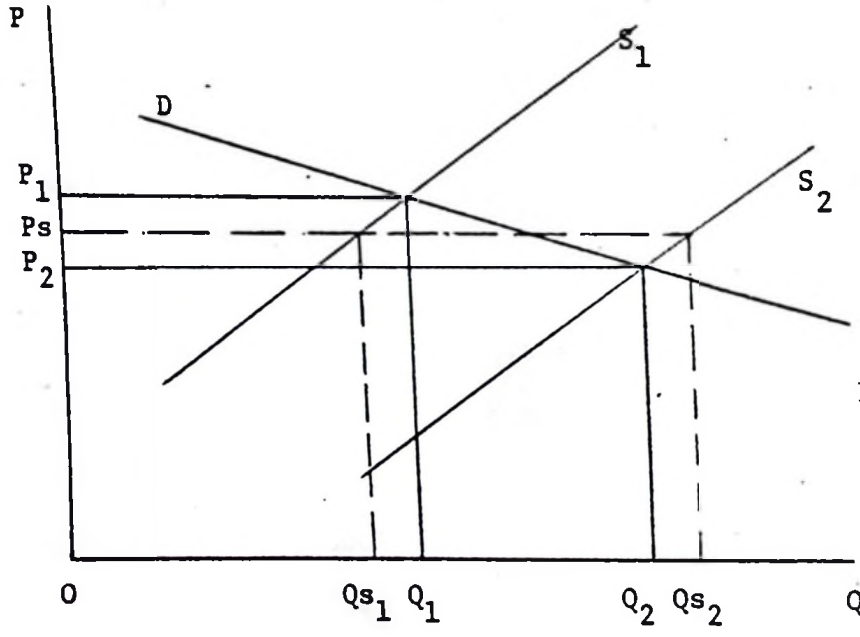
$$Ps = \frac{OP_2 + OP_1}{2}$$

If price is stabilized at Ps, revenue is destabilized. Put in other words, the change in revenue when price is stabilized at Ps is greater than when price is not stabilized.

$$\text{i.e.} \quad \frac{(OPs \times OQs_2)}{(OPs \times OQs_1)} > \frac{(OP_2 \times OQ_2)}{(OP_1 \times OQ_1)}$$

CHART 4

PRICE STABILIZATION: SUPPLY SHIFT MARKET WITH PRICE ELASTIC DEMAND



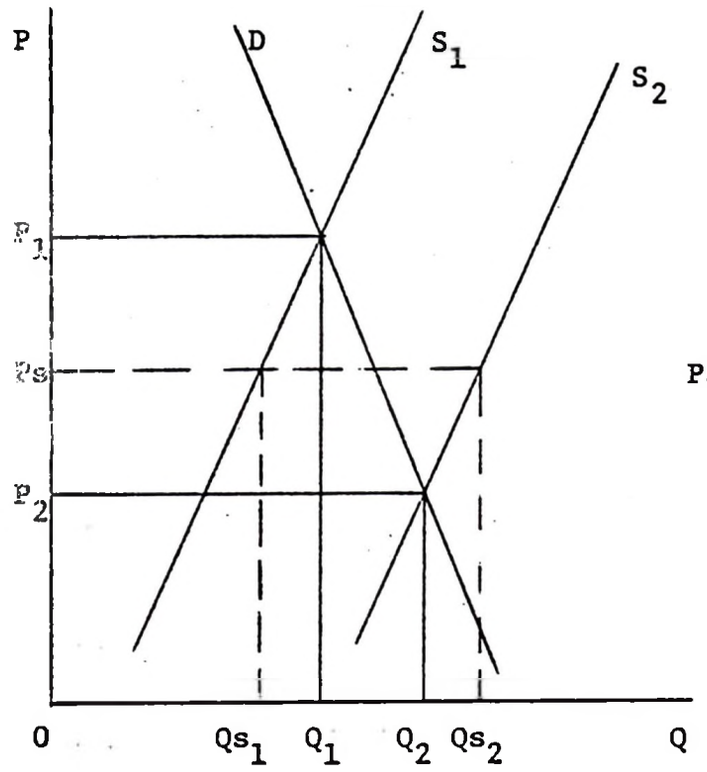
$$Ps = \frac{OP_2 + OP_1}{2}$$

If price is stabilized at Ps, revenue is destabilized. In other words, the change in revenue with price stabilization is greater than without price stabilization.

$$\text{i.e.} \quad \frac{(OPs \times OQs_2)}{(OPs \times OQs_1)} > \frac{(OP_1 \times OQ_1)}{(OP_2 \times OQ_2)}$$

CHART 5

PRICE STABILIZATION: SUPPLY SHIFT MARKET WITH PRICE INELASTIC SUPPLY AND DEMAND



$$Ps = \frac{OP_2 + OP_1}{2}$$

If price is stabilized at Ps, revenue is stabilized. In other words, the change in revenue with price stabilization is less than without price stabilization.

$$\text{i.e.} \quad \frac{(OPs \times OQs_2)}{(OPs \times OQs_1)} < \frac{(OP_1 \times OQ_1)}{(OP_2 \times OQ_2)}$$

Notes: Subscript s denotes stabilized variable.

Subscripts 1 and 2 dentoe first and second periods respectively.

stabilization is likely to result in revenue stabilization for exporter In markets where the main source of instability is on the supply side as in many agricultural commodity markets, price stabilization will stabilize earnings if the market exhibits inelastic demand conditions.

It should be noted that revenue stabilization, rather than price o quantity stabilization, is emphasized because most studies have shown stability in revenue to be more closely related to economic performance than either price or quantity alone. In any case revenue is really the ultimate objective of stabilization whether it be through price or quan The choice between the variables is really to do with which of the latter two most directly influences revenue rather than between revenue or price or quantity.

Export Instability: The "Does It Matter" Controversy

The argument in support of a close relationship between LDCs' export instability and their economic performance is originally (at leas in a historical sense), built on the a priori scenario that

i) LDCs rely for a main source of their development resources, especially capital goods and technology from abroad;

ii) these resources have to be purchased with foreign exchange;

iii) the main source of LDCs' foreign exchange earnings is their primary commodity exports; therefore

iv) instability in these commodities' export markets, will interfere with the flow of LDCs' export earnings and thus lead to bottlenecks in their economic development efforts.

As one may judge from literature and international dialogue, the argument has attracted a large following amongst theorists, researchers and policy makers alike, but it has not gone unchallenged. Its proponents argue that export instability, be it with respect to prices or quantities, tends to encourage the development of, and/or switch to more stable substitutes.[25] This, coupled with the possible tendency for instability to reduce investment in the production of the affected export commodities, is likely to be a main contributor to the often reported tendency for LDC exports to stagnate or grow very sluggishly.[26] A study by Glezakos revealed that export instability, particularly with respect to price, has a very significant negative relationship with the growth of exports.[27]

Voivodas studying the impact of foreign exchange instability on economic growth of the LDCs has found that change in export receipts is "positively and significantly related to the rate of growth in output," and that export instability has a "significantly negative effect on the rate of growth of primary producing countries."[28] These findings concur with those of Glezakos who estimated in 1973 that for his sample of countries, export instability was responsible for a fourth of the observed variation in the income growth rates of the LDCs.[29]

This effect of instability on LDCs' economic growth comes about via the balance of payments (BOP). A United Nations committee of experts reported in 1961 that because of fluctuations in their export proceeds, the LDCs are unusually vulnerable to BOP problems.[30] Given

the importance of foreign trade in many LDC economies, instability in export earnings translates into instability in investment and even domestic consumption. This is felt most seriously during recessions in the DCs which depresses their demand for the LDC imports. This combines with the tendency for instability to cause stagnation or even decline in export volumes and result in deteriorating TOT of the LDCs. The resulting decline in the volume and purchasing power of exports could cause LDCs to have to reduce their imports of investment and consumption goods, probably in that order, leading in turn to failure by these countries to fulfill their economic and social development objectives.[31] This eventuality is particularly imminent since, as Hawkins et al. pointed out, LDCs' international reserves are limited and at the same time foreign aid and investment are not likely to compensate for the shortfall in export earnings.[32] The particular vulnerability of LDC economies to this BOP connection of the export instability problem is further elaborated by Brook et al.,[33] who also note that:

> Given that factor mobility is limited in most developing countries, they normally suffer from either cause (export revenue shortfall or boom) of external imbalance.

In an attempt to forestall or mitigate these BOP related problems, countries plagued with export instability have to hold Foreign Exchange reserves and/or borrow enough to be able to ride fairly smoothly through export fluctuations. The cost of holding such reserves, including the foregone developmental investment opportunities (these are particularly high for a poor LDC like Tanzania), plus/or the interest and other service charges on foreign borrowings, constitute one of the

most grievous costs of export instability.[34]

In the event of serious BOP problems governments find themselves having to resort to strict import controls, allowing in only essentials such as medical supplies and essential food stuffs. Under any such controls, capital and other investment goods imports are likely to suffer leading to the under-utilization of existing industrial capacity and suspension of new investments. Kenen and Voivodas[35] find an inverse relationship between export instability and the level of investment.

As demonstrated earlier with regard to Tanzania, many LDC governments rely heavily on taxes and other charges levied on exports and imports. When these are interrupted due to export instability, these governments fail to raise enough revenues to continue development investments and social services. When a government is faced with having to choose between long-term development investments and short-term survival needs, it is anybody's guess that the earlier will stand to loose. In this sense, therefore, export instability will tend to limit the "economic horizon" and destroy the "sense of continuity so necessary in private as well as public planning."[36] It may be worth mentioning here that the Tanzania government, for example, had to delay the commencement of its third five year development plan by a whole year during 1974/75 due, in part, to foreign exchange problems in 1974.

Kitomura and Yang call attention to the fact that fluctuations in primary export markets

> subject the domestic cost of living and money wages of the exporting country to wide fluctuations. As a result, investment in non-export sectors of the exporting country's economy is unstable and subject to uncertainty.[37]

the importance of foreign trade in many LDC economies, instability in export earnings translates into instability in investment and even domestic consumption. This is felt most seriously during recessions in the DCs which depresses their demand for the LDC imports. This combines with the tendency for instability to cause stagnation or even decline in export volumes and result in deteriorating TOT of the LDCs. The resulting decline in the volume and purchasing power of exports could cause LDCs to have to reduce their imports of investment and consumption goods, probably in that order, leading in turn to failure by these countries to fulfill their economic and social development objectives.[31] This eventuality is particularly imminent since, as Hawkins et al. pointed out, LDCs' international reserves are limited and at the same time foreign aid and investment are not likely to compensate for the shortfall in export earnings.[32] The particular vulnerability of LDC economies to this BOP connection of the export instability problem is further elaborated by Brook et al.,[33] who also note that:

> Given that factor mobility is limited in most developing countries, they normally suffer from either cause (export revenue shortfall or boom) of external imbalance.

In an attempt to forestall or mitigate these BOP related problems, countries plagued with export instability have to hold Foreign Exchange reserves and/or borrow enough to be able to ride fairly smoothly through export fluctuations. The cost of holding such reserves including the foregone developmental investment opportunities (these are particularly high for a poor LDC like Tanzania), plus/or the interest and other service charges on foreign borrowings, constitute one of the

most grievous costs of export instability.[34]

In the event of serious BOP problems governments find themselves having to resort to strict import controls, allowing in only essentials such as medical supplies and essential food stuffs. Under any such controls, capital and other investment goods imports are likely to suffer leading to the under-utilization of existing industrial capacity and suspension of new investments. Kenen and Voivodas[35] find an inverse relationship between export instability and the level of investment.

As demonstrated earlier with regard to Tanzania, many LDC governments rely heavily on taxes and other charges levied on exports and imports. When these are interrupted due to export instability, these governments fail to raise enough revenues to continue development investments and social services. When a government is faced with having to choose between long-term development investments and short-term survival needs, it is anybody's guess that the earlier will stand to loose. In this sense, therefore, export instability will tend to limit the "economic horizon" and destroy the "sense of continuity so necessary in private as well as public planning."[36] It may be worth mentioning here that the Tanzania government, for example, had to delay the commencement of its third five year development plan by a whole year during 1974/75 due, in part, to foreign exchange problems in 1974.

Kitomura and Yang call attention to the fact that fluctuations in primary export markets

> subject the domestic cost of living and money wages of the exporting country to wide fluctuations. As a result, investment in non-export sectors of the exporting country's economy is unstable and subject to uncertainty.[37]

Export instability also tends to fuel domestic inflationary pressures in the LDCs via the BOP connection, a la Brook et al., and through a ratchet effect, LDC export instability tends to produce inflationary pressures in the DCs,[38] inflation which is imported back into the LDCs via their imports. It has also been argued that price stability is likely to result in a steady demand and flow of savings in LDCs.[39] To the extent that this assertion is true, export market stability may be expected to yield steadier growth in investment, income and employment.

Finally, export market stability is likely to lead to greater efficiency in the allocation of resources. Kafka has argued that export instability tends to lead to inefficiencies in the use of resources especially when there are lags involved in producer and consumer responses to price changes.[40] This view is also shared by Brook et al. who points out that price instability often causes unjustified investment booms during periods of high prices and under-investments during periods of low prices.[41] This is a basic characteristic of tree crop production and coffee is a classic example. Market stabilization is not only likely to mitigate the staggering losses and stocks management problems that often plague these commodity markets, it would also make it easier to plan production thus making it possible to produce at close to minimum average cost.[42]

Nurkse has argued that violent export instability serves to fuel speculative attitudes and "get-rich-quick" mentality amongst LDC businessmen with the consequences of impairing steady development

policies.[43] Knudsen and Parnes contend, on the contrary, that this "get-rich-quick" mentality is good for a country's development since it could induce investments that would not have otherwise occurred.[44] "The possibility of high returns," they argue, "could induce investment in projects with high uncertainty even when the expected return is lower than that of more certain projects." They cite the purchase of sweepstakes tickets and participation in lotteries as exemplary of this type of behavior among economic agents. In addition they point out that the uncertainty created by instability could induce added savings in the form of reserves put aside to facilitate smooth riding through any adverse turn of events. Finally, Kudsen and Parnes show that, to the extent that Friedman's permanent income theory of consumption[45] applies for LDC export earnings, higher export instability results in higher savings ratios.[46] They then proceed to show empirically that export instability is positively related to economic growth.

MacBean finds a positive correlation between export instability and fixed capital formation.[47] These results agree with Caine's observation that high levels of investment prevailed in Malaysia and Indonesia during periods of very sharp fluctuations of prices of these countries' exports.[48] Caine asserts further that both agricultural and mineral investments have grown in spite of market fluctuations in their export markets. He explains this apparent behavior of investors to their having a long-term view which accomodates short-term fluctuations, and therefore are not turned away by such fluctuations. He does admit however that export instability hurts government

investments although he attributes this to wrong government policy rather than misgivings in the market.

Singh has reported that a World Bank study has shown that for LDCs with exports growth rates of 6 per cent or more, export instability is of no major consequence to their GDP growth. However, for LDCs with exports growing at lower rates, export instability represents a major handicap.[49] This sounds a note of caution against unwarranted overgeneralizations of any results on this problem. Michalopoulos and Perez, otherwise proponents of stabilization measures for LDCs at the international level, express wonder whether it would be prudent to "fully compensate LDC exporters for fluctuations since fluctuation is one of the forces which encourage diversification of production structure quite necessary for success in development in the long-run."[50]

When all is considered -- the evidence against the existence of the problem, the extent of its gravity and even the sounded caution against overgeneralization, it would appear that the evidence in support of the need for action to contain the instability problem is overwhelming, although extra-care is required in solution policy formation to properly line-up tools, prevailing circumstances and the desired goals.

The Trend Problem: The Effects Controversy

The case for deteriorating TOT for primary products of the LDCs is mainly built around the tendency for these products or countries' exports to grow very sluggishly. This, Singh argues, is the more serious

of the two issue areas of the commodity problem amongst non-oil primary exporters. He reports that during 1955-72 world trade rose by 7.3 per cent annually, while trade in the non-fuel primary products grew at 5.2 per cent for food products, and raw materials in general rose 4.2 per cent. LDC food exports grew at -3.2 per cent annually while their non-oil raw materials grew at 3.8 per cent.[51]

This sluggishness in the growth of primary and LDC exports is believed to originate from:

(i) Technological advancement which:

a) leads to increased production of synthetic substitutes,

b) leads to raw materials being a small per cent of the components of finished goods; and

c) tends to flourish and benefit the DCs, e.g., by making it possible to produce goods previously only produced in the LDCs, thus tending to increase competition and lowering prices.

(ii) Subsidies and protectionism in the DCs[52] tending to close off certain markets to the LDCs' exports.

(iii) Low values of the various elasticities[53] acting to depress volumes of primary commodity exports.

This sluggish long-term growth in primary commodity exports is often accompanied by a decline in the price of these exports relative to other commodities.[54] To the extent that this is the case, the TOT for the primary products is almost sure to fall relative to other products.

The low elasticities basis of the TOT argument has been brought to question by Porter who in a study covering the post-World War II period

concluded that "the demand for primary products typically may be very price-inelastic or very income-inelastic, but the common belief that it is both price-inelastic and income-inelastic is not supported by data."[55] Porter confirms the heterogeneity of the TOT pointing out that in broad terms LDC TOT during the late 1950's had worsened relative to the early 1950's, improved relative to the mid-1930's and remained about the same relative to the 1920's. More recent analyses[56] have tended to confirm the heterogeneous nature of these TOT.

It is clear from this review that whereas the commodity problem may present a serious threat to a particular economy or industry during a certain period of time, there has been a tendency of over-generalization both on the proponents' and detractors' side of the problem. For a clearer picture of the reality, one will need to heed Morgan's advice and "look hard to the particular ad hoc influences that for a particular commodity, country, and time are relevant."

The Outlook of a Free Market for Coffee

Coffee has been described as a "problem commodity"[57] because of:

(i) the heavy dependence of its producing countries' economies on the commodity;

(ii) the biological lag entailed in its supply response to price changes;

(iii) the cost structure of production in which most of the costs are fixed and variable costs are very light;

(iv) the large share of the market held by Brazil and the effects of frosts in that country;

(v) market uncertainty and speculative behavior.

Coffee is produced in all continents of the world except Europe. In all about 70 countries and territories, almost exclusively LDCs, produce significant quantities of coffee and among them about 50 are net exporters. About 20 per cent of world production is consumed within the producing countries and the balance is exported. Of the volume exported, about 90 per cent is exported to the DCs.[58] As text Table 10 shows, export earnings from coffee accounted for over 50 per cent of the Foreign Exchange earnings of six exporting countries, over 30 per cent of these earnings for 12 countries, and over 25 per cent for 20 countries during 1970-77. Given this heavy reliance on coffee most, if not all, of these countries are constantly under temptation to expand their coffee production and exports. Needless to say, this temptation is reinforced whenever there is a major price hike as was the case during the early 1950's[59] and during much of the 1970's, both of which periods have experienced a considerable amount of expanded production.

The production process of coffee entails an uncertain biological time lag.[60] Typically a considerable increase in price causes growers to step-up cultural practices such as the application of fertilizer and pesticides in their coffee farms. This causes production to increase modestly during the following season. If the price remains high, growers are likely to undertake fresh plantings of coffee. The coffee tree takes two to four years from planting to yield its first crop; it does not attain its normal production until two years later. Its productivity remains stable until about the fifteenth year when it

TABLE 10

COFFEE EXPORT EARNINGS AS PERCENTAGE OF TOTAL EXPORT RECEIPTS OF THE COUNTRIES MOST DEPENDENT ON COFFEE AND TANZANIA: 1970-74.

	1970	1971	1972	1973	1974
Burundi	84.4	79.7	84.7	86.0	84.3
Uganda	57.7	58.7	60.9	67.6	73.3
Colombia	64.2	57.4	49.8	50.9	44.1
Rwanda	56.5	49.2	42.9	89.2	60.2
Ethiopia	61.6	56.6	48.0	38.3	27.7
Haiti	37.6	39.3	37.1	40.2	33.6
El Salvador	49.4	40.6	38.6	na	na
Guatemala	35.4	34.6	32.7	33.6	na
Ivory Coast	34.6	34.7	27.3	23.7	22.7
Angola	31.9	33.2	37.6	26.9	20.1
Costa Rica	31.6	26.3	27.7	27.3	28.3
Brazil	35.9	28.3	26.5	21.7	12.3
Kenya	31.1	26.7	27.4	29.2	23.6
Madagascar	27.2	26.5	27.8	29.7	26.7
Cameroun	23.5	25.5	27.7	25.9	25.1
Tanzania	18.5	13.1	18.9	22.1	14.8

Note: na = not available.

Source: Calculated from the U.N., Yearbook of International Trade Statistics, (New York: United Nations, 1974, 1975, and 1976)

begins to taper off although with good management, the decline is very gradual and a tree may produce economically for up to 50 years.[61] This is to say that it takes up to six years for an investment (planting) decision made in response to a price change, to exert its full impact on the supply of coffee in the market and given the time it takes between a price change and the decision to plant, the lag could increase considerably. The consequences of this stretched lag is that supply, when it does reach the market, tends to over shoot the price mark that triggered it six years before -- thus starting a downturn in prices.

The problems emanating from the time lag characterizing the coffee production process is further compounded by the cost structure of that process.[62] This structure is such that by the time coffee comes into production most production costs including land rent, capital (trees and equipment), labor and other costs incurred from the time the decision to plant was made, are fixed. Hereafter the variable costs, mainly labor costs, are very low in most producing areas, particularly where production is at the smallholder scale. This means that producers will find it paying to continue to produce even when prices are extremely low, as long as they can cover the said low variable costs. Consequently, the fall in price triggered by supply having over-shot the price mark that started the adjustment process years before, continues for a long time before it has a significant influence on the supply, unless some exogenous factor intervenes and drastically changes the actual or expected supply position.

Some of these exogenous factors, including weather conditions and competition from other commodities for growers' resources, are discussed in Chapter 4.

This is partly the reason why price elasticities of supply for coffee have often been found to be very low especially in the short and medium term. De Vries has estimated that these elasticities vary from 0.03 to 0.20, 0.14 to 0.46, and 0.40 to 10.7 in the short-term (one year lag), medium-term (seven years lag) and long-term (full adaptation).[63] These elasticity estimates are reproduced in text Table 11.

TABLE 11

PRICE ELASTICITIES OF SUPPLY FOR COFFEE BY PRODUCING AREAS

	Short-term (1 year lag)	Medium-term (7 years lag)	Long-term (full adaptation)
Brazil	0.20	0.44	0.66
Colombia	0.03	0.18	0.40
Other South America	0.06	0.46	10.70
North, Central America and the Carribean	0.03	0.14	0.77
Africa	0.12	0.44	1.87
Asia	0.10	0.43	3.01

Source: Singh, et al. Coffee, Tea and Cocoa: Marketing Prospects and Development Lending, (Baltimore: Johns Hopkins, 1975) p. 31, Table 3.

These elasticities are evidently low, especially in the short and medium-terms. This ties in well with the lag behavior of production

discussed above -- in the short-term only modest supply response to price variations may be forthcoming, in the medium-term response increases as crops from the newly planted coffee enter the picture, and in the long-term when the full impact of these new plantings is felt in the market. It is also evident in text Table 11 that these elasticities vary in magnitudes between countries and regions. These differences tend to be inversely related to the area or country's degree of dependence on the commodity, and directly with the dominant size of production units.[64] The Food and Agriculture Organization reports that about two thirds of the world's coffee is produced in small to medium size farms (from less than two hectares for smallholders to about 30 hectares in medium size production units).[65] This, coupled with the heavy economic reliance of producing countries and enterprises (the large majority of which are small-scale peasant producers) on the commodity, one would expect the overall world supply elasticities to be on the lower side of the scale shown in text Table 11. The consequence of these low elasticity values is that supply response fails to exert a quick stabilizing influence in the market.

This problem is particularly aggravated by the fact that the most important exogenous intervening force in the world coffee market, especially in recent years, has been Brazilian frosts. The importance of this factor stems from the fact that Brazil alone accounts for well over 30 per cent (85 per cent in 1906/07) of the world's coffee output. The frequence of these frosts has increased considerably in recent years as shown in text Table 12.

Some of these exogenous factors, including weather conditions and competition from other commodities for growers' resources, are discussed in Chapter 4.

This is partly the reason why price elasticities of supply for coffee have often been found to be very low especially in the short and medium term. De Vries has estimated that these elasticities vary from 0.03 to 0.20, 0.14 to 0.46, and 0.40 to 10.7 in the short-term (one year lag), medium-term (seven years lag) and long-term (full adaptation).[63] These elasticity estimates are reproduced in text Table 11.

TABLE 11

PRICE ELASTICITIES OF SUPPLY FOR COFFEE BY PRODUCING AREAS

	Short-term (1 year lag)	Medium-term (7 years lag)	Long-term (full adaptation)
Brazil	0.20	0.44	0.66
Colombia	0.03	0.18	0.40
Other South America	0.06	0.46	10.70
North, Central America and the Carribean	0.03	0.14	0.77
Africa	0.12	0.44	1.87
Asia	0.10	0.43	3.01

Source: Singh, et al. Coffee, Tea and Cocoa: Marketing Prospects and Development Lending, (Baltimore: Johns Hopkins, 1975) p. 31, Table 3.

These elasticities are evidently low, especially in the short and medium-terms. This ties in well with the lag behavior of production

discussed above -- in the short-term only modest supply response to price variations may be forthcoming, in the medium-term response increases as crops from the newly planted coffee enter the picture, and in the long-term when the full impact of these new plantings is felt in the market. It is also evident in text Table 11 that these elasticities vary in magnitudes between countries and regions. These differences tend to be inversely related to the area or country's degree of dependence on the commodity, and directly with the dominant size of production units.[64] The Food and Agriculture Organization reports that about two thirds of the world's coffee is produced in small to medium size farms (from less than two hectares for smallholders to about 30 hectares in medium size production units).[65] This, coupled with the heavy economic reliance of producing countries and enterprises (the large majority of which are small-scale peasant producers) on the commodity, one would expect the overall world supply elasticities to be on the lower side of the scale shown in text Table 11. The consequence of these low elasticity values is that supply response fails to exert a quick stabilizing influence in the market.

This problem is particularly aggravated by the fact that the most important exogenous intervening force in the world coffee market, especially in recent years, has been Brazilian frosts. The importance of this factor stems from the fact that Brazil alone accounts for well over 30 per cent (85 per cent in 1906/07) of the world's coffee output. The frequence of these frosts has increased considerably in recent years as shown in text Table 12.

TABLE 12

THE FREQUENCY OF SERIOUS BRAZILIAN FROSTS: 1869/70 TO 1974/75

Frost Years	Number of Years from Previous Frost
1869/70	na
1901/02	32
1917/18	16
1941/42	24
1942/43	1
1952/53	10
1962/63	10
1968/69	6
1971/72	3
1974/75	3

Note: na = not available.

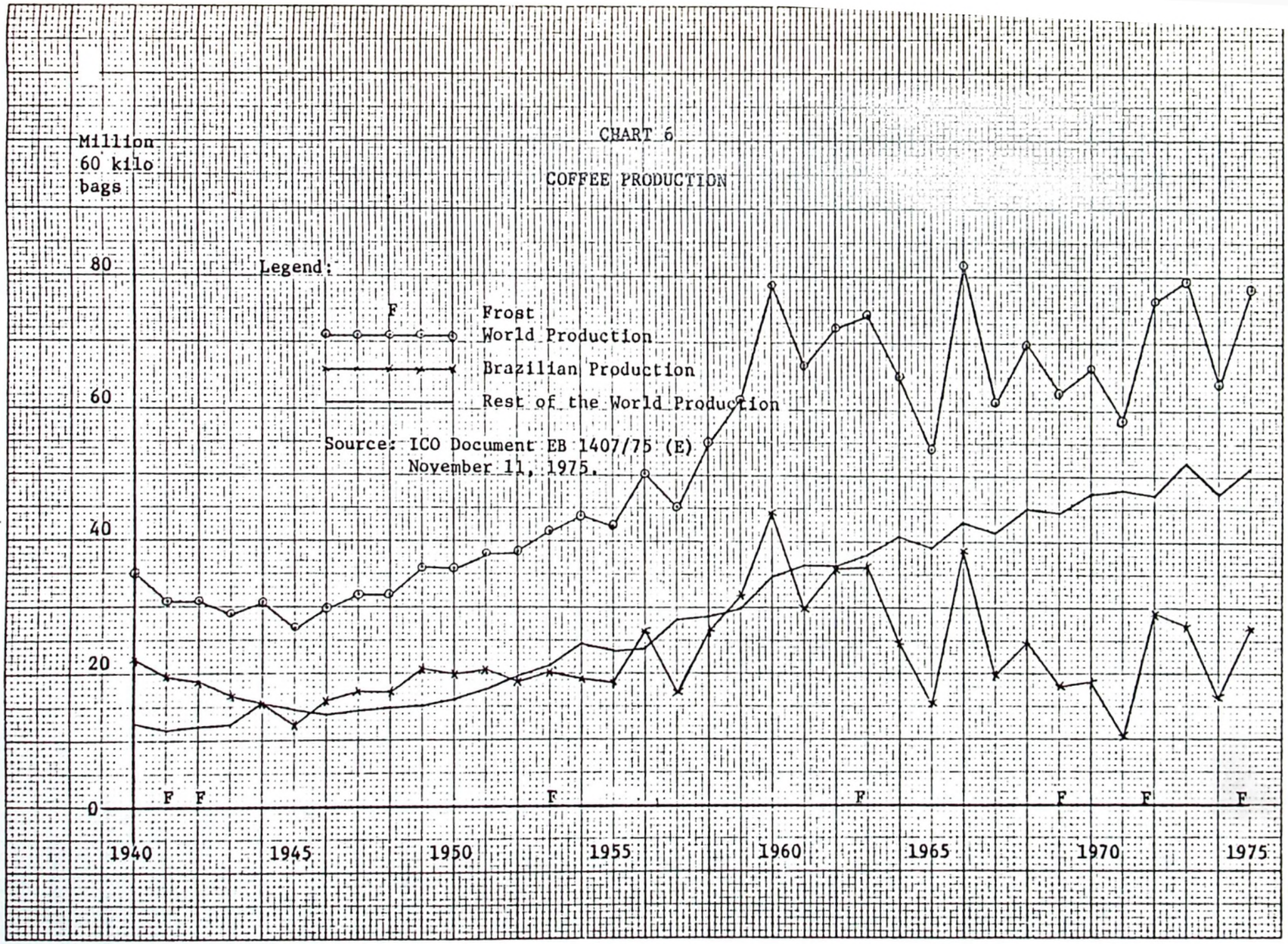
Source: Long Term Historical Data on Production, Stocks, Exprots and Prices of Coffee, ICO Document EB 1407/75 (E), (London: International Coffee Agreement, November 11, 1975) Table 1.

This increase in the frequency of serious frosts is partly explainable by the emergence in recent years of Parana Region, the region most prone to frosts, as the most important coffee producing area in Brazil. Rourke reports that Parana's share of Brazil's crop increased from about 10 per cent during 1945/46 to 1949/50, to nearly 50 per cent during 1960/61 to 1964/65.[66]

As is seen in Chart 6, Brazil's production because of that country's large world market share, has a very significant influence on trends in the world market. Since that country's production is

CHART 6

COFFEE PRODUCTION



Source: ICO Document EB 1407/75 (E)
November 11, 1975.

TABLE 12

THE FREQUENCY OF SERIOUS BRAZILIAN FROSTS: 1869/70 TO 1974/75

Frost Years	Number of Years from Previous Frost
1869/70	na
1901/02	32
1917/18	16
1941/42	24
1942/43	1
1952/53	10
1962/63	10
1968/69	6
1971/72	3
1974/75	3

Note: na = not available.

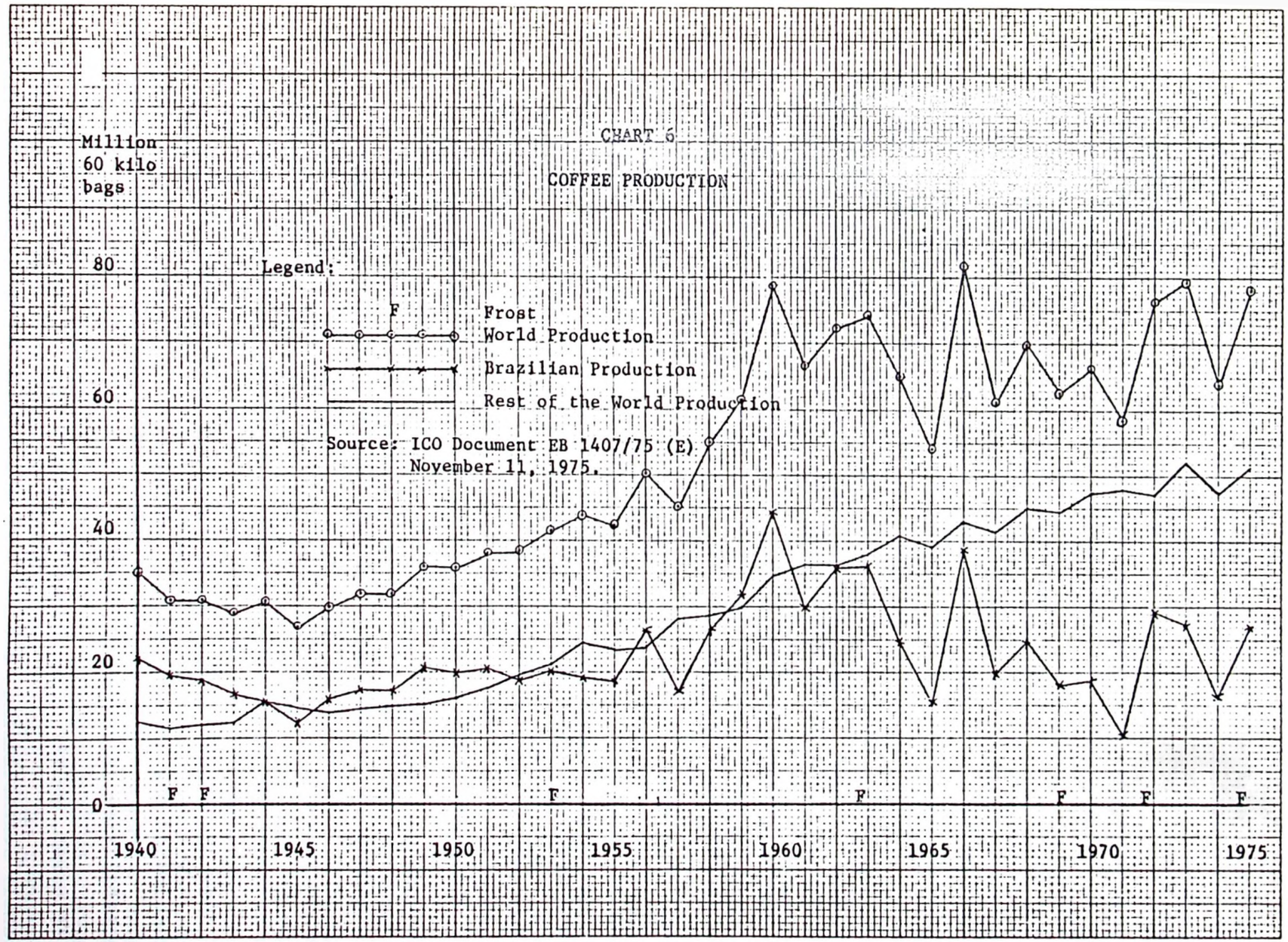
Source: Long Term Historical Data on Production, Stocks, Exprots and Prices of Coffee, ICO Document EB 1407/75 (E), (London: International Coffee Agreement, November 11, 1975) Table 1.

This increase in the frequency of serious frosts is partly explainable by the emergence in recent years of Parana Region, the region most prone to frosts, as the most important coffee producing area in Brazil. Rourke reports that Parana's share of Brazil's crop increased from about 10 per cent during 1945/46 to 1949/50, to nearly 50 per cent during 1960/61 to 1964/65.[66]

As is seen in Chart 6, Brazil's production because of that country's large world market share, has a very significant influence on trends in the world market. Since that country's production is

CHART 6

COFFEE PRODUCTION



inherently unstable, this marked influence translates into an overall destabilization of the entire world coffee market. The tendency for frosts to aggrevate this destabilizing influence is also clear from the chart.

A further factor that influences trends and stability in the world coffee market is the speculative behavior of the actors in that market. Hopp and Foote have argued that while it is supply and demand factors for coffee that have the most significant effect on coffee price changes, this speculative behavior accentuates these changes. Their analysis showed that on average, prices were 21 per cent higher during inflationary periods (periods of rising prices) than would be expected from their regression equation (i.e. justified by the supply and demand situation) and 11 per cent lower when prices were falling.[67] The rationale for this, they argue is that during periods of tight supplies and rising prices, roasters, uncertain of future supply and demand conditions, and fearing the possibility of being unable to obtain adequate volumes of their desired quality coffees, tend to bid up prices to levels higher than the existing supply and demand situation warrants. Similarly when there are ample supplies, buyers bring pressure on sellers and succeed in depressing prices to levels lower than justified by the ruling supply and demand conditions. The conclusion one draws from this tendency is that speculative behavior is destabilizing in coffee markets.

Friedman, on the other hand, has argued that if speculation was inherently destabilizing, speculators would lose money and be out of

business.[68] Baumol[69] agrees that speculation does have a stabilizing element in that speculators by selling when prices are high (higher than the price at which they bought the commodity in question, if they are to make a profit) depresses the price and when they buy at low prices, they help bid up the price. He notes, however, that "speculation must also have a destabilizing influence in accelerating both upward and downward movements in prices since speculative sales occur when prices are falling and purchases occur when prices have begun to rise." He then proceeds to demonstrate that speculation, whether profitable (to the speculator) or otherwise, tends to increase the frequency of fluctuations and may also increase the amplitude of these fluctuations.

Trends in the world consumption of coffee are not encouraging to producers. In the United States, the world's largest consuming nation, consumption has been declining since the beginning of the 1960's. This trend is particularly marked amongst the youth, implying that the chances of a future reversal of this trend are very bleak. The statistics in text Table 13 elaborate this trend.

In the producing countries of Africa and Asia, where coffee consumption is just beginning to grow, the income elasticities of demand are low and are likely to grow as incomes grow and the coffee drinking habit becomes more entrenched. In the more established and/or economically stronger producing countries such as Brazil, however, coffee drinking is well established and given such countries' considerably higher levels of income, it is likely that the income elasticities of demand will tend to decline as incomes grow further. The reverse of

TABLE 13

U.S. COFFEE CONSUMPTION BY AGE GROUPS

Age Group	Cups per person per day			Per cent Change		
	1954	1962	1974	1954-62	1962-74	1954-74
10-14	0.21	0.18	0.11	-14.3	-38.9	-47.6
15-19	1.12	1.09	0.46	- 2.7	-57.8	-58.9
20-24	2.52	2.99	1.35	+18.7	-54.8	-46.4
25-29	3.02	3.88	2.70	+28.5	-30.4	-10.6
30-39	3.40	4.50	3.02	+32.3	-32.9	-11.2
40-49	3.29	4.44	3.68	+34.5	-17.1	+11.9
50-59	2.95	3.83	3.49	+29.8	- 8.9	+18.3
60-69	2.46[a]	3.01	2.72	+22.4	- 9.6	+10.6
70+	na	2.39	2.22	-	- 7.1	-

Notes: a = Includes all persons aged 60 and older.

na = Not available.

Source: N.A. Lawrence, W.H. Phillips, A.H. Riffkin, and A.A. Saleh, U.S. Coffee Consumption 1946-76, FAS M-275, (Washington, D.C.: Foreign Agricultural Service, U.S. Department of Agriculture, February 1977), p. 11.

this is true with price elasticities of demand for the commodity both with regard to their likely absolute values and trends over time, and with increasing price levels. Based on these observations, de Vries concludes that both price and income elasticities of demand are constant in the producing countries generally. As regards the situation in the importing countries, he argues that the income elasticities of demand for coffee may be assumed to be declining as these countries' incomes increase because the consumption of coffee is approaching saturation in most of these countries.[70]

Parikh[71] agrees with other students of the issue that, in the United States income plays a negligible role in determining coffee consumption. This, he argues, is because the saturation level in coffee consumption has been reached in this country. But as regards the situation and prospects elsewhere he is less pessimistic than de Vries. He believes that in Europe coffee consumption has not reached the saturation point and points out that growth in coffee imports have exceeded growth in population thus indicating an increase in the per capita consumption of coffee. He attributes the improvement in consumption to growth in incomes, decline in relative coffee prices and a trend effect. He also believes that consumption in other countries is growing for the same reasons as well as growth in population.

While coffee seems to be losing ground in Northern Europe, it appears to be gaining the upper hand from tea in Britain. The British Ministry of Agriculture, Fisheries and Food reports that coffee consumption per capita has grown from 1.3 to 1.5 lbs. of green coffee

per capita during 1955 to 1973.[72] In Japan growth in consumption has just begun and there it is mainly the youth who are taking to coffee drinking,[73] implying that the future is promising assuming that the trend continues as the young coffee drinking population grows into adulthood. In the socialist countries of Eastern Europe and Asia coffee consumption is held down by strict foreign exchange controls and prohibitive taxes against the commodity.

In the way of a summary, it appears that left alone, the coffee market is not headed for stability and improvement of trends in the earnings of producing countries. Producing countries are led by their economic aspirations for accelerated advancement to yield to temptations of possible added gains to be made by expanding production, the consequences of which is to flood the market and dampen prices. The time lag and cost structures characteristic of coffee production lead to inability of supply to adjust quickly to market signals. This results in extended market imbalance between supply and demand. Added to this, the dominant and destabilizing influence of Brazilian production, by increasing uncertainties of future supplies, tends to fuel speculative market behavior and further destabilize the market. All these factors in combination with the not-so-promising consumption trends, tend to lead one to suspect that a free market for coffee will not deliver the stability and improved trends in earnings that producing countries crave for. It is, therefore, prudent that we look into the potentials of international market intervention in bringing about these desired goals. This is our next task.

International Commodity Agreements: What Hope for the Commodity Problem?

It has been pointed out that the most important reason why many DCs, the U.S. in particular, do not come out strongly in support of price stabilizing international commodity agreements is that while those agreements are originally set up to stabilize prices "they have invariably tended to shift emphasis in practice to raise prices over what the long-term trend would have been."[74] Pincus has referred to price stabilization objectives in commodity agreements as "smoke-screens" for higher, or at least unfalling commodity prices.[75] However, this claimed shift in emphasis should not have come as a surprise since as Frank has pointed out, of the two problem areas that form the commodity problem, "the adverse long-term trends in commodity markets is the more fundamental."[76]

Michalopoulos has argued that it might well be that the DCs are the chief beneficiaries of commodity price stabilization.[77] It is, therefore, not unexpected that the DCs and LDCs would find common ground in commodity agreements to stabilize prices. However, LDCs upon realizing a tendency toward their losses in income resulting from sluggish growth or even net decline in demand for their primary commodity exports, are inclined to seek stabilization measures that also help maintain or if possible increase their export earnings, and these measures include raising prices by restricting market supplies. Many DCs, on the other hand, are against any efforts, explicit or implicit, to raise prices or change their long-term trends.

Such initiatives, the DCs argue, while probably beneficial to the exporting countries, can only be realized at importers' expense.[78] It is probably in fear of this potential conflict and the need to maintain working rapport in the relevant LDC/DC negotiations that many international stabilization proposals, including UNCTAD's Integrated Program, address themselves to price rather than revenue stabilization even though they recognize that LDCs are primarily interested in stabilizing revenues.[79]

The International Coffee Agreements, at least the 1962 and 1968 versions, appear to have had the intention of dealing with both instability and adverse long-term trends. The specifics of the relevant provisions will be discussed in a later chapter, but in the meantime it is worth noting that even a stabilization per se type international commodity agreement could under certain conditions yield improved trends in prices and export earnings.

As maintained earlier, marked stabilization for a particular commodity tends to discourage the development of a shift to substitutes of that product. Stabilization also avoids the tendency for producers to over-react to temporary or speculative increases in demand and prices by over investing in production capacity which comes into production when demand has subsided thus serving to dampen prices and earnings. These considerations, argues Johnson, provide cause for "maintaining that price stabilization, ..., might contribute more to stabilization of and an increase in export earnings of less developed countries than MacBean's statistical evidence might suggest."[80] Behrman argues and, using a graphic schema similar to

that used by Brook et al. to which reference was made earlier, demonstrates that where a commodity market is predominantly characterized by supply shifts, price stabilization increases producers' revenues. This assertion is contrary to views held by some economists that there is generally a trade-off between price stability and increased revenues.[81] These bleak views on stabilization, Behrman argues, are based on "certain critical assumptions -- such as high price responsiveness for suppliers and users or shifts in underlying response relations -- that do not seem justified by existing empirical evidence." He proceeds to demonstrate that where both demand and supply schedules are sufficiently inelastic in their relevant ranges, price stabilization also stabilizes and increases producers' revenues. He contends further that exporters of a commodity may prefer stability even where it results in greater instability of revenues as is likely to happen if the market is characterized by supply shifts, or reduced revenues which stabilization may cause in markets where both supply and demand schedules are price elastic and demand shifts are predominant, if such stabilization forestalls loss of market to substitutes that tends to result from excessive instability.[82] In this case what appears as loss of income in the short-run, translates into increased total earnings from a long-run perspective. These benefits are in addition to reduced economic management and planning problems that result from greater stability.

Pincus warns that the conclusion and signing of international agreements "is no guarantee of high prices, high export earnings or favorable effects on economic development. For the agreement to work

effectively as agents of development goals, several conditions are required in addition to inelastic long-run demand."[83]

i) Effective provisions for control of over supply (both with respect to production and exports not export alone, lest the agreement succumbs to pressures for breaking up that tend to build up with increasing stocks);

ii) Effective capacity by governments to channel increased earnings into economic development rather than into higher profits for growers, to prevent the use of such increases for non-developmental purposes or repatriation by expatriate producers;

iii) A world market organization for the commodity in question in which one or two producing countries dominate world supply and these dominant producing countries' willingness to practice restraint in the face of supply control violations by the smaller producers;

iv) A large number of producing countries to assure a wide distribution of gains from the agreements. However, a commodity agreement that results in increased prices will be very difficult to organize for a commodity with a world wide production, such as rice, since it would lead to increased self-sufficiency and reduced trade.

v) Agreement to limit domestic production in those importing countries that can or do produce the commodity and all importing countries' willingness to police compliance by exporting countries of the export restrictions set by the commodity agreement.

We should add to this list the requirement that the commodity, subject of the agreement, be free from close substitutes, natural or synthetic, and account for a relatively small proportion of the consumer's budget. These additional requirements are implied in the elasticity criteria and in some of the other listed conditions.

The World Coffee Market: Aptness for International Commodity Agreement

As may be deduced from the discussion this far, coffee does not lend itself well to production controls. The biological time lag entailed in its production, coupled with the structure of its production costs and the heavy dependence on many of the commodity's producing nations, greatly limit the flexibility with which decisions may be made while at the same time increasing the stakes of control decisions to individual economies. For an economy as heavily dependent on coffee as Burundi (see text Table 9), a decision to cut down production or hold back stocks when the country knows it can sell, is a very difficult and costly decision. As mentioned earlier with respect to newly planted coffee, by the time coffee trees come to produce a crop, most of the costs of production are fixed; therefore, a decision to stop production causes a tremendous loss to producers. The fact that coffee is produced by two to three million farming enterprises, a large proportion of which are smallholdings of less than two hectares each, scattered in some 70 countries of the world,[84] makes any production control efforts physically prohibiting.

Most coffee producing countries market their coffee through central, usually government controlled agencies. Given the political will, tact and plain guts in countries where growers wield considerable political power, as well as the ability to control contraband and other illegal ways by which coffee might be exported, channeling increased coffee earnings to development activities should not prove insurmountable

Between 1970 and 1973 Brazil and Columbia alone accounted for about 33 per cent of the world's exportable coffee production. These two countries together with the Ivory Coast and Angola accounted for 48 per cent of exportable production over the same period of time. The remaining share of production is rather thinly distributed among nearly fifty other countries. There is very little production in the importing countries (mostly DCs), and the probability of this production capacity ever building up to a point where it poses a threat to the exporting countries is virtually nil.

As mentioned earlier, coffee consumption trends are not encouraging. In some countries, particularly the United States, consumption per capita is actually declining. While it is true that cold drinks consumption is gaining ground at the same time as coffee appears to be losing ground, it is difficult to establish a causal relationship between these two apparent trends. The loss of ground for coffee, at least in the U.S., appears to be more a consequence of changes in the life-style than due to relative prices or availability between coffee and cold drinks. A United States Department of Agriculture study attempting to explain the cause of declining regular coffee consumption per capita over 1946-75 revealed that "cool beverages

such as soft drinks are a life-style substitute rather than a price competitor (of coffee)." The study, therefore, went on to conclude that the "consumption of regular coffee can be viewed as being not directly influenced by the consumption of soft drinks."[85]

It has also been indicated earlier that both the price and income elasticities of demand for coffee are low, especially with respect to modest price changes. The aforesaid U.S.D.A. study revealed that because coffee is a habitual drink in the U.S. and accounts for a very small part of the consumer's budget, "he or she has not substantially reduced consumption when coffee prices rose." As may be seen in text Table 14, this small share of coffee in the U.S. consumer's budget has been falling since the early 1950's.

The price elasticities of supply for coffee have been shown to be very low in the short- and medium-term (see text Table 11). In the long run, however, the supply elasticities tend to become quite substantial but since the implied supply response is so far separated from the investment decision (beyond 7 years according to de Vries - text Table 11), one would hope that, if the producing country so desired, it could prepare itself to cope with the impending problem.

From this discussion it appears that coffee comes out quite well with respect to all criteria of aptness for a market stabilization agreement except as regards production controlability. However, if parties to the agreement adhere to the provisions of the agreement, autonomous market forces will bring about the needed production control effects as more efficient (low cost) producing members enlarge their market shares at the expense of the less efficient producers. The 1976

TABLE 14

U.S. REGULAR COFFEE PRICES AND CONSUMERS' INCOME:
SELECTED YEARS: 1946-1975

Year	Per capita disposable income ($)	Retail Regular Coffee Price		Real per Capita Disposable Income (deflated by CPI)	Real Regular Coffee Price	
		Cents per lb.	As % of per capita disposable income (%)		Cents per lb. (deflated by FPI)	As % of Real Per Capita disposable income
1946	1,132	34.4	3.0	1,935	59.2	3.1
1948	1,290	51.4	4.0	1,789	67.1	3.8
1950	1,364	79.4	5.8	1,892	106.9	5.6
1952	1,518	86.8	5.7	1,909	98.9	5.2
1954	1,585	110.8	7.0	1,969	129.1	6.6
1956	1,743	103.4	5.9	2,141	122.5	5.7
1958	1,831	90.5	4.9	2.114	99.5	4.7
1960	1,937	75.3	3.9	2.184	84.0	3.8
1962	2,065	70.8	3.4	2,279	77.8	3.4
1964	2,283	81.6	3.6	2,457	87.6	3.6
1966	2,604	82.3	3.2	2,679	82.1	3.1
1968	2,945	76.4	2.6	2,826	74.0	2.6
1970	2,376	91.1	2.7	2,903	80.1	2.8
1971	3,605	93.4	2.6	2,972	80.2	2.7
1972	3,843	92.7	2.4	3,067	76.2	2.5
1973	4,295	104.0	2.4	3,227	73.6	2.3
1974	4,642	122.9	2.6	3,143	76.0	2.4
1975	5,040	133.4	2.6	3,127	76.1	2.4

Notes: CPI = Consumer Price Index; base 1967 = 100
FPI = Food Price Index; base 1967 = 100

Source: Calculated from: Neil A. Lawrence et al., U.S. Coffee Consumption, 1946-76, FAS M-275, (Washington, D.C.: U.S.D.A. Foreign Agricultural Service, February 1977), p. 8.

agreement, to be discussed at some length in a later chapter, lends itself well to this alternative of production control. Therefore, all said, it would appear that there is little cause for disputing Pincus' assertion that "coffee is an appropriate product for price fixing arrangements."[86]

The ICA: Hopes and Fulfillments

The long-term[87] International Coffee Agreement was negotiated at the United Nations Coffee Conference in 1962. Probably the most important event that triggered the convening of the conference was U.S. President John F. Kennedy's intimation that:

> The United States is ready...to cooperate with the Latin American and other producing country governments in a serious case-by-case examination of the major commodities and to lend its support to practical efforts to reduce extreme price fluctuations.[88]

The preamble to the agreement that emerged from the U.N. Coffee Conference acknowledged that in the absence of internationaal action "the tendency towards persistent disequilibrium between production and consumption, accumulation of burdensome stocks, and pronounced fluctuations in prices...cannot be corrected by normal market forces...."

The objectives of the agreement were spelled out as:

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 fluctuation 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's 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."

Article 27 (General Undertaking by Members) states:

1) "The Members undertake to conduct their trade policy so that the objectives set forth in Article 1 and in particular, paragraph (4) of that Article, may be achieved. They agree on the desirability of operating the Agreement in a manner such that the real income derived from the export of coffee could be progressively increased so as to make it consonant with their needs for foreign exchange to support their programmes for social and economic progress.

2) "To attain these purposes through the fixing of quotas as provided for in this chapter and in other ways carrying out the provisions of the Agreement, the members agree on the necessity of assuring that the general level of coffee prices does not decline below the general level of such prices in 1962.

3) "The members further agree on the desirability of assuring to consumers prices which are equitable and which will not hamper a desirable increase in consumption."

Clearly the agreement had intentions of stabilizing the market and bringing about an upward trend in prices and export earnings. The act of causing price and earnings trends to move in an upward direction is a form of aid from the importing countries to the exporting countries and is usually referred to as a transfer of resources in favor of the

exporting countries. Objectives paragraph 4, the most important according to Article 27, seeks to increase the purchasing power of coffee exporting countries by keeping prices at equitable levels and increasing consumption. Then in Article 27, members undertake to work towards progressively increasing the real value of coffee export earnings so that these earnings are kept in harmony with the foreign exchange requirements for developmental purchases from abroad. To attain this goal they agree to impose export quotas to restrict exports so that prices are maintained at/or above their 1962 levels. These objectives were continued almost intact when the agreement was renewed in 1968. The 1976 re-negotiated agreement has several important modifications which will be discussed in a later chapter.

Today the ICA has, with some ups and downs, completed two five-year terms and effective October 1, 1976 has started on a new term. An UNCTAD study covering the 1958-71 period revealed that, on the average, coffee prices were more unstable during the operation of both the 1962 and 1968 ICAs than before. The average deviations from a calculated trend line (average of residuals as a per cent of the trend values) were 4.95, 6.15 and 12.92 for the pre-ICA period (April 1958-June 1963), during the 1962 ICA (July 1963-September 1968), and during the 1968 ICA (October 1968-October 1971), respectively. The study, however, could not conclude as to the extent to which that apparent instability had to do with the operations of the ICA or due to natural phenomena.[89] It is worth noting that during 1963-71 two serious frosts hit Brazil while there was none during the 1958-62 period.

Yogerson has found little evidence to indicate that the ICA helped bring about progress towards equilibrium between supply and demand or reduction in stocks. He notes that the world stocks of coffee declined from 64.7 million bags in October 1963 to 23.4 million bags (60 kilos each) in September 1971, largely as a result of adverse production conditions in Brazil (mostly frosts). He gives the ICA credit for stabilizing prices for Robustas (largely African coffee), and Unwashed Arabicas (mainly from Brazil) but not for Mild Arabicas (otherwise called Colombia Milds) and the Other Milds (the latter being mostly produced in Central America).[90]

Geer gives high credit to the ICA for its achievement in stabilizing coffee prices generally. His studies revealed that before 1962 coffee prices fluctuated 12.4 per cent as compared to 6.9 per cent during the operation of the ICA.[91] Greater stability during the operation of the ICA has also been noticed by Da Silva who reports that the annual and especially monthly coffee prices have been particularly stable during this period.[92] In a report to the Congress, the Comptroller General of the United States notes that the ICA has been considerably successful in reducing surplus stocks which tended to overhang the market, and helped keep consumers' coffee prices below their pre-agreement levels while at the same time providing relatively stable foreign exchange earnings for the exporters.[93] The report attributes the extremes of prices during the mid 1970's to 1975, to frost in Brazil and other natural and political events in some producing countries.

As regards ICA's impact on price and earnings trends, Mueller

found in a study on coffee prices that during the 1962-68 period coffee prices fluctuated around a declining trend. This he attributed to an expected consequence of the relative bargaining strength of the importing and exporting countries in negotiating coffee price objectives within the agreement. The importers, being stronger, managed to pressure the producing countries into accepting relatively low price objectives.[94] Singh in a 1968 evaluation of the 1962 ICA observed with some caution that export earnings from coffee had increased by $500 million in 1966 as compared to 1962.[95] He quickly points out, though, that it is not possible to assess how much of this increase is strictly due to the operation of the ICA but he cites a World Bank study[96] which estimated that in the absence of the ICA coffee prices would have been about one half of their level in 1967. This serves to indicate that the ICA has had a considerable influence on coffee earnings during 1962-66.

Kravis expresses belief that the ICA is likely to have maintained coffee export earnings above what they might have been in its absence. He feels, however, that the absence of an adequate international machinery to channel these increased earnings to development or diversification projects rather than having them accrue to private producers thus encouraging increased production, may have diminished the developmental contribution of coffee and the ICA.[97] Yogerson also points out rather unenthusiastically that since prices generally tended to rise during the operation of the ICA, some transfer of resources in favor of the exporters is likely to have occurred.[98]

A 1969 study by the General Accounting Office (G.A.O.) came out strongly in support of ICA's success in facilitating the transfer of resources to the coffee exporting countries.[99] The study revealed that coffee importing countries through their participation in coffee trade within the framework of the ICA, contributed on the average $601 million per annum between 1964 and 1967 as aid towards producing countries' development. To obtain these results, the G.A.O. estimated what the level of prices, imports and exports would be in the absence of the ICA and compared these estimates with the actuals for the period of their study. The difference between the actual and estimated coffee export values is the aid contribution. There are evidently problems in the methodology used in the analysis of this study. For instance, one wonders how much conficence to place on estimates of trade in the absence of the ICA. Mingst notes that the study omitted the 1954-57 period as being unrepresentative, and disregarded the 1963 frost in Brazi In short, the study may have served its purpose of impressing the Congres as to the need for its continued support of the agreement, but that is about it — the statistical results are of little value. After reviewing the study, Mingst concludes that, while the specifics of the study leave much to be desired, the gist is probably right, that the ICA did serve as an instrument for transferring resources to the exporting countries.[100]

To summarize this chapter, we have seen that there is considerable agreement among economists that the commodity problem is a real threat to many weak LDC economies and their primary commodity exports. We have

also seen that insofar as coffee is concerned, free markets are not likely to succeed in ameliorating the problem. The literature reviewed point to a considerable acceptance of the view that deliberate market intervention at the international (producer/consumer) level has the potential of raising the trends in coffee prices and earnings as well as reducing market instability. The record on the ICA's performance is rather disappointing but then given its structure and the intervening circumstances, not the least of which is the greater frequency of devastating frosts in Brazil and other disrupting natural and social occurrences, it might have been wishful to expect more. As Galloway has noted:

> The ICA is not the most efficient way, or the most effective way, to deal with the problems. However, the more efficient ways do not stand a chance of being accepted.[101]

The agreement, therefore, may be viewed as providing a second best solution to the commodity problem as it relates to coffee and therefore deserves support, including Tanzania's support.

FOOTNOTES

1. Isaiah Frank. "Toward a new framework for international commodity policy". Finance and Development, International Monetary Fund and the World Bank, Vol. 13, #2 (June 1976), p. 18.

2. Alton D. Law, International Commodity Agreements (Lexington: D.C. Heath and Company, 1975), p. 10.

3. United Nations, Instability in Export Markets of Under-developed Countries, (New York: U.N. Department of Economic Affairs, 1952).

4. Ibid., p. 3.

5. Ibid., p. 6.

6. International Monetary Fund - World Bank, The Problem of Stabilization of Prices of Primary Products, Part I, (Washington, D.C.: I.M.F.-I.B.R.D., 1969).

7. See for example: Ibid.; G. Erb and S. Schiavo-Campo, "Export-Instability, Level of Development and Economic Size of Less Developed Countries," Oxford Bulletin of Economics and Statistics, (May 1970), pp. 575-580; G. Glezakos, "Export-Instability and Economic Growth: A Statistical Verification," Economic Development and Cultural Change, (July 197 pp. 670-678; T. Morrison and L. Perez, Export-Earnings Fluctuations and Economic Development: An Analysis of Compensatory Financing Schemes, A.I.D. Discussion Paper #32, (Washington, D.C.: Bureau for Program and Policy, September 1975); G. Michalopoulos and L. L. Perez, "Commodity Trade Policy Initiatives and Issues," (Paper presented at the Ford Foundation Conference on Stabilizing World Commodity Markets, Analysis, Practice and Policy, Airlie, Virginia, March 1977).

8. G. K. Helleiner, International Trade and Economic Development, (Harmondsworth, England: Penguin Books, 1972), p. 78.

9. MacBean, op. cit.

10. J. D. Coppock, International Economic Instability, (New York: McGraw-Hill, 1962).

11. B. F. Massell. "Export Instability and Economic Structure". American Economic Review, Vol. LX, #4 (1970), pp. 618-630.

12. Peter B. Kenen and Constantine S. Voivodas, "Export Instability and Economic Growth", Kyklos, Vol. XXV (1972), p. 798.

13. Ibid., p. 802.

14. T. Morgan, "Trends in Terms of Trade, and Their Repercussions on Primary Producers", in Economic Development: Readings in Theory and Practice, ed. by T. Morgan and G.W. Betz (Belmont, California: Wadsworth Publishing Company, 1970), p. 233.

15. Ibid., p. 238.

16. J.P. Powelson, "The Strange Persistence of the 'Terms of Trade'", Inter-American Economic Affairs, (1977), pp. 17-28.

17. J. P. Hayes, Terms of Trade Policy for Primary Commodities, Report to the Commonwealth Secretariat (London: Commonwealth Secretariat, 1975).

18. Ibid., Table 1.

19. E. M. Brook, E. R. Grilli, and J. Waelbroeck, Commodity Price Stabilization and the Developing Countries: The Problem of Choice, World Bank Staff Working Paper #262 (Washington, D.C. I.B.R.D., July 1977), p. 1.

20. For a detailed discussion of these conditions see: I.M.F.-I.B.R.D., op. cit., Ch. III, and Michalopoulos and Perez, op. cit., pp. 12-19.

21. Helleiner, op. cit., pp. 79-80.

22. Brook, Grilli and Waelbroeck, op. cit., pp. 6-7.

23. a) Linear and negatively sloped demand curve, and postively sloped supply curve;
b) Instantaneous reaction of supply and demand to price changes;
c) Parallel shifts of demand and supply curves over the two periods; and
d) Price stabilization at the mean of the prices that would have prevailed in the absence of market price stabilization.

24. Michalopoulos and Perez, op. cit., pp. 14-15.

25. See for example, Herbert A. Grubel, "Foreign Exchange Earnings and Price Stabilization Schemes", American Economic Review, Vol. LIV, (1964), p. 378.

26. See for example, Shamsher Singh, "The International Dialogue on Commodities", reprinted from Resources Policy, by The World Bank (Washington, D.C.: I.B.R.D. June 1976), p. 88; and Frank, op. cit., p. 18.

27. Constantine Glezakos. "Export Instability and Economic Growth: A Statistical Verification", Economic Development and Cultural Change, Vol. XXI (July 1973), pp. 674-675.

28. Constantine S. Voivodas. "The Effect of Foreign Exchange Instability on Growth", The Review of Economics and Statistics, Vol. LVI (1974), p. 411.

29. Glezakos, op. cit., p. 674.

30. International Compensation for Fluctuation in Commodity Trade, United Nations (New York: United Nations, 1961), cited in Robert M. Stern, "International Compensation for Fluctuations in Commodity Trade" Quarterly Journal of Economics, Vol. LXXVII, (1963), p. 259.

31. Stern, op. cit., p. 259.

32. R. Hawkins, J. Epstein, and J. Gonzales. "Stabilization of Export Receipts and Economic Development -- International Commodity Agreements and Compensatory Financing Plans", The Bulletin, New York University, (November 1966); cited in Voivodas, op. cit., p. 410.

33. Brook, Grilli and Waelbroeck, op. cit., p. 3; also see H. R. Heller, "Optimal International Reserves", The Economic Journal, Vol. LXXVI, #320, (June 1966), pp. 296-311.

34. Helleiner, op. cit., p. 84.

35. Kenen and Voivodas, op. cit.

36. Ragnar Nurkse, "Trade Fluctuations and Buffer Price Policies of Low-Income Countries", Kyklos, Vol. XI, p. 143.

37. Hiroshi Kitamura and Shu-Chin Yang. "Domestic Stability and Development: A Critique of Nurkse's Scheme", Kyklos, Vol. XII (1959), pp. 316-328, cited in Ernest P. Nzekio, "Stability, Export Taxation, and Economic Development: The Role of Cocoa Marketing Boards and Cocoa Stabilization Funds in Nigeria. Ghana, Ivory Coast and Cameroun", (unpublished Ph.D. thesis, University of Wisconsin-Madison, 1973), p. 19.

38. See for example, Frank, op. cit., p. 20; Constantine Michalopoulos, U.S. Commodity Trade Policy and the Developing Countries, A.I.D. Discussion Paper #37, A.I.D. Bureau of Program and Policy Coordination, (Washington, D.C.: A.I.D., January 1977), p. 14; and Richard N. Cooper and Robert Z. Lawrence, "The 1972-75 Commodity Boom", Brookings Papers on Economic Activity, (3:1975), pp. 671-715.

39. C. N. Vakil and P. R. Brahmanand, "Price Stabilization Versus Fiscal Stabilization", Kyklos, Vol. XII, (1959), pp. 329-340 cited in Nzekio, op. cit., p. 19.

40. Alexandre Kafka, Comment to Nurkse, op. cit., pp. 212-223, cited in Nzekio, op. cit., p. 19.

41. Brook, Grilli and Waelbroeck, op. cit., p. 4.

42. Grubel, op. cit., p. 378.

43. Nurkse, op. cit., p. 143.

44. Odin Knudsen and Andrew Parnes. Trade Instability and Economic Development (Lexington, Mass.: D.C. Heath and Company, 1975), p. 31.

45. This theory divides income into two parts -- Permanent and Transitory incomes, and hypothesizes that comsumption expenditures are determined primarily by the desired level of permanent income. High fluctuations of transitory income necessitates the holding of higher levels of reserves so as to ascertain that the permanent income level is maintained, thus tending to reduce the propensity to consume and increasing the saving rate.

46. Kudsen and Parnes, op. cit., p. 127.

47. MacBean, op. cit., p. 112.

48. Sir Sydney Caine, Comment on Nurkse, op. cit., p. 188.

49. Singh, op. cit., p. 89.

50. Michalopoulos and Perez, op. cit., p. 13.

51. Singh, op. cit., p. 88.

52. It has been estimated that the abolition of DC protectionist policies by 1980 on nine products alone would avail the LDCs an opportunity to earn about $7 billion a year in 1974 dollars. (see: World Bank, Possible Effects of Trade Liberalization on Trade in Primary Commodities, (Washington, D.C.: World Bank, 1975), cited in Singh, op. cit., p. 88.

53. Michalopoulos and Perez. op. cit., p. 11 note that the price and income elasticities of demand for primary products is usually less than 0.5 both in the short and medium term. Law, op. cit., p. 20 reports that the price elasticity of supply for primary products is estimated to be less than unity.

54. Frank, op. cit., p. 18.

55. R. Porter and C.P. Staelin, "Some Implications of Post-War Primary Trends" Journal of Political Economy, (May-June 1970), p. 586. cited in R. Porter, "The Rediscovery of Exports by the Third World", Foreign Trade Review, Vol. VI, #4 (January-March, 1972), pp. 352-53.

56. See for example, Hayes, op. cit., and Powelson, op. cit.

57. Paul Streeten and Diane Elson, Diversification and Development: The Case of Coffee, New York: Prager Publishers, 1971), p. 13.

58. Derek J. Ford. "Commodity Market Modeling and the Simulation of Market Invervention: The Case of Coffee", Paper presented at the Ford Foundation Conference on Stabilizing World Commodity Markets, Arlie, Virginia, (March 17-20, 1977), p. 11

59. Streeten and Elson, op. cit., p. 17.

60. Henry Hopp and Richard J. Foote, "A Statistical Analysis of Factors That Affect Prices of Coffee", Journal of Farm Economics, (August 1955), p. 435. Hopp and Foote examining the response of Brazilian production to U.S. price changes found this lag to have varied from 2 to 10 years (average 5 years) for the 1872 to 1945 period (see Table 2 in their article).

61. Jos de Vries, Structure and Prospects of the World Coffee Economy, I.B.R.D. Staff Working Paper #208, (Washington, D.C.: I.B.R.D. June 1975), p. 3; and Streeten and Elson, op. cit., pp. 13-16.

62. Streeten and Elson, op. cit., p. 16.

63. Shamsher Singh, et al., Coffee Tea and Cocoa: Market Prospects and Development Lending. (Baltimore: Johns Hopkins University Press, 1977), p. 31, Table 3.

64. Singh, et al., op. cit., pp. 31-32.

65. Food and Agriculture Organization. The World Coffee Economy, Commodity Bulletin Series #33, (Rome: F.A.O., 1961), p. 3.

66. Eugene Blair Rourke. "Causes and Predictability of Annual Changes in Supplies and Prices of Coffee". (Unpublished Ph.D. Thesis, Stanford University, 1969), p. 28.

67. Hopp and Foote, op. cit., pp. 428-429.

68. Milton Friedman, Essays in Positive Economics. (Chicago: Chicago University Press, 1953), p. 175.

69. William J. Baumol. "Speculation, Profitability and Stability", Review of Economics and Statistics, Vol. XXXIX, (1957), pp. 263-271.

70. de Vries, op. cit., pp. 27-31.

71. A. Parikh. "United State, European and World Demand Functions for Coffee". American Journal of Agricultural Economics. (1973), pp. 490-494.

72. Pan American Coffee Bureau, Annual Coffee Statistics, (New York: P.A.C.B., 1973), p. A-97, Table C-2.

73. H.J. Maidenberg. "There's Worse to Come in Coffee," New York Times, (January 196, 1977).

74. Constantine Michalopoulos, US Commodity Trade Policy and the Developing Countries, A.I.D. Bureau of Program and Policy Coordination, Discussion Paper #37, (Washington, D.C.: A.I.D., January 1977), p. 16.

75. John A. Pincus, ed. Reshaping the World Economy, (Englewood Cliffs, N.J.: Prentice-Hall, 1968).

76. Frank, op. cit., p. 18.

77. Michalopoulos, op. cit., p. 14.

78. Michalopoulos and Perez, op. cit., pp. 22-23.

79. Jere R. Behrman. International Commodity Agreements: An Evaluation of UNCTAD Integrated Commodity Programme (Washington, D.C.: Overseas Development Council, October 1977), pp. 10-11.

80. Harry G. Johnson, Economic Policies Toward Less Developed Countries, Washington, D.C.: The Brookings Institution, 1967), p. 145.

81. See for example, Harry G. Johnson, "Commodities: Less Developed Countries' Demands and Developed Countries' Response", Paper presented at MIT Workshop on specific proposals and desirable DC Response to LDC Demands Regarding the New International Economic Order, May 17-20, 1976. Forthcoming in volume edited by Jagdish Bhagwati, to be published by MIT Press, cited in Behrman op. cit.

82. Behrman, op. cit., pp. 10-13.

83. Pincus, op. cit., p. 151.

84. Food and Agriculture Organization, The World Coffee Economy, F.A.O. Commodity Bulletin series #33. (Rome: F.A.O. 1961), p. 3.

85. Neil A. Lawrence, et al. U.S. Coffee Consumption 1946-1976, U.S.D.A. Foreign Agricultural Service, Document FAS M-275, (Washington, D.C.: U.S.D.A., February 1977), pp. 3-4.

86. Pincus, op. cit., p. 154.

87. Long-term International Coffee Agreement involved producing and consuming countries. Its different from a producers' only short-term International Coffee Agreement which was signed into force in 1958 and wound up at the start of the long-term agreement in 1963.

88. Memorandum from Lincoln Gordon, Latin American Task Force, Department of State, to Richard J. Godwin, White House, (Washington, D.C. Department of State, March 6, 1961); cited in Bart S. Fisher, The International Coffee Agreement: A Study in Coffee Diplomacy, (New York: Praeger, 1972), p. 28.

89. United Nations Conference on Trade and Development Board, Effectiveness of Commodity Agreements, Document TD 129 (February 1972), cited in Karen A. Mingst, "The Process of International Policy Making in Regulation of Tropical Agriculture Products: Coffe and Cocoa". (Unpublished Ph.D. Thesis, University of Wisconsin, 1974), pp. 316-320.

90. Vernon Yogerson. "The International Coffee Agreement: Prospect and Restrospect." Development and Change, #7, (1976), pp. 207-

91. Thomas Geer, An Oligopoly: The World Coffee Economy and Stabilization Schemes. (New York: Dunellen, 1971), p. 183.

92. Clovis Da Silva, "Economic Impact of the International Coffee Agreement: The Agreement and Business Community", World Coffee and Tea, (November 1970), p. 50, cited in Mingst, op. cit., p. 315.

93. Comptroller General of the United States, Coffee: Production and Marketing Systems, Report to the Congress, (Washington, D.C.: General Accounting Office, October 1977), pp. 12-13.

94. Charles C. Mueller, "The Impact of the International Coffee Agreement on the Price of Coffee". Revista Brazileira de Economia Vol. 25, #3 (July/September 1971), pp. 149-66.

95. Shamsher Singh, International Coffee Agreement, 1968: Background and Analysis, I.B.R.D. Report # EC 165, (Washington, D.C.: I.B.R.D. August 1968), pp. 18-19.

96. Economic Department, IBRD: "Report on the International Coffee Council" Sec. M-66-339, (October 27, 1966); cited in Singh, op. cit., p.

97. Irving B. Kravis, "International Commodity Agreements to Promote Aid and Efficiency: The Case of Coffee", Canadian Journal of Economics, (May 1968), pp. 296-417. There appear to be two closely related arguments behind Kravis' advocacy for international rather than national machinery for channeling increased coffee export earnings to development efforts. In the first place, he shares the view that the ICA's success in boosting coffee export earnings is considered to be a form of multilateral aid to the producing countries; as such, the

fate of these proceeds need be determined and guided by the international community rather than left to private profit hungry coffee growers and merchants. Secondly, the unimpressive performance of production controls and diversification programs in most producing countries during the 1962 and 1968 ICAs point to the lack of will or ability for these countries' institutions to carry out such programs on their own.

98. Yogerson, op. cit., p. 213.

99. Report to Congress by the Comptroller General of the United States, "Foreign Aid Provided Through the Operation of the United States Sugar Act and the International Coffee Agreement", Inter-American Economic Affairs, Vol. XXVII, (November 1969), pp. 88-95, cited in Mingst, op. cit., p. 306-310.

100. Mingst, op. cit., p. 308.

101. Thomas Galloway, "The International Coffee Agreement", Journal of World Trade Law, (1973), p. 374.

CHAPTER III

THE TRENDS, STABILITY, AND PURCHASING POWER OF TANZANIA'S COFFEE EXPORT EARNINGS

The International Coffee Agreement has been a prominent feature in the world coffee trade scene for over a decade and a half now. Inherently an agreement is a compromise between the aspirations of the various interests of parties to the accord. Some of these party interests may be conflicting, while some, hopefully most, are likely to be mutural and complementary. The stated objectives of such an agreement are expressions, in summary form, of these aspirations -- at least those of the senior parties to the agreement. As for the junior parties, those with smaller market shares or weaker economic muscle, the issue is not really whether or not their interests are built into the agreement, but rather the extent to which they share the aspirations expressed in the objectives of the agreement, and therefore whether they should join or stay out and the consequences thereof. As Gwyer has pointed out:

> Large and small producing countries have unequal strengths in determining whether an agreement should continue or indeed begin. For large producing countries, the choice is between an agreement and no agreement, since their exclusion from an agreement would make it inoperable. For small countries, the choice is membership in the agreement or non-membership, since their membership may not be essential for continuation of the agreement. Thus, large producing countries (and we might add large consuming countries as well) force an agreement upon small countries, which, if they had the choice, would prefer no agreement but are presented with a membership-non-membership alternative. In practice, there may be no alternative to membership, since if all consuming countries are party to the agreement, there are no alternative markets.[1]

A contributor of less than 1.5 per cent of the world's exportable coffee production, Tanzania fits well in the junior or small country category in the ICA membership. However, as has been pointed out earlier, Tanzania has a large measure of commonality in interest with the ICA's most important objective: market stabilization around a rising trend in prices and purchasing power of producing countries' coffee export earnings.

The object of the present chapter is to present some empirical evidence as to the extent to which the aforesaid prime objectives of the agreement have been realized by Tanzania as a participant in the agreement from its very start.[2] However, before going into the empirical evidence, a brief historical background to the ICA's operation should set the stage.

Although the agreement was reached in August 1962, it did not come into force until October 1, 1963. The intervening period was required to allow the various prospective member countries to get the agreement through their respective legislative ratification procedures. This initial agreement was for five years and just before the end of that period in 1968, members agreed to renew the accord for a further five years. This new lease on life on the agreement was to end on September 30, 1973 and a new agreement re-negotiated before that date. However, a combination of factors, the most important of which were the 1972 Brazilian frost and the post-1970 international monetary instability culminating in the August 1971 US dollar devaluation, led, in December 1973, to members failing to agree on the price goals and quotas for the then remaining three quarters of the 1972/73 coffee year, thus rendering the world

coffee market "free for all" thereafter. The members however agreed to retain the International Coffee Organization (ICO), the agreement's administrative body, as a center of statistics and forum for re-negotiating a new agreement. The new agreement was reached in 1975 and after ratification by the requisite number of nations, came into force on October 1, 1976.

Description of Statistical Data and Methods of Analysis

Since our present study relates to the economic provisions of the agreement, the empirical analysis only deals with the period of time during which the economic provisions of the agreement, price and export quota mechanisms, were actively in force, that is October 1, 1963 to September 30, 1972. Data for this period counting the full years, i.e., 1964-1972, is analyzed and the results compared with the results of comparable data analysis for an equivalent stretch of time before the agreement came into force, 1955-1963.

By coincidence this critical period of our study starts in 1955, just as coffee prices had started on their way down from the all-time price highs of 1954, and ends in 1972, just after the beginning of the 1970's coffee price hike unleashed earlier by the 1969 frost in Brazil. The main empirical work therefore misses the two market extremes, neither of which can be claimed to the credit of either the consumers or producers or indeed to negotiations within the ICA or any other international body. Rather, they were caused by natural and other phenomena not specifically calculated to affect the world coffee market. By avoiding these extremes, the study may be said to

be short of up-to-dateness and comprehensiveness, but by missing these periods of extremity, it means that we are dealing with a period of time that is more representative of the long-term state of the world coffee market. Indeed by avoiding these extremes, we may be more able to isolate the impact of the ICA and Tanzania government policy on the variables under study. Another important factor in choosing for our central concern, a period of time going back only to 1955, is so that we have equal stretches of time during and before the agreement.

As discussed earlier, Tanzania, like most LDCs that are heavily dependent on their exports of primary commodities for their development, is mainly concerned with the size and value of foreign exchange that her exports generate, since the size of these earnings and their purchasing power are most closely related to the country's pace of economic growth. In this analysis, therefore, our central dependent variable is Tanzania's export earnings from coffee. To facilitate comparison of our results over time and particularly in accordance with the undertaking of the ICA to increase the real value of producing countries' export earnings from coffee, we deflate Tanzania's coffee export earnings by the United Nations' index of unit values for manufactured exports from the developed market economies (Iu) with 1962 as the base year. The year 1962 has been chosen as our base year again in line with

ICA's undertaking to keep coffee export prices at or above their levels in 1962 as one of the ways of attaining its aforesaid export earnings undertaking. We label the resulting variable Vxa and show its construction in Appendix Table 7.

Of necessity export earnings are the product of volume of exports and unit price, meaning that the behavior of Vxa may be explained by changes in the volume and unit price of these exports, as well as changes in developed country manufactured export prices (Iu). In this regard, therefore, we also analyze Tanzania's volume of coffee exports (Qx) and her export price.

Qx is a straight forward variable but the export price of one country, particularly that of Tanzania, is not as clear. Tanzania produces and exports three types of coffee -- Colombia Mild Arabicas, Hard Arabicas (unwashed Arabica coffee), and Robustas, each of which is priced very differently in the world market (see Appendix Table 8). Within each type there are numerous quality classes and grades[3] each of which class and grade is priced differently. Furthermore, with the operation of the ICA and the tendency for Tanzania's marketable production to exceed her ICA allocated quota, Tanzania has had to export considerable quantities of her coffee to the non-quota markets as well as to quota markets in accordance with her quota allocation. These markets offer different prices even for the same type and quality of coffee -- non-quota market prices are the lower of the two sets of prices. Given this heterogeneity in prices, any price that one chooses to call Tanzania's coffee export price is but a proxy of the actual unknown price. In this study we analyze two such proxies:

(i) Pxa = Vxa/Qx

(ii) Pta = Weighted average of New York Coffee market annual average spot price for Colombia Mild Arabicas and Robustas weighted respectively by the ratio of each of these types of coffee to Tanzania's total coffee exports (see note on Appendix Table 8 where this price is constructed).[4]

It should be noted that there is a considerable relationship, in terms of magnitude, between the ICO's indicator prices[5] and the New York market price used here. After the ICA membership agree on the price goals (range, ceiling, and floor) for each of the various types of coffee during a given period of time, the ICO uses export quota adjustments to keep the market price in line with the agreed price goals. The result is that as long as the agreement's controls operate, the two sets of prices will remain close to each other -- ideally the market prices fluctuate within the indicator price ranges. The two sets of prices are therefore reasonably good estimates of one another.

Qx is of particular interest in our analysis and study, generally for two main reasons. Firstly, it is the operational variable of the ICA (the other being price) upon which Tanzania has the most influence — both from a domestic policy point of view and from her ICA negotiations vantage. The agreement did not, at least during our period of concern, impose absolute restrictions on producing countries to export (the quota restrictions only applied to traditional markets), and since sanctions against countries under-exporting their quotas were farily liberal, decisions to reduce or increase the volume of exports

were largely domestic policy variables to each producing country. From the point of view of ICA negotiations, a small market share holder was likely to find it relatively easier to negotiate a given percentage increase in the country's quota than to negotiate any increase in export price. This is because a small increase in such a member country's quota would have little, if any, impact on the overall market situation, while an increase in price would have to affect the entire market, and as such would most likely face much stiffer resistance. The situation is reversed in the case of large market share holders. A small percentage increase in such a member's export quota would have a major depressing effect on the entire market, therefore others would most likely oppose such an increase vigorously. On the other hand, a large market shareholder would have more votes in ICA negotiations and therefore greater capability to rally enough support to get a price change proposition voted in -- such a member would only need a few votes in addition to its own to master a majority. It is, therefore, logical that Tanzania in formulating her domestic policies as well as her policies relating to the ICA and world coffee trade at large, should concentrate more on her volume of exports and market share than on price — the dividends of such a strategy are greater and more certain, and the stakes higher with respect to export volume than prices.

Secondly, Tanzania is a very low cost producer of coffee since over 80 per cent of her coffee crop is produced at the smallholder peasant scale using a minimum of off-farm produced (purchased) inputs. The Tanzanian Ministry of Agriculture's Market Development Bureau in a

1977 study notes that coffee is likely to remain by far the most profitable crop in terms of income per labor day for a long time yet.[6] This view is not new nor merely reflecting a short sighted optimism of the abnormal mid-1970's coffee prices. In 1965 Albert Vinton of the FAO wrote:

> Coffee is one of the most profitable and most prosperous of all major agricultural exports. No other agricultural commodity earns so much foreign exchange for developing tropical and sub-tropical countries as does coffee, or yield such favorable returns per acre or per man-hour of work.[7]

The Market Development Bureau study estimated the recurrent costs to the typical Tanzanian smallholder to produce one kilo of Arabica and Robusta coffee to be 93 cents and 31 cents (Tanzanian) respectively, approximately 12 cents and 9 cents (US) in 1977.[8] At these levels of production costs there is little doubt that coffee is a very profitable commodity for Tanzania even at prices much lower than those ruling in 1977. This points to our contention that price, at least at the present time and for a long time to come, is of little importance in Tanzania's coffee policy formation.

Empirically the direct ICA operational variables, indicator prices and export quotas, did not exhibit significant relationships with Vxa. An estimate of the ICO's indicator price for Tanzania's coffees (Pia)[9] proved insignificant in explaining variation in Vxa. When Vxa was regressed on Pia alone, the coefficient of correlation was a mere .013 which was statistically insignificant at the .05 level of confidence. (Hereafter unless otherwise stated, statistical significance refers to the .05 level). When Vxa was regressed on Qe (Tanzania's

ICO effective quota),[10] the R^2 value was .176. Even combined in an additive model, the two variables explained only 18.7 per cent of the variation in Vxa which remained statistically insignificant. This apparent weak relationship between Vxa and the direct ICO operational variables seems to stem, at least in part, from the already mentioned fact that Tanzania, as a result of receiving an export quota that was disproportionate to her output has had to turn to the low priced non-quota markets for a large share of her total export volume. In addition, Tanzania's coffee is sold for export ex-warehouse Moshi for Mild Arabica and Tanga for Robusta and Hard Arabica. Moshi is some 300 miles from both Tanga and Mombasa, the main ports of exit for the country's coffee exports, while ICO indicator prices are on the basis of C.I.F. (cost, insurance, freight), New York (see footnote 5). Therefore, to relate Tanzania's export sales price to the indicator price, one would have to take count of many intervening costs including handling, freight, banking, insurance, etc., some of which themselves vary over time. Another factor contributing to the gap between Tanzania's actual export price and the ICO indicator price, one which may easily be overlooked, is relative marketing ability between Tanzanian coffee authorities and the multi-national coffee firms that buy the country's coffee. These buyers' relative superior marketing ability and their access to more indepth information on the trade at any point in time, is likely to cause the price gap to widen even more.

As is shown in text Table 15, Pta was found to have explained 41.6 per cent of the variation in Vxa during 1955-63. During 1964-72 and 1955-72, this variable lost its significance to explain variation

TABLE 15

TANZANIA COFFEE EXPORT PRICES (Pta, Pxa):[a] RELATIONSHIP WITH COFFEE EXPORT EARNINGS

Period	b_0	b_1	R^2	Significance Test for b_1 at the .05 level: Test Statistic $\|t^*\|$	Critical Value $t(1-\alpha/2, n-p)$[b]	Conclusion b_1 significant or not[c]
Model: E (Vxa) = b_0 + b_1 Pta						
1955-63	11.324	0.203	.516	2.73	2.365	significant
1964-72	41.365	-0.220	.009	-0.25	2.365	insignificant
1955-72	31.422	-0.117	.014	-0.47	2.120	insignificant
Model: E (Vxa) = b_0 + b_1 Pxa						
1955-63	10.956	0.229	.892	7.6	2.365	significant
1964-72	14.203	0.536	.487	2.58	2.365	significant
1955-72	23.235	0.087	.014	0.47	2.120	insignificant

Notes: [a] See Appendix Tables 7 and 8 for construction of Pta and Pxa.

[b] α = level of significance

[c] Decision Rule: If $|t^*| \leq t(1-\alpha/2, n-p)$, conclude b_1 is insignificant, otherwise conclude b_1 is significant.

n = number of observations.

p = number of parameters.

TABLE 16

TANZANIA'S VOLUME OF COFFEE EXPORTS (Qx): RELATIONSHIP WITH COFFEE EXPORT EARNINGS (Vxa)

	Model: $E(Vxa) = b_0 + b_1 Qx$					
				Significance Test for b_1 at the .05 level		
Period	b_0	b_1	R^2	Test Statistic $\|t^*\|$	Critical Value $t(1-\alpha/2, n-p)$	Conclusion: b_1 significant or not
1955-63	33.758	-0.574	.489	-2.59	2.365	significant
1964-72	30.435	0.051	.003	0.15	2.365	insignificant
1955-72	10.755	0.469	.496	3.97	2.120	significant

in Vxa during both 1955-63 and 1964-72. We chose to drop Pia from further analysis because apart from its relative inability to explain variation in Vxa, it only was available for 1964-72 and not before. This means that it did not lend itself to comparisons between the period before the agreement and during the operation of the agreement. Both of the other two proxies of export price were available for both periods and were better in explaining variation in Vxa.

As is indicated in text Table 16, Qx significantly explained variation in Vxa during 1955-63 and 1955-72. During 1964-72, Qx was statistically insignificant in explaining Vxa.

For trend and instability analyses, we include time (t) as an independent variable in explaining the behavior of both Vxa and the independent variables - Qx, Pta and Pxa.

Trends in Tanzania's Coffee Export Earnings

As already mentioned, the ICA membership was, during the 1964-72 period, committed to "progressively" increase the real value of producing countries' coffee export earnings. This commitment means that there are two issues of concern with respect to the trends in these earnings. Firstly, we have to address ourselves to the question of whether these earnings increased, remained at the same level, or declined during the operation of the agreement relative to their pre-agreement levels. We answer this question by comparing the slopes of the trend lines of these earnings during and before the coming into force of the agreement. Secondly, if an upward trend in these earnings is evident, we need to

examine the rates of change in these trends to see whether they have been progressive, constant, or regressive. This we do by observing the signs and assessing the significance of the coefficient of the t^2 in a trend model of the general form:

$$Y = f(t, t^2, u)$$

where Y = the dependent variable

t = Time

t^2 = Square of t

u = Error term

To estimate these trends and their respective rates of change for Vxa, where applicable, we fitted by linear regression the response function.

$$E(Vxa) = b_0 + b_1 t + b_2 t^2$$

Where E(Vxa) = Expected value of Vxa

t = Time in coffee years

b_0 = Estimated value of Vxa at t = 0 but in the present model b_0 does not have any intrinsic value of its own since t = 0 is not considered.

b_1 = Estimated slope of the linear trend line

b_2 = Estimated curvature or acceleration coefficient of the trend line.

Text Table 17 summarizes the results of this analysis. In this table it is shown that the general trend of Vxa was significantly downwards during the 1955-72 period as evidenced by the negative coefficient to b_1 and the F-test results at the .05 level of significance. However, as indicated by the positive acceleration coefficient b_2, the rate of this apparent decline in the trend line was decreasing over

TABLE 17

TRENDS IN TANZANIA'S COFFEE EXPORT EARNINGS (Vxa)

Model: $E(Vxa) = b_0 + b_1 t + b_2 t^2$

Period	b_0	b_1	b_2	R^2	Significance test for fas b_1 and b_2 at the 0.4 level: Test Statistic[a] $\lvert t^* \rvert$ or F^*	Critical Value $t(1-\alpha/2, n-p)$ or $F(1-\alpha, p-1, n-p)$	Conclusion b_1 and b_2 significant or not
1955-63	23.764	-1.357	0.075	.340	1.54	5.14	b_1 and b_2 insignif.
		-1.357			-0.84	2.365	b_1 insignificant
			0.075		0.48	2.365	b_2 insignificant
1964-72	27.881	1.401	-0.070	.109	0.37	5.14	b_1 and b_2 insignif.
		1.401			0.37	2.365	b_1 insignificant
			-0.070		-0.19	2.365	b_2 insignificant
1955-72	20.958	-0.257	0.068	.553	9.28	3.68	b_1 and b_2 signif.
		-0.257			-0.24	2.120	b_1 insignificant
			0.068		1.25	2.120	b_2 insignificant

Notes: [a] F-test is used for testing whether b_1 and b_2 used together are significant, i.e., $b_1 = b_2 = 0$ against not both b_1, $b_2 = 0$, while t-test is used for testing whether b_1 and b_2 individually are significant, i.e., $b_1 = 0$ versus $b_1 = 0$, $b_2 = 0$ versus $b_2 = 0$.

[b] Decision Rule for t-test: See note under text Table 14.
Decision Rule for F-test: If $F^* \leq F(1-\alpha, p-1, n-p)$, conclude b_1 and b_2 together are insignificant, otherwise, conclude that they are significant.

time. It is interesting to note that individually, both b_1 and b_2 are shown by the t-test to be statistically insignificant while the F-test indicates at the same level of significance that the two variables together in the model are signigicant estimators of Vxa. This apparent paradox is largely a consequence of the high correlation between t and t^2 which leads to the results of a t-test reflecting the marginal effect of either variable when the other is already in the model.[11]

The trend is also downward with the rate of decline decreasing over time during the pre-agreement period, 1955-63, but this time both the F- and t-tests indicate that these results are statistically insignificant. During the operation of the ICA's controls, 1964-72, the situation with respect to the shape and rate of change in the slope reverses -- the slope is positive but its rate of change becomes negative though in both cases the results are again statistically insignificant.

As we mentioned before in our effort to explain the trends in Tanzania's coffee export earnings, we examine trends in the volume and price of these exports. To do this we fitted the models:

$$E(Qx) = b_0 + b_1 t + b_2 t^2$$

$$E(Pxa) = b_0 + b_1 t + b_2 t^2$$

$$E(Pta) = b_0 + b_1 t + b_2 t^2$$

Where: E(Qx) = Expected value of Qx.

E(Pxa) = Expected value of Pxa.

E(Pta) = Expected value of Pta.

b_0 = Estimated value of Qx, Pxa, Pta when t = 0 but here b_0 has no intrinsic value since t = 0 is not considered in the model.

b_1 = Slope of trend line.

b_2 = Acceleration coefficient of the trend line.

t = time in years

The results of these analyses are summarized in text Tables 18 for the volume of exports and 19 for the two price variables. Our results indicate that during 1955-63, Qx tended downwards and the slope was statistically significant. As is shown in text Table 18, b_2 was positive indicating, though statistically insignificant, that the rate of decline in the Qx trend may have itself been declining. Both our price variables experienced similar trends. The combined effect of these trends is the downward trend noted earlier in Vxa during this period of time.

During 1964-72, Qx tended insignificantly upwards while both price variables tended downwards. The negative slope of Pta was statistically significant but that of Pxa was not. However, the

TABLE 18

TRENDS OF TANZANIA'S VOLUME OF COFFEE EXPORTS (Qx)

Model: $E(Qx) = b_0 + b_1 t + b_2 t^2$

Period	b_0	b_1	b_2	R^2	Significance Test for b_1 and b_2 at .05 level: Test Statistic F^* and $\|t^*\|$	Critical Value $F(1-\alpha,p-1,n-p)$ or $t(1-\alpha/2,n-p)$	Conclusion: b_1, b_2 significant or not.
1955-63	20.155	-0.178	0.128	.759	9.43	5.14	b_1 and b_2 signif.
		-0.178			-0.15	2.365	b_1 not significant
			0.128		1.11	2.365	b_2 not significant
1964-72	27.881	1.401	-0.070	.109	0.43	5.14	b_1 and b_2 insignif.
		1.401			0.37	2.365	b_1 insignificant
			-0.070		-0.19	2.365	b_2 insignificant
1955-72	13.480	2.420	-0.025	.795	29.13	3.68	b_1 and b_2 signif.
		2.420			2.23	2.120	b_1 significant
			-0.025		-0.44	2.120	b_2 insignificant

TABLE 19

TRENDS OF TANZANIA'S COFFEE EXPORT PRICES (Pta and Pxa)

Period	b_0	b_1	b_2	R^2	Test Statistic F^* and $\lvert t^* \rvert$	Critical Value $F(1-\alpha, p-1, n-p)$ or $t(1-\alpha/2, n-p)$	Conclusion: b_1 and/or b_2 significant or not.
Model: $E(Pta) = b_0 + b_1 t + b_2 t^2$					**Significance Test for b_1 and b_2 at the 0.5 level**		
1955-63	69.689	-7.499	0.394	.927	38.14	5.14	b_1 and b_2 signif.
		-7.499			-3.94	2.365	b_1 significant
			0.394		2.12	2.365	b_2 insignificant
1964-72	46.130	-2.623	0.204	.673	6.17	5.14	b_1 and b_2 signif.
		-2.623			-2.72	2.365	b_1 significant
			0.204		2.17	2.365	b_2 insignificant
1955-72	62.042	-4.240	0.173	.714	18.75	3.68	b_1 and b_2 signif.
		-4.240			-4.97	2.120	b_1 significant
			0.173		3.95	2.120	b_2 significant
Model: $E(Pxa) = b_0 + b_1 t + b_2 t^2$							
1955-63	57.354	-3.383	0.021	.513	3.16	5.14	b_1 and b_2 insignif.
		-3.383			-0.59	2.365	b_1 insignificant
			0.021		0.04	2.365	b_2 insignificant
1964-72	42.055	-3.680	0.341	.83	0.27	5.14	b_1 and b_2 insignif.
		-3.680			-0.73	2.365	b_1 insignificant
			0.341		0.70	2.365	b_2 insignificant
1955-72	57.042	-4.072	0.163	.398	4.95	3.68	b_1 and b_2 signif.
		-4.072			-2.45	2.120	b_1 significant
			0.163		1.91	2.120	b_2 insignificant

insignificantly positive slope in Vxa during this period of time inspite of the continued growth in inflation resulting in the aforesaid trends in the price variables, seems to originate not so much from the slight positive slope of the Qx as to its newly acquired high level. Reference to Chart 7 and Appendix Table 7 reveal that during 1964/65 Qx increased from about 30,000 to about 50,000 metric tons and fluctuated at these high levels to the end of our period of concern. The apparent consequence of this is that export earnings remained high even though prices tended downward.

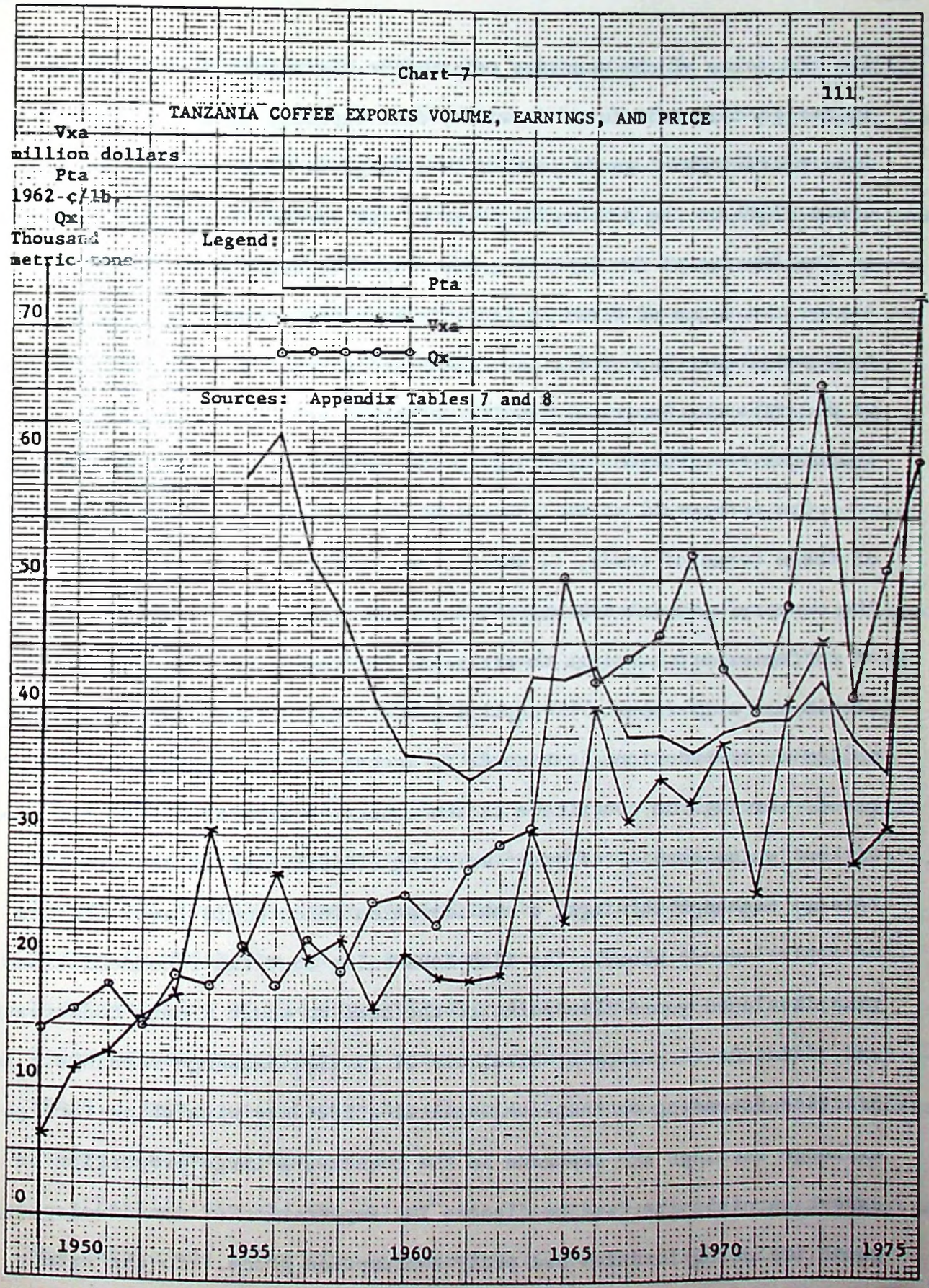
Over the entire period of our central concern, 1955-72, increasing inflation continued to depress the trends in our price variables, and in combination with sluggish growth in the volume of exports (averaging out the mid-1960's jump in export volume and the statistically significant negative trend experienced during 1955-63) to result in a negative slope in Vxa over this period -- this inspite of an overall significant positive slope in Qx during this stretch of time.

Trends in the Purchasing Power of Tanzania's Coffee Export Earnings

One of the most important ways by which export commodities contribute to a country's economic development is through their effects on the country's foreign exchange earnings with which the country purchases imported investment goods. This is particularly crucial for a country like Tanzania whose domestic prodcution of capital goods is very limited. Needless to say, the capacity of such a country to make these purchases depends on both the size of the foreign exchange

Chart 7

TANZANIA COFFEE EXPORTS VOLUME, EARNINGS, AND PRICE



Sources: Appendix Tables 7 and 8

8 Squares to the inch

and the value of the earnings relative to the value of the desired import goods. Said in other words, this capacity of a country to import development goods depends in a large measure, on the terms of trade (TOT) or the purchasing power of its commodity exports relative to its imports of development goods. In this section we attempt to assess the terms of trade of Tanzania's coffee export earnings relative to a selected group of its investment goods imports. However, before we describe our empirical results we should make some conceptual and practical observations relating to the results to be outlined hereunder.

One conceptual as well as practical problem around the estimation of these terms of trade, is whether one should use the value index of the country's entire import bill for comparison with the value index of coffee export earnings to arrive at the desired TOT or whether one should use only imports of capital goods. For purposes of long-term policy recommendations, one needs to assess the full potential of coffee export earnings to contribute to the country's imports of capital goods, without undue consideration of existing efficiencies in the use of foreign exchange earnings, a consideration which would favor the use of capital goods alone. The idea here being that the recommendations thus developed would also point to the need to adopt a more conservative and efficient (development-wise) use of foreign exchange earnings. In practice depending on the developmental efficiency with which foreign exchange earnings are expended in the country, a large proportion of export earnings are used to finance the importation of non-development goods including luxuries and petty consumption goods. To the extent that coffee export earnings in Tanzania are used to finance the importatio

of non-development goods, and to the extent that the country's ability to import capital goods is indicative of its development potential, the use of capital goods alone in estimating the said TOT will tend to overstate the potential under the existing foreign exchange expenditure policies. In view of the fact that the ultimate object of the present study is to develop long-term policy recommendations, and since we are unaware of the existence of any long-term series of per-unit indices for Tanzania's imports, and considering that compilation of such an index would be too involved to be undertaken as part of the present work, it has been decided to use a small sample of imported investment goods.

We are then faced with the challenge of selecting a representative set of Tanzania's investment import goods to use in the analysis. As was emphasized in the previous chapter, different sets of goods will yield different TOT indices. Strictly speaking therefore, whatever TOT results we obtain in this analysis will only reflect coffee export earnings power to purchase the set of imports included in the analysis. The extent to which these results may be generalized hinges on the degree to which the set of imported goods included in the analysis is representative of the country's overall investment goods, and their value trends are typical of the country's imported development requirements. This consideration has figured high in our selection of imports to include in the analysis.

Fertilizers and the "cides" (pesticides, fungicides, disinfectants, and cattle and sheep dips preparations) were selected for inclusion

because of the economic importance of agriculture and because these are the main imported agricultural inputs. Given Tanzania's present level of development infrastructural investments form a very important part of the country's total development expenditure. The inclusion of cement, tractors (both of the agricultural and construction types), trucks, buses, and vans appeared representative enough for this category of investments. The inclusion of unmotorized cycles stems from the need to somehow represent a typical peasants' imported consumer durable expenditure item. Admittedly this is a very small range of goods; it appears nevertheless to represent the country's main stream of imported development goods.

In this analysis we have calculated both the commodity terms of trade, otherwise referred to as the net-barter terms of trade (Tc) and the income terms of trade (Ti) for coffee export earnings (Vx) relative to the aforesaid basket of imported goods.

$$Tc_{01} = \frac{Px_{01}}{\bar{P}m_{01}} \times 100$$

$$Ti_{01} = \frac{Vx_1 \; \bar{P}m_{010}}{Vx_0 \; \bar{P}m_{011}} \times 100$$

Where: $$Px_{01} = \frac{Px_1}{Px_0} \times 100$$

$$\bar{P}m_{01} = \frac{1}{6} \sum_{i=1}^{6} \frac{Vmi_1 \; Qmi_0}{Qmi_1 \; Vmi_0} \times 100$$

$Px = Vx/Qx$

Vx = Value of Tanzania's coffee export earnings in million current US dollars.

Vmi = Value of a given good's imports in million current dollars; i = 1, 2, ...,6.

Qmi = Quantity of a given imported good in thousand metric tons or thousand units; i = 1,2, ...,6.

Qx = Tanzania's coffee exports.

1 = Given year.

0 = Base year.

01 = Given relative to base year.

The computational procedure followed in d eveloping these indices is detailed in Appendix Table 9 and the results are reproduced in text Table 20.

TABLE 20

TERMS OF TRADE INDICES FOR TANZANIA'S COFFEE EXPORTS

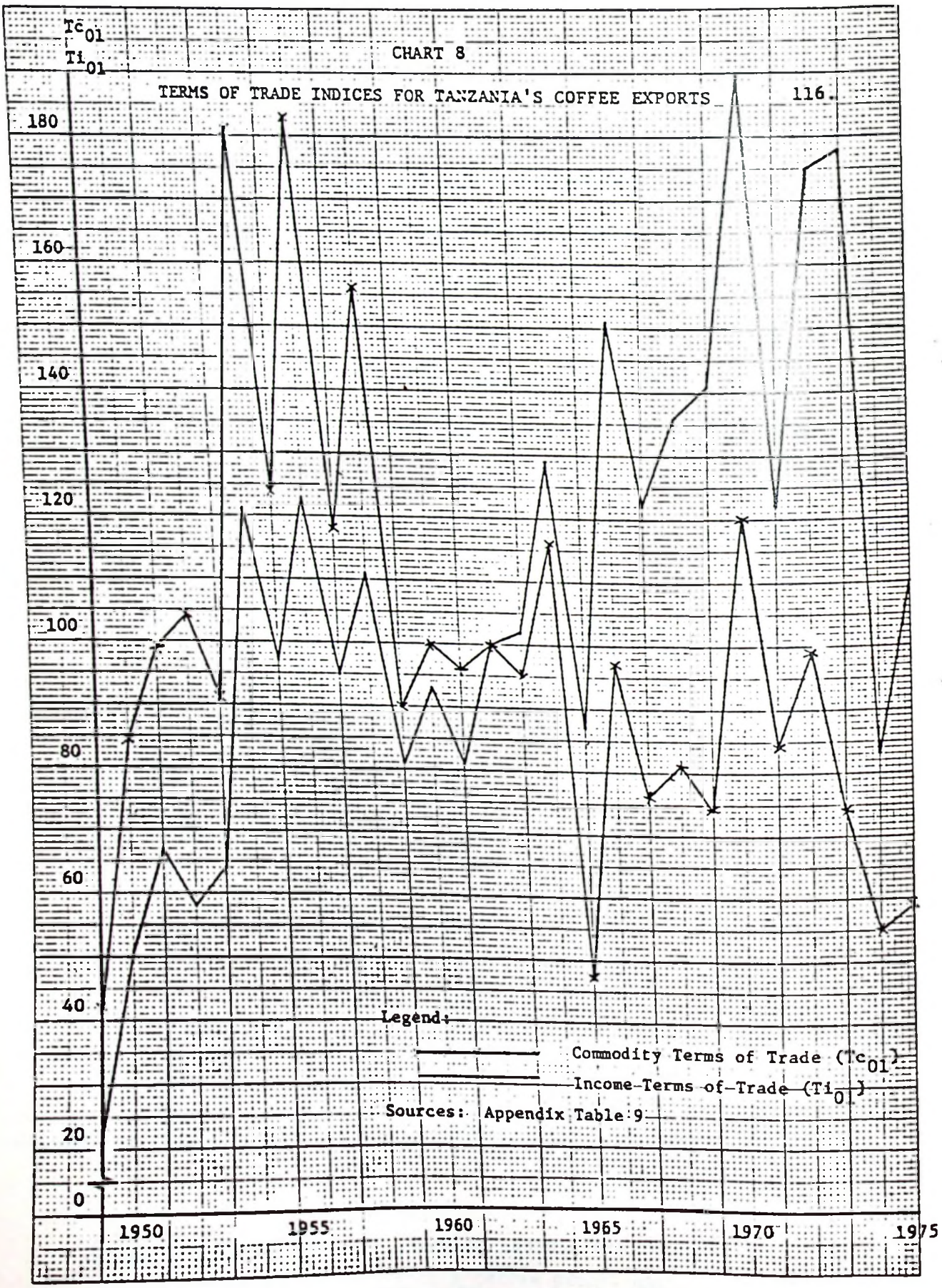
Year	Income TOT	Commodity TOT	Year	Income TOT	Commodity TOT
1955	97	124	1964	129	116
1956	123	183	1965	87	47
1957	95	118	1966	151	97
1958	111	156	1967	122	76
1959	81	90	1968	136	81
1960	93	100	1969	141	74
1961	81	96	1970	190	120
1962	100	100	1971	122	84
1963	102	95	1972	175	99

Source: Appendix Table 9.

These results are plotted in Chart 8. The results clearly indicate a deterioration in the commodity TOT index during 1955-72 --

CHART 8

TERMS OF TRADE INDICES FOR TANZANIA'S COFFEE EXPORTS

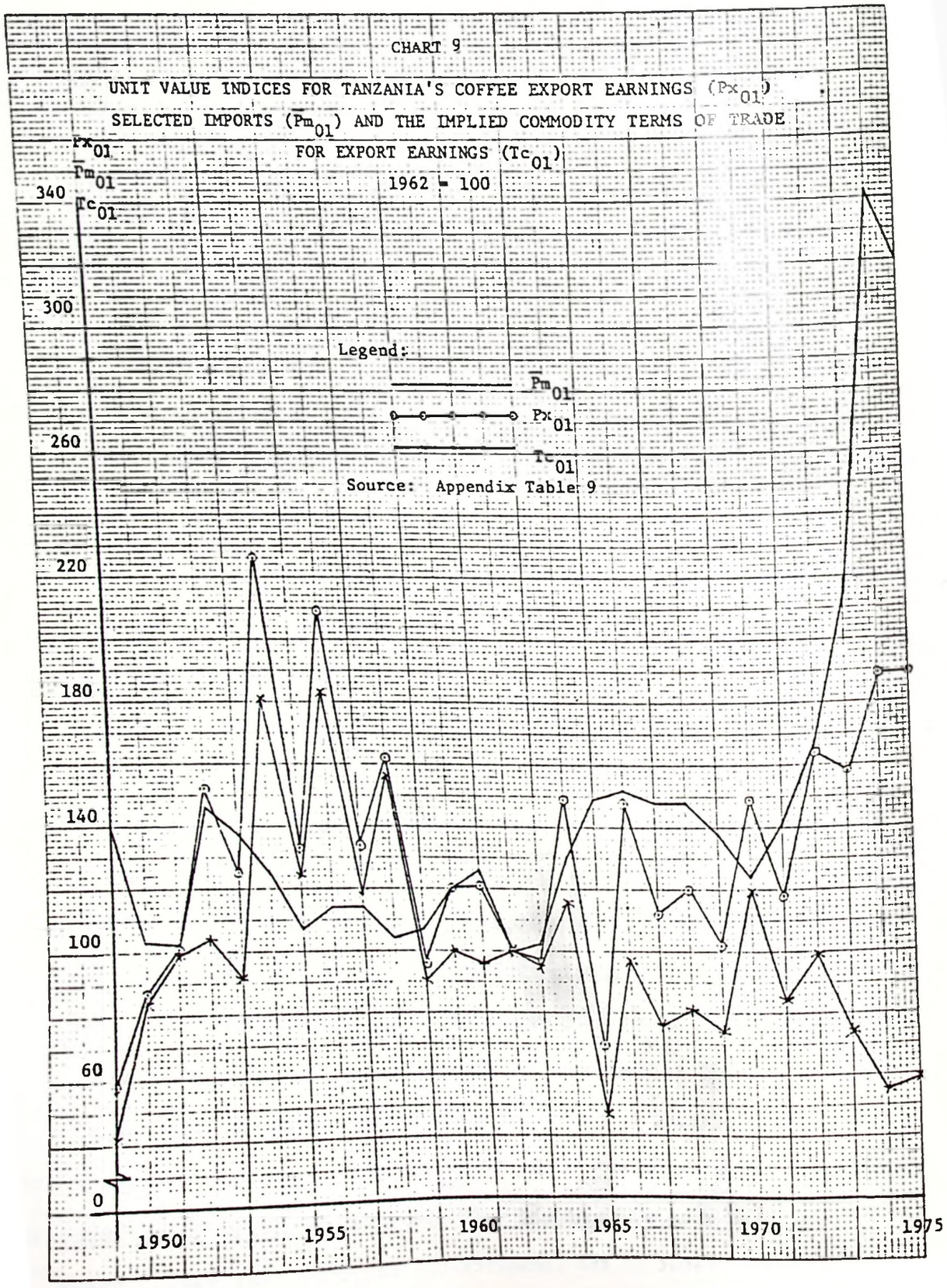


from 124 in 1955 (it was 181 in 1954) to 99 in 1972. In Chart 9 this TOT index is plotted together with the average imports unit value and coffee exports unit value indices, $\overline{Pm}_{01}$ and Px_{01}, respectively. It would appear from this chart that the marked deterioration in these TOT during the mid and late 1950's was mainly the consequence of the fall in coffee prices from their 1954 record highs since during this time the import value index was comparatively stable. This TOT index apart from a couple of spurts during 1962-63 and in 1970, continued to decline to the end of the period under consideration. The upshot between 1961 and 1962 appears to have resulted from a slight decline in the import value index during this period. In 1962-63 the coffee export value index shot up about 30 percentage points mainly it would appear, as a result of a world coffee price increase (see Chart 7) caused in part by a slight frost in Brazil in July 1962 and a more serious one in August the following year. Also during 1963 serious fires and droughts menaced coffee production in Brazil.[12] This increase in world coffee price caused Tanzania's value of coffee exports to rise apparently sufficiently high to cause the commodity TOT index to remain fairly steady during 1963-64 even though the import value index rose sharply during this period. In July 1969 another serious frost hit the Parana region of Brazil causing an estimated 80 per cent damage to the region's 1970-71 coffee crop.[13] This caused a considerable rise in world coffee prices, a rise which was also reflected in Tanzania's value of coffee exports. During this same period of time the import value index declined some and combined with the rise in coffee value index to result in the upshot in the commodity TOT recorded that year. There

CHART 9

UNIT VALUE INDICES FOR TANZANIA'S COFFEE EXPORT EARNINGS (Px_{01}), SELECTED IMPORTS ($\overline{Pm}_{01}$) AND THE IMPLIED COMMODITY TERMS OF TRADE FOR EXPORT EARNINGS (Tc_{01})

1962 = 100



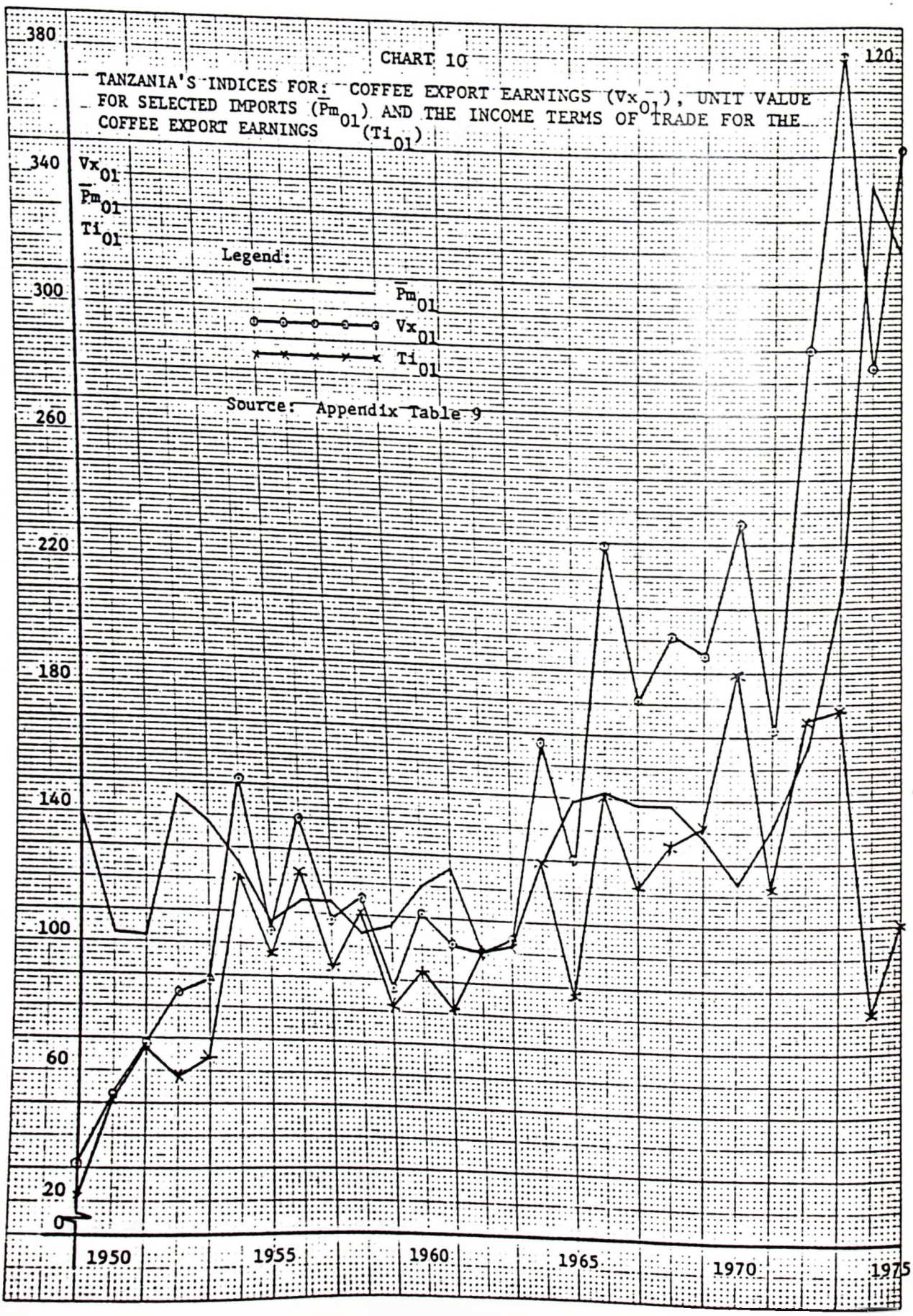
Source: Appendix Table 9

after the TOT index plummeted as the imports value index rose astronomically after 1970.

The situation with the income TOT index is not as clear cut as that of the commodity TOT (see Charts 8 and 10). This index rose considerably with the rising coffee prices of the early 1950's but after the prices peaked in 1954, the index tended to fluctuate along a relatively stable trend until the beginning of the 1970's. Apparently the steady growth in the country's volume of coffee exports managed to keep this TOT index from declining seriously even as the world coffee prices tumbled during the second half of the 1950's, although as is evident in Chart 10 it did decline some. During the 1960's the volume of exports increased even more sharply (see Chart 7). This increase however, coincided with the coming into being of the ICA and its restrictive quota system. Since under the agreement fixed export quotas (basic quotas as they are referred to in ICO literature) were allocated to countries on the basis of previous export performance rather than their production prospects or potential, Tanzania's mid-1960's increase in export capacity did not feature in her quota allocation. In other words, the country's quota proved disproportionate to her newly attained (post 1960) export capacity. The consequence of this is that between 1966 and 1969 Tanzania exported between 19.5 and 38.9 per cent of her total coffee exports to the low priced non-quota markets (see text Table 44). This is likely to have contributed to the rather subdued response of the income TOT to this post 1960 substantial increase in the volume of exports. In 1970 the TOT attained its highest point,

CHART 10

TANZANIA'S INDICES FOR: COFFEE EXPORT EARNINGS (Vx_{01}), UNIT VALUE FOR SELECTED IMPORTS ($\overline{Pm}_{01}$) AND THE INCOME TERMS OF TRADE FOR THE COFFEE EXPORT EARNINGS (Ti_{01})



Source: Appendix Table 9

partly, it would appear, because of the rather marked decline in the import value index that year and a world price increase spurred by the already cited 1969 frost and other bad coffee growing conditions in Brazil.

Instability in Tanzania's Coffee Export Earnings

Instability is defined here in terms of the amplitude of fluctuation or degree of deviation from a market or institutionally determined trend line. Instability is said to have increased when this amplitude is seen to have increased and vice versa. In this study instability is measured by standard deviations (S) from the trend lines fitted earlier.

$$S = \sqrt{\frac{\sum (X - \overline{X})^2}{n}}$$

$$= \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2}$$

Where: X = Variable whose instability is being measured.

$\overline{X}$ = Mean of the data of X under study.

n = Number of items of data under study.

The computer printout for our earlier trend analyses also gave the standard deviations, so that we need not make any further calculations to obtain these deviations. In text Table 21 we summarize the standard deviations from our results.

TABLE 21

TANZANIA COFFEE EXPORT EARNINGS, VOLUME AND PRICE INSTABILITY INDICATORS

	Standard Deviations from the Trend for:			
Period	Vxa	Qx	Pxa	Pta
1955-63	2.75	2.03	9.79	3.26
1964-72	6.50	6.50	8.59	1.65
1955-72	5.55	5.64	8.65	4.46

As these results show, Vxa was more unstable during 1964-72 than it was during 1955-63. This is also the case with Qx, but the situation is reversed with respect to Pxa and Pta indicating that instability in the volume of exports had a more significant influence on instability in Vxa during the two periods than did instability in either of our price variables. This is in conformity with what was stated earlier during our discussion on trends that Qx increased very substantially during the 1960's. As one would be tempted to expect, instability of Vxa, Qx and Pxa over 1955-72 fall somewhere between their respective levels during 1955-63 and 1964-72. Instability in Pta was higher during 1955-72 than it was during the other two periods but apparently with no effect on Vxa instability. This observation is partly explainable by the fact that during 1955-72, Pta ability to explain variation in Vxa was almost nil -- the coefficient of determination when Vxa was regressed on Pta was 1.4, meaning that the two variables changed almost totally independent of each other during this period of time.

Before concluding the chapter we should point out one major concern that may have tended to weaken our analytical results. That concern is to do with the shortness of the series compared -- 9 years on each side of the ICA's inception, seems too short for a good statistical analysis. With more luck in finding enough data, one would suspect that a monthly, quarterly or even half yearly series might yield improved results.

Summary: The Results and the Interaction of Tanzania Coffee Policies and ICA Operations

The foregoing results indicate that the real value of Tanzania's earnings from her coffee exports have generally tended downwards during the period of our central concern. This trend follows from similar trends in the real value of prices, and apparently the rather unimpressive growth in the country's volume of coffee exports. Both proxies of Tanzania's coffee export price, Pxa and Pta, have had negative slopes which are significant at the .05 level for Pta over all the three periods 1955-63, 1964-72 and 1955-72, and for the Pxa during 1955-72. Except for the 1955-63 period, Qx has tended to increase -- the positive slope being statistically significant during 1955-72 and insignificant during 1964-72, but apparently this growth in Qx proved inadequate to offset the marked decline in export prices in real terms, resulting in falling Vxa.

Over the entire period of our study, inflation was increasing, particularly towards the end of the 1960's and during the 1970's, causing our value deflator (Iu) to increase rather markedly, and in turn

depressing our independent variables Pxa and Pta, and the dependent variable Vxa. In addition, Tanzania's ICA assigned export quota proved disproportionate to the country's export capacity, resulting in her having to export large proportions of her coffee to the low priced non-quota markets, thus tending to depress the country's value of coffee exports even further.

The power of Tanzania's coffee exports to purchase imported capital goods did not improve either. Our commodity terms of trade index declined almost monotonically over the 1955-72 period. The trend in the income TOT was not very clear but it definitely did not increase "progressively" during this period or during the operation of the ICA's economic provisions, 1964-72. The causes of these trends are similar to those explained above. Inflation causes import prices to rise thereby depressing the value of coffee exports. This is aggravated by a sluggish growth in the country's volume of exports which fails to offset the damage to purchasing power caused by inflation.

Instability in Vxa during 1955-72 appears to have been more a consequence of instability in Qx than of either of the price variables. Both during 1955-63 and during 1964-72 the degree of instability in Qx and Vxa seems to go hand in hand. The greater instability of the price variables during 1955-63 as compared to 1964-72 does not appear to have perceptibly affected instability in Vxa.

The ICA's resolve to progressively increase the real value of producing countries' income from their coffee exports, is clearly shown not to have been attained in the case of Tanzania. Our trend

results reveal a statistically insignificant positive slope during 1964-72 and the rate of change in that slope was negative. As regards ICA's objective to enhance stability in coffee prices, there is evidence of increased stability in both our price variables -- the standard deviation for both Pxa and Pta were lower during 1964-72 than they were during the pre-ICA period, 1955-63. It is difficult to establish a causal relationship between this increased real price stability and the ICA's operation, however, since the ICA increased the supply of information in the market, it somewhat moderated panic trading in the commodity and thus possibly reduced the frequency and magnitudes of market price fluctuations.

This increased stability in real prices, however, was not translated into greater stability for Vxa whose degree of instability during the operation of the ICA's controls 1964-72, was more than double its level during 1955-63. Again instability in Vxa mirrored instability in Qx whose degree of instability during 1964-72 was more than three times its level during 1955-63. Although it could be said that part of the responsibility for this instability resulted from the ICA's inability to enforce its production controls, most of the blame has to be placed on Tanzania's own production policy, which, as will be discussed later, did not effectively restrict production. In any case, to the extent that this increased instability was a price for increased export earnings, the bargain may not have been disappointing.

The failure to improve or even maintain the purchasing power of coffee is mainly attributable to the ICA's inability or unwillingness to index coffee price goals to the world inflation rate even though the

agreement's object of improving the purchasing power of coffee implied such a move. The results of this is the observed deterioration in the commodity TOT. The indeterminate trend in the income TOT reflect a failure on the part of Tanzania's coffee industry and government to take full advantage of the ICA's inability to enforce production controls and expand production sufficiently to offset the deterioration in real prices which would have helped improve these TOT. As we will argue later given market aggression and proper negotiation strategies, it makes good economic sense for Tanzania to expand her production of coffee even more.

FOOTNOTES

1. G. D. Gwyer. "Three International Commodity Agreements: The Experience of East Africa," Economic Development and Cultural Change, Vol. 21, #3, (April 1973), pp. 466-67.

2. Tanzania is a founding member of the ICA. She was represented by Britain, then the colonial ruler of the country, in the US-sponsored Coffee Study Group on the basis of whose recommendations the ICA was negotiated at the United Nations Coffee Conference in 1962. Tanzania, then Tanganyika, participated in the negotiations as a newly independent nation.

3. In Tanzania typically Mild Arabicas are classified into 17 palatal and aroma classes and 10 physical (size, shape, color, etc.) grades.

4. Tanzania's Hard Arabica crop is a very small proportion of the whole and is in most cases recorded together with the Mild Arabicas. In this analysis the two types of coffee have been combined. The Hard Arabicas are, price-wise, much closer to the Mild Arabicas than to the Robustas.

5. ICO's Indicator price is defined as the simple arithmetic average of the daily New York spot prices of each of Mild Arabicas, Unwashed Arabicas and Robustas.

6. Market Development Bureau (MDB), Ministry of Agriculture, Price Policy Recommendations for the 1978/79 Agricultural Price Review, Annex 10, Coffee, (Dar-es-Salaam: MDB, Ministry of Agriculture, August 1977), p. 13.

7. Albert Vinton, in Coffee Annual 1965, cited by P. Demeire, in a contribution to "The Future of the International Coffee Agreement - A Forum," Coffee Annual, 1969, (New York: George Gordon Paton and Co., 1969), p. 77.

8. MDB., op. cit., p. 17, Table 3.1.

9. Pia is the average of ICO indicator prices for Mild Arabicas, Robustas, and Unwashed Arabicas weighted by the ratios of the volume of the respective types of coffee exported by Tanzania to the country's total coffee exports, deflated by the UN Index of manufactured exports from the developed market economies.

10. Effective quota = country's fixed initial annual quota + adjustments and special export authorizations during a given coffee year.

11. John Neter and William Wasserman, Applied Linear Statistical Models (Homewood, Illinois: Richard D. Irwin, 1974), pp. 255-259.

12. International Coffee Organization, Production of Coffee in Brazil: The Effect of the Frost in July 1975 and Projections of Production, ICO document EB 1396/75 (E), (London: ICO, October 24, 1975), p. 15.

13. "World Coffee Chronology," Coffee Annual, 1969, (New York: K. H. Paton, 1969).

CHAPTER IV

THE WORLD COFFEE MARKET, THE INTERNATIONAL COFFEE AGREEMENTS AND NEW OPPORTUNITIES FOR INCREASED GAINS FROM COFFEE EXPORTS

The ICAs were established to control the international coffee trade by use of three main tools: price objectives, a quota system and enforcement mechanisms, and coffee production controls and diversification. We start our discussion in this chapter with a brief review of these control mechanisms as they evolved through the lives of the first two agreements -- those of 1962 and 1968, and their incorporation into the 1976 agreement.

The 1962 and 1968 ICAs

Price Objectives and the Quota System

These two aspects of the ICA's control mechanism are very closely intertwined and as such are best discussed together. Both the 1962 and 1968 ICAs expressed the desire to attain "equitable" prices for coffee exports, but in neither did the signatories choose to be specific as to just what level of price was "equitable." The closest the agreements came to specifying a price level was the statement we have cited elsewhere, that members agreed on the "necessity of assuring that the general level of coffee prices does not decline below the general level of such prices in 1962."

The agreements, however, left no doubt these equitable prices were to be attained by the imposition of export quotas on all exports to the traditional coffee markets comprising largely of the western market

economies. In establishing the original basic quota, each prospective exporting member was given the choice of the July 1962 United States Department of Agriculture's estimates of exportable production either for 1959/60-1962/63 or for the best two of 1960/61, 1961/62 and 1962/63 coffee years as its base period on which its basic quota was to be calculated. In order to balance world exports and demand, members were required to retain varying percentages of their exportable production[1] in the order:

Exportable Production (bags)*		Percentage Retention
From	To	
0	25,000	0
25 000	500,000	6
500,000	1 million	8
1 million	2 million	10
2 million	10 million	12
10 million and over		30

*Bags here and after refer to 60 kilo bags.

A further one per cent retention was required of all exporting members other than Brazil and Colombia. During the negotiations members of the Inter African Coffee Organization (IACO) who had participated in the short-term (producers only) 1957 ICA, to which we referred earlier, received an additional 350,000 bags export authorization which they shared pro rata.

Tanzania, then Tanganyika, opted for the 1959/60-1962/63 exportable production estimates.[3] Her basic quota therefore worked out as:

Average exportable production for 1959/60-1962/63	448,750 bags
Less 6% retention	26,925 bags
	421,825 bags
Less 1% further retention	4,218 bags
	417,607 bags
Add IACO special allowance	17,851 bags
Basic quota	435,458 bags

We should note that the importance of the basic quota is not so much its absolute size as its implied proportion to the global quota, since this implied ratio forms the basis on which rights and obligations are shared amongst the exporting members.

Under the 1962 ICA about a month before the end of each coffee year, the International Coffee Council (General Assembly of all member countries - hereafter the Council or ICC) was convened to negotiate the following year's price goals, as well as the global and national quotas. The procedure followed in determining the quotas was:

Estimation of total import demand at a price negotiated by the Council

Less

Expected exports from non-member countries

Less

Expected shipments from dependent territories to the governing country

Less

Expected member exports to non-quota markets

Plus or Minus

Expected inventory changes.

↓

Pro rata allocation of quotas to members.

Plus or Minus

Special country export authorizations.[4]

Under this agreement every price and quota change was to be negotiated separately by the Council. This meant that during years of erratic prices the Council had to be convened frequently to negotiate price or quota adjustments, and since the agreement did not provide any substantial price or quota adjustment guidelines, the negotiations were often very time consuming. Furthermore, in the absence of specific guidelines, differing guesses as to the probable outcome of the negotiations often tended to create considerable uncertainty thus aggravating instability in the market. These considerations underscored a growing need for some form of automatic adjustment mechanisms or guidelines.

The first semi-automatic adjustment system entailing the establishof an indicator price range (the simple arithmetic average of the daily New York spot prices) with a ceiling and floor was agreed upon by the Council in March 1965. In this indicator price, the mild Arabicas' price was based on Colombia Mams, El Salvador central standard, Guatemala Prime Washed and Mexico Prime Washed; Unwashed Arabicas on Santos 4; and Robustas on Angola Ambriz 2AA, Ivory Coast Superior 2 and Uganda Native Standard price quotations.[5] Under the system, if the indicator price remained below the agreed floor for 15 consecutive market days, the global quota was reduced. Similarly, if the indicator price remained above the ceiling for 15 consecutive market days, the quota was raised. In both cases the object was to bring the price back to within the agreed range. These quota cuts and increases were

distributed to members pro rata -- in proportion to the ratio of their respective basic quotas to the global quota.

This system had the shortcoming of treating all coffee as though it were a uniform product, ignoring consumers' changing demand patterns for the various types of coffee. This concern was also shared by some producing countries as exemplified in this statement of position:

> We are opposed to a system where the allocation of quota increases on an overall basis result in, for example, in Brazil Santos 4s, with an already well supplied market getting the same proportion increase as Uganda Robustas with an under-supplied market. A country's quota should ideally be linked in some measure to the price performance of its coffee.[6]

In short, what was being sought was a system of selective quota and price adjustments that reflected the changing patterns of market demand for the various types of coffee. Such a system was adopted by the Council, on experimental basis, in December 1965, setting separate indicator price ranges, ceilings and floors as well as quotas for the Mild Arabicas, Unwashed Arabicas, and Robustas, with respective quota adjustments when the indicator prices remained for 15 consecutive market days above the ceiling or below the floor for the individual coffee types. The selectivity system was formally accepted in September 1966 with separate indicator prices set for the Colombia Mild Arabicas, Other Mild Arabicas, Unwashed Arabicas, and Robustas.

The 1968 ICA was very much like its 1962 predecessor, with its various refinements built in. Few modifications were made in the members countries' basic quotas, which were calculated for each country as follows:

Exportable production for the higher of the average of 1959/60-1962/63 or the average of 1961/62-1962/63

Less

Retention shares similar to the ones used for the 1962 agreement

Plus

Provision for increased production resulting from coffee planted before the 1962 ICA came into force

Plus

Adjustments for other factors, e.g., accumulation of surplus stocks and the extent of members' dependence on coffee for foreign exchange (only for countries relying on coffee for 40 per cent or more of their foreign exchange earnings).[7]

Countries whose average quota exports over the previous three years were less than 100,000 bags were exempted from basic quotas. Some country quotas and market shares were substantially changed. Tanzania gained a 34 per cent increase in her basic export quota, from 521,000 bags during the 1962 ICA to 700,000 bags for the 1968 ICA. (The 1962 figure differs from the previously cited basic quota figure of 435,458 bags because the latter figure, 521,000 bags, is based on the 1968 ICA global price quota.)[8]

On the price front, the vague language of the 1962 agreement persisted. The selectivity provisions agreed upon during the 1962 ICA's lifetime were written into the new agreement. The agreement, while allo ing for an unlimited upward adjustment of individual coffee types' annua export quotas, set a 5 per cent limit on the extent to which any such quota could be adjusted downwards. (Article 37, para 2). In the event that any coffee type's indicator price remains below the floor after a whole 5 per cent reduction in the type's quota, the entire annual globa

quota would be reduced so as to strengthen the general level of prices.

To ascertain the compliance of members with their quota obligations, the 1962 required that each coffee export consignment be accompanied by a valid certificate of origin or re-export, indicating the country in which the coffee was grown and its destination. These certificates were to be issued by an agency appointed by each member subject to the Council's approval. A copy of each certificate was sent to the ICO to enable the organization to keep track of each member's exports relative to its allowed quota. In time, however, this control system proved inadequate, due in part to the circumstances of the time.

The lifetime of the 1962 ICA was characterized by widespread surplus production in excess of quota markets import requirements. Therefore, producing countries keen to unload their surpluses directed ever-increasing quantities of their exports to the non-quota markets, either for consumption in those markets or for onward diversion to the quota markets in the form of what came to be known as "tourist coffee". The effect of this was to depress prices in the non-quota (uncontrolled) markets very substantially relative to prices ruling in the quota markets. Singh cites some 1963-65 FAO statistics[9] as substantiating this:

	US $ per bag
Western Europe, Canada and USA (quota markets)	$48.80
Japan (non-quota market)	$42.30
LDC quota market	$39.90
LDC non-quota markets	$32.90

These price differentials provided an opportunity for coffee traders to make money by buying coffee destined to non-quota markets and then diverting it either enroute or re-exporting it from the non-quota country port to quota markets. The situation got so bad that in 1965/66 the ICO estimated that about 2.5 million bags of tourist coffee entred the quota markets without being debited to producing countries' quotas.

In an effort to plug this loophole in the agreement, the Council in 1966/67 set a limit to the volume of coffee each importing member was to allow in form the non-member countries at the level of such improts during 1960-62. In addition, it directed the ICO to issue each exporting member country with export stamps equivalent to its export quota. The stamps were to be attached to each certificate of origin. Importing member countries were required to refuse entry to any coffee consignment not accompanied by a valid certificate of origin or re-export and/or to which were not attached the requisite number of stamps. These new regulations were in addition to the provision in the agreement requiring that exports to non-quota markets be limited to those markets' consumption requirements as estimated by the Council during its process of establishing annual export quotas discussed earlier.

In addition to these measures, the agreement spelled out specific penalties for members who overshipped their quotas. The first overshipment was to be punished by a deduction of the excess from the member's future quotas; the second and third overshipments during a given coffee year were both penalized by loss of twice the overshipment in

its future quotas and a possible loss of membership in the agreement following the third offense. The 1968 agreement embodied all these enforcement mechanisms and made the penalties for overshipment slightly more severe. Now the first overshipment resulted in loss of 110 per cent of the excess, the penalty for the second and third overshipments remained the same as during the 1962 ICA except that the third offense was accompanied by suspension of the member's voting rights pending the Council's decision over whether to require the member's withdrawal from the agreement. While there is little doubt that these enforcement provisions and penalties went a long way towards checking members' massive evasion of their obligations under the agreement in the scales experienced during the mid-1960's, it will be erroneous to say that these, or indeed any other measures, were or could totally eliminate some forms of cheating.

In the 1962 ICA, members undertook to adjust their production of coffee to a level equal to the total of their domestic consumption needs, exports, and stocks, the level of which was to be prescribed by the Council. Implementation of this production adjustment was, however, left completely in the hands of each exporting member. This was tantamount to differing action on the over-supply problem. In Fisher's words, "the agreement seemed to promise action while legally providing none."[10] This is particularly so since the Council never got around to prescribing a stocks level or policy.

The 1968 ICA, as well as reiterating the undertaking to bring production into line with demand, required each producing member to submit for the Council's approval a production plan aimed at accomplish-

ing the undertaking. In the event that the Council disapproved a member's production plan, the Council was to prescribe a plan for that member. Once approved, each producing member retained responsibility for implementation of its plan but was required to submit regular progress reports to the Council. Failure by a member to take adequate steps to implement the plan was to be punished by denial of future quota increases.

To assist countries in meeting their production goals, a diversification fund (hereafter the Fund) was established with a compulsory 60 US cents payment for each bag actually exported to quota markets in excess of 100,000 bags, plus voluntary contributions by importing members and any of those exporting members whose exports were less than 100,000 bags. The intention was for the Fund to finance projects geared towards the absorption of production resources away from the production of coffee. Twenty per cent of the Fund's monies was to be paid in freely convertible currencies for use in financing Fund approved projects in any exporting member country. A small additional payment, also in convertible currencies, was earmarked for the Fund's operating expenses. The balance was to be contributed in the currency of each participating member, for use in that member's territory for financing projects approved by the Fund.

While many will agree with Law's 1975 observation that the Fund was a meaningful effort in combating the surplus problem in coffee, few will go so far as to agree with him that of late coffee stocks have begun to be reduced as a result (of the Fund).[11] The reduced stocks level, even in 1975, was more a consequence of natural and socio-

political phenomena, particularly adverse weather conditions and civil strife, as well as autonomous national diversification efforts in major producing countries, than of the Fund's operations. (For an argument in support of this assertion, see Appendix Table 16 and the accompanying notes.) This implied poor impression of the Fund's performance as measured against its intended objectives should not have come as a surprise in view of the narrow perspective of diversification adopted under the Fund's program. Diversification was simply conceived as the opening up of alternative areas of economic activity, usually agricultural, in the coffee producing regions, to which land and people actually producing coffee would be diverted, resulting in the contraction of coffee production. This, however, is an oversimplified and superficial view of the problems because, as Streeten and Elson point out:

> The abundance and low opportunity costs of many factors engaged in coffee production are the result of genral underdevelopment.
>
> . . . . . .
>
> Where there is underutilized labor and uncultivated land, such as on the latifundia in Latin America, and in Tanzania, a coffee farm can easily produce more of other types of crops without reducing its output of coffee.[12]

They argue, therefore, that diversification should be conceived in the context of an overall national economic development strategy because "successful development,...will create the conditions in which it will be easier to contract the production of coffee." In this sense, therefore, activities and investments in the entire country, both in the agricultural and other sectors, should be considered in diversification programs, if such efforts are to have a reasonable

chance of success.

Quest for Flexibility and Development of the 1976 ICA

We have argued before that agreements of the type that the ICAs are tend primarily to protect the interests of the senior parties to such agreements. This argument is substantiated by the consistent search for flexibility in the ICAs' quota system by the small, and especially African, producing countries. During the UN Coffee Conference in 1962, members of IACO, with the support of Britain, France and some other consuming countries, strongly advocated the setting of separate price ranges for the various types of coffee, as well as a system of quotas that would allow for adjustment of individual coffee type quotas in accordance with those types' respective price movements.[13] These efforts, however, failed because they ran counter to the interests of Brazil and some of the other Latin American producing nations who, with the support of the United States, preferred a very rigid quota system. Such a quota system would guarantee the maintenance of the Latin Americans' already established market shares against the growing threat from African producing countries.

The United States supported a rigid quota system, reportedly because she believed that such a system, more than any other, was more certain to bring about the desired price increase.[14] In adapting this position, which was contrary to its previously expressed policy, in favor of quotas that would not freeze coffee trade at the pattern prevailing at the start of the agreement, as well as maximizing

consumers' freedom to choose between the various types of coffee,[15] the United States appears to have been motivated more by concerns over the political consequences of a further decline in Latin American foreign exchange earnings from coffee[16] than by genuine economic rationale.

During the 1976 ICA negotiations again the Latin Americans, Brazil and Colombia in particular, maintained their preference for rigid quotas while the Africans continued to push for flexible quotas. The United States came out strongly in favor not only of a more flexible quota system, but also a system that would over time reallocate production and export capacity in favor of the more efficient, low cost producing countries.[17] The result of this realignment of the US position with that of the emerging exporting countries is an agreement, 1976 ICA, more akin to the interests of the Africans and the other relatively new producers than were either of the previous agreements.

The 1976 ICA: Innovations and Modifications

In common with its two predecessors, the 1976 ICA is based on quota restrictions and price objectives. However, this agreement contains several improvements over the previous two and has a number of features not found in its predecessors. Together these innovations and improvements are intended to make the agreement more enforceable and effective in fulfilling its objectives. In the next few paragraphs we discuss the agreement, paying particular attention to the new features and improvements.

The agreement requires that the Council establish a system of indicator prices comprising a daily composite price, a composite price range, and a price range for each of the major types of traded coffee. In establishing and adjusting these price objectives, the Council will consider:

- the levels and trends of consumption and production as well as stocks in importing and exporting countries;
- changes in the world monetary system;
- the trends of world inflation and deflation; and
- any other factors which might affect the achievement of the objectives set out in this agreement.[18]

These considerations imply a mild form of indexation of coffee price objectives to the rate of inflation and changes in the world monetary system, a most welcome proviso considering that it was the devaluation of the dollar in 1971, and consuming countries' refusal to accept a price adjustment that would compensate the producing countries for their loss of income resulting from the devaluation, that triggered the collapse of the 1968 ICA in 1972.[19] Underlying the first consideration above has been the need to set price goals that reflected most closely the actual (rather than paper) coffee supply and demand situation in the market, and therefore reduce grounds for speculation, thus enhance the stabilizing ability of the agreement.

Unlike either of its predecessors, the new agreement came into force without an active quota system; the quotas are in suspension. This agreement has an inbuilt automatic trigger mechanism to activate and de-activate the quotas when agreed price levels are reached.

Initially, when the council has not established price ranges, the quota system will be activated when the average of indicator prices for the Other Mild Arabicas and Robustas drops and remains, on average, at or below its level during the calendar year 1975 for 20 consecutive market days. Alternatively, the system may be triggered into force when the composite indicator price drops by 15 per cent below its level during the preceding coffee year and remains there, on average, for 20 consecutive market days. This later condition becomes effective only if prices are 22.5 per cent or less above their levels in 1975 (Article 33). The US Treasury Department has estimated these trigger price levels for the two conditions of quota activation to be 63 and 77 cents per pound, respectively; levels which the department believes are very unlikely to be experienced before the 1979/80 coffee year.[20] In the event that price ranges have been established, quotas will be triggered when the composite indicator price remains, on the average, at or above the agreed ceiling for 20 consecutive market days.

Barring a Council decision to the contrary, quotas will be suspended when the composite indicator price remains, on the average, for 20 consecutive market days 15 per cent above the ceiling price, if indicator price ranges have been established. If no such ranges are in force, quotas will be suspended when the composite indicator price remains, on the average, for 20 consecutive market days, 15 per cent or more above its level during the previous calendar year (Article 33). These trigger prices were scheduled to be reviewed before September 30, 1978 and again before September 30, 1980.

As was the case with the previous two agreements, market sharing remains based on a system of basic quotas. Each country exporting more than 400,000 bags, is assigned a basic quota. In calculating this quota, each eligible member is allowed to choose between its average actual exports for 1968/69 to 1971/72 and 1976/77 to 1977/78, as its calculation base. These expott figures are those compiled by the ICO on the basis of the organization's record of each member's certificates of origin, which as was the case in the previous agreements, are required for all coffee exports from member countries with copies submitted to the ICO (Article 30).

When quotas are in force, the Council at each last regular session of each year, sets a global annual quota considering:

a) estimated consumption in the importing countries;

b) estimated imports of members from other importing member countries and non-member countries;

c) estimated changes in inventories of importing member countries and free ports;

d) adjustments for reported shortfalls and redistribution of the same; and

e) for introduction or re-introduction of quotas, exports of members and non-members during the 12 months before such introduction or re-introduction (Article 34).

A new innovation in the 1976 ICA is the division of the annual global quotas, net of the expected exports from the members exempted from quotas, into fixed and variable parts -- 70 and 30 per cent,

respectively. The fixed part is allocated among eligible exporting members according to their basic quotas, while the variable part is distributed to members on the basis of a ratio between each member's verified stocks during the previous year to total verified stocks of members eligible for quotas, with the limitation that on one member will receive more than 40 per cent of the total of this variable part (Article 35).

We should note here some implications of the criteria followed in allocating quotas. The provision allowing members to base their basic quotas on their exports performance during the first two years of the coming into force of the agreement, 1976/77-1977/78, is intended to act as an incentive for members to increase their exports during these years, partly in order to maximize their basic quota allocations when quotas come into force and partly to hasten recovery from the continuing inadequacies of supplies. This incentive is likely to have led to increased investment in production, particularly in the form of production inputs such as fertilizers and pesticides as well as cultural practices that are likely to result in short- to medium-term increases in yields. The increased production resulting from these investments will find its way to the market almost immediately upon harvesting, since exporters have incentives not to withhold coffee from the market -- the prices are still good and there is the opportunity of expanding future market shares. The basing of basic quotas on ICO's records of certificates of origin rather than the USDA estimates should prove a disincentive for members to export around the quota

A point, the implications of which we will cultivate next, is the absence in the current agreement of a commitment to production controls or diversification requirements. Both the previous agreements, althoug unable to effect any meaningful production control or diversification program, at least gave some lip service to these ideas (see ICA 1962 and 1968, Article 48). Under production policy, the new agreement merely expresses the producing countries' undertaking to adopt and implement a production policy. The agreement leaves it for each member country to define its own production policy and provides that the Council may establish procedures for coordinating the said country production policies (Article 50).

Our empirical results and discussion this far lead one to believe that Tanzania could improve the size and predictability of her earnings from trade in coffee by adopting a production and export expansion policy. But before one can recommend such a strategy, it is necessary to evaluate the trends and prospects of consumption and production in the major consuming and producing areas. This is particularly important in view of the frequent reports of declining coffee consumption in some countries and Brazil's warning that she was going all out to recover her "traditional share in the world coffee trade" and that,

> Those who doubt this - and who consequently may be encouraged (by the current shortage of coffee) to initiate uncontrolled new plantings - will be gambling on a doubtful hunch with dramatic consequences for all producers.[22]

Trends in Coffee Production in Africa and Latin America

Brazil

Reference to text Table 22 makes one wonder just what Brazil's "traditional" share of the world coffee trade really is. We noted earlier that Brazil's coffee output in 1906/07 was equivalent to 85 per cent of the world total. Text Table 22 shows that this country's share of world exportable production during 1946-50 was 50 per cent and dwindled to 22.4 per cent during 1971-75. This trend has continued in spite of the country's repeated statements of commitment to regain her eroding export capacity.

Geer argued at the beginning of this decade that the future potential of Brazil's coffee export performance would depend not only on the rate of replanting and expansion but also on the country's farmers' additional ability to rehabilitate trees damaged by frosts and droughts.[23] This prediction was made hardly a year after the 1969 frost in Brazil. Since then two serious frosts, one in 1972 and the other in 1975, have hit. A more mild one was reported in August, 1978. The exact extent of damage of this latest frost has been the subject of dispute with estimates ranging from loss of 1-6 million bags of the 1978/79 crop.[24] To the extent that Geer's prediction holds, it would appear that the frosts are occurring much too frequently for the country's farmers to catch up with the rehabilitation work; replanting has reportedly been continuing since after the 1969 frost.

We intend to pursue the issue of increasing frequency of frosts and other adverse weather conditions further, but first we wish to

TABLE 22

EXPORTABLE COFFEE PRODUCTION TRENDS: BRAZIL, THE REST OF LATIN AMERICA, AND AFRICA

Five Year Averages 1946-50 to 1971-75

	World	Brazil		Others L. America		Africa	
	(mn. bags)	(mn. bags)	(% world)	(mn. bags)	(% world)	(mn. bags)	(% world)
1946-50	27.6	13.8	50.0	9.8	35.5	3.6	13.0
1951-55	32.3	14.7	45.5	11.3	35.0	5.6	17.2
1956-60	48.5	23.4	48.2	14.2	29.3	9.4	19.5
1961-65	51.4	18.8	36.6	15.9	30.9	14.4	28.0
1966-70	50.8	15.0	29.5	16.4	32.3	16.9	33.3
1971-75	50.8	11.4	22.4	18.2	35.8	18.6	36.6

Sources: USDA, Foreign Agriculture Service:
1946-73: Final Published Figures.
1974-75: Foreign Agriculture Circular, FCOF-4-77, October, 1977.

focus attention on some other factors that have tended to cause Brazil's production and exports to head downward during the last three decades, and are likely to continue to hamper the country's coffee production in the future. Schuh notes that between the end of the Second World War and 1964, the Brazilian economic policy emphasized import substitution industrialization (ISI) and tended to ignore agriculture, resulting in virtual stagnation of that sector during the period.[25] The situation with coffee was worsened by the very low level of world prices and Brazil's large burden of surplus stocks, factors which combined to contribute to the country's policy of subsidizing eradication of coffee trees during 1962-64 and 1966-67.[26] At the same time alternative commodities including maize and especially soybeans were relatively better priced and easier to produce. Their production could be more easily and fully mechanized and, being annual crops, production plans were more flexible. Switching to soybeans became even more attractive when in June, 1973, President Richard Nixon placed an embargo on soybean exports from the United States. The embargo hurt the Japanese rather badly since they depended on the US as their major source of supply. They therefore eagerly helped finance Brazilian farmers to switch to soybean production. Many Brazilian farmers were willing to bulldoze their coffee trees and replant the fields with soybeans, maize or other crops, rather than expand production further into the frontier because, Maidenberg notes, good viable land is limited as much of the Amazon basin has been leached of nutrients by fierce sun and rains.[27] Expansion into the frontier therefore means

moving into marginal lands that are more difficult and expensive to bring into economic production, particularly considering the recent increases in the costs of fuel, fertilizer, and essential materials and equipment.

Another factor contributing to Brazil's loss of production in recent years has been the rather serious and widespread outbreak of the coffee rust fungus, Hemileia Vastatrix, discovered in the country in 1970 and which by 1972 had precipitated the necessity of destroying and replacing about 600 million coffee trees.[28] In a Brazilian Federal Government funded coffee renovation program that followed the outbreak of the coffee rust fungus, during 1972-74, and which entailed the subsidization of new coffee plantings, more assistance was given to farmers in relatively frost-free areas, especially in the state of Minas Gerais, thus directing investment in coffee away from the frost-prone states of Parana and Sao Paulo.[29]

The US general Accounting Office (GAO) reports that about 50 per cent of Brazil's cost of coffee production is labor costs, while fertilizers and other chemicals for controlling disease and pests form the next most important production cost component.[30] The report notes that the daily farm wages ranged between $3.76 and $7.52 in 1976 and proceeds to cite IBC (the Brazilian Coffee Institute) statistics, which indicate that the cost of producing one 60 kilo bag of clean coffee increased from $39.02 in 1975/76 to $52.91 in 1976/77 and $82.16 in 1977/78.[31] One would usually treat official statistics on a sensitive subject like this with some suspicion -- the IBC has a negotiating

interest in inflating coffee production costs, while the Comptroller General would have an interest in deflating these costs so as to strengthen his argument that the ICA and coffee producing countries had unjustifiably raised prices above the market trends. However, in the present case such manipulation does not appear to have occured. Woodland noted in 1974 that it takes 8-10 mandays of work to produce one 60 kilo bag of clean coffee in Brazil.[32] He noted that farm wages in coffee producing countries varied between $.50 and $3.00 per day. These figures agree with the lower limit of the Comptroller General's wage level estimates for Brazil. The figures do not differ dramatically from those given by the IBC - taking GAO estimate of 50 per cent labor share of the costs of producing coffee (this need not be correct -- Woodland estimates a 60-80 per cent labor cost component), and the mid-points of GAO's farm wage estimates and Woodland's manday requirement ranges, i.e., $5.53 = (7.32 + 3.76)/2, and 9 mandays, respectively, one notes that even IBC's production cost estimates are conservative.[33]

When all these factors are considered together with the fact that Brazil has, since the mid-1960's, been going through an economic boom of sorts, it does not appear surprising that the relative economic importance of coffee in that country has deteriorated drastically in recent years. This declining trend is depicted in text Table 23. This table tends to lead to the conclusion that the declining importance of coffee in Brazil is a continuing long-term trend rather than merely a transitory one resulting from, say, the 1975 frost.

TABLE 23

BRAZILIAN COFFEE EXPORT EARNINGS AS
A PERCENTAGE OF TOTAL EXPORT EARNINGS

Year	Per cent	Year	Per Cent
1966	44.4	1971	28.3
1967	44.3	1972	26.5
1968	42.4	1973	21.7
1969	36.7	1974	12.3
1970	35.9	1975	10.8

Sources: 1966-73: Cheryl Payer, (ed.), Commodity Trade of the Third World, (London: MacMillan, 1975), Table 7.1, pp. 156-7.

1974-75: Pan American Coffee Bureau, Annual Coffee Statistics, (New York: PACB, 1975 and 1976), Chart 9.

The Rest of Latin America and Africa

As is evident from text Table 22, Latin American coffee producing countries other than Brazil have maintained a steady share in world exportable coffee production. However, trends and prospects in different countries differ rather remarkably. Colombia, the world's second largest coffee exporting nation, exports mild Arabicas named after it, "Colombian Milds." De Vries estimates that the country's coffee production grew at about 1.6 per cent per annum between 1947/48 and 1972/73. This rate of growth, de Vries estimates, is about twice the average for South American including Brazil and about one half that of North and Central America, 0.8 and 3.3 per cent, respectively.[34]

However, since the 1969 and 1972 frosts in Brazil, Colombia sensed that Brazil's share of the market was destined for a nose dive and decided to take the opportunity to expand its own production to 11.4 million bags by 1980,[35] a 46.2 per cent increase over its 1968/69 to 1972/73 average production of 7.8 million bags. The Comptroller General's report notes that while the country is currently utilizing only 1.1 million hectares of its available 4.8 million hectares of land suitable for coffee, the Colombian National Federation of Coffee Growers, the country's supreme coffee authority, aims at attaining this production goal mainly through increased productivity. This will be brought about by replaning higher yielding varieties, fertilizer and disease and pest control chemical applications and a modest 30,000 hectare expansion during 1978/79 and 1979/80. The Federation has set aside some $80 million for low interest loans to growers for this purpose.

We should note that Colombia consumes about 17 per cent of its production (average of the difference between the country's total production and exportable production between 1966/67 and 1972/73 - USDA final published statistics) so that a very large proportion of any increase in production will find its way into the export market. The potential for further production expansion is considerable, in view of the available suitable land and the country's lower farm wages relative to those paid in Brazil -- ranging between $1.55 to $2.52 per day in 1977/78.[36]

Amongst the other major South American producers — Peru, Ecuador and Venezuela, Peru has experienced the fastest growth rate

in its exportable production, 11.7 per cent per year between 1947/48 and 1972/73 but since then the tempo has moderated and exportable production is leveling off at about 0.8 million bags. The Ecuadorean exprotable production fluctuated rather wildly during 1947/48 to 1972/73. De Vries estimates that during this period, production grew at 6.5 per cent per annum.[37] Venezuela's exportable production seems to be in limbo, particularly in recent years possibly as a consequence of the reduced attention given it in light of the overriding importance of oil in the nation's economy. As was the case with Ecuador, no major expansion programs have been reported.

Mexico, El Salvador, Guatemala and Costa Rica are the most important exporters of coffee in Central America. According to De Vries, the rate of growth of production in the region between 1947/48 and 1972/73 has been 3.3 per cent annually, with Costa Rica and Mexico leading in growth rates at 6.2 and 5.4 per cent per annum, respectively.

Currently Mexico has a major coffee expansion program in progress. The country has allocated some $200 million to finance low cost loans to growers for replanting of coffee fields with a newly developed coffee variety, reported to be capable of yielding five times as much as the varieties now in use. The loan funds will also enable growers to purchase fertilizers, pesticides and pay for other improved production techniques over the 7 years ending in 1984.[38] Mexico's object is to raise her present level of production of 4 million to 7 million bags but without increasing her acreage under coffee. Currently the average coffee yield in Mexico is 600-660 kilos per hectare as compared

with 1260 kilos per hectare in Costa Rica;[39] so obviously there is the possibility of realizing the increase contemplated in Mexico.

Nicaragua, one of the relatively smaller exporters in the region, started on an expansion program in 1976 with the object of doubling its 1976/77 production of 1 million bags by 1980.[40] However, the continuing political uneasiness in that country sheds some doubt as to the attainability of this goal. Guatemala has an ongoing expansion program geared to doubling output from its 2.5 million bags level in 1976/77 by the early 1980's. Honduras, another one of the smaller producers, is also contemplating a major increase in her production. In all these countries emphasis is on increasing productivity rather than expanding acreage.

In El Salvador most of the land that is suitable for coffee is already being used so that expansion of the coffee area is virtually out of the question.[41] The only avenue for increasing exports is therefore increasing yields, but El Salvador already averages about 1000 kilos (about 17 bags) to the hectare[42] -- the GAO report estimated 20 bags per hectare for El Salvador as compared to 8.2 bags in Brazil and 9 bags in Colombia. In short, there does not appear to be much of a chance for increasing output economically in this country although the GAO cites reports of yields of up to 48 bags to the hectare obtained by heavy fertilization on an experimental basis.

Presently there is considerable concern in this area about the possible spread of the coffee rust fungus which has already invaded Nicaragua.[43] It is estimated that it costs about $284 per hectare to keep the fungus under control, but even at these costs it is believed to be economically more sound to treat than to replace the damaged

trees.[44] Another cost related problem facing coffee production in Central America is high labor requirements per bag of coffee. Woodland reports that in Costa Rica, Mexico, and El Salvador to produce a 60 kilo bag of clean coffee requires on average, 15 mandays of work as compared to 8-10 mandays in Brazil, mainly because of the topography (mountainous) in the coffee growing areas in this region.[45] A further contributing factor to the high labor requirements is the practice of picking coffee cherries one at a time, which is common in these countries which produce mild coffee. This harvesting practice differs from that of stripping virtually whole brances at a time, which is usually employed in harvesting hard coffees (Unwashed Arabicas and Robustas). This latter practice is acceptable for the hard coffees since their primary processing (sundrying of cherries) does not require that cherries by completely ripened before they are harvested. The mild coffees have to be pulped (wet-processed),[46] a process which requires that the cherries be completely ripe before harvest. It is also likely that farm wages in this region will be closer to the upper end of Woodland's estimated range of $.50 to $3 per day cited elsewhere. This is due to the relatively higher living standards in these countries than in many other producing countries in the world.

African coffee production has been gaining considerable ground over the years. De Vries estimates the annual average rate of growth for Africa's coffee production between 1947/48 and 1972/73 to have been 7.2 per cent. At the same time Africa's share of world exportable production has nearly trebled since the end of the Second World War

(see text Table 22).

The Ivory Coast, Africa's largest exporter, is also the world's third largest. The country's coffee is almost exclusively Robusta although they are currently involved in the experimental production of a crossbreed between Arabica and Robusta called "Arabusta", which is said to have the hardy properties of Robustas and the mild taste and low caffeine content of the Arabicas. It is believed that it will be about 1985 before Arabusta can be sufficiently perfected and produced in marketable quantities, about 5,000 metric tonnes.[47] About 98 per cent of Ivorian coffee is produced by smallholders on plots of 2 to 5 hectares each on average. The remainder is produced in large private estates. In its 5-year Development Plan covering 1971-75, the Ivory Coast initiated a program to increase production form its 1968 level of 3.8 million bags to 4.4 million bags by 1975 and 6 million bags by 1980.[48] Following the recent coffee price boom, the Ivory Coast government has renewed its efforts to promote increased production primarily through increased yields by encouraging the planting of higher yielding varieties, greater use of fertilizers and better cultural practices. The average yield is currently about 5 bags clean per hectare with 40 mandays of labor input. While under ideal conditions the country's present variety of Robusta coffee is estimated to have the potential of yielding 13 bags to the hectare, the labor requirement for such a yield would be prohibitively high, about 200 mandays per hectare, yielding an even lower output per manday than the present less sophisticated production methods.[49] In its current effort, the govern-

ment is working at increasing yields to about 17 bags per hectare. This effort is intended to lead to the attainment of its 5-Year Plan objectives of 6 million bags by 1980.

Two major bottlenecks stand in the way of large scale production expansion in the Ivory Coast. The first is the amount of suitable land available. For climatic reasons, coffee can only be grown below the eighth parallel, in which region coffee must also compete with other commodities, subsistence and cash. Since 1975, for example, the Ivorian government, presumably motivated by higher cocoa prices over Robusta coffee,[50] has been encouraging expansion of cocoa production by paying producers of cocoa a 60,000 francs CFA ($267) premium per hectare for expanding acreage. As a consequence, cocoa expansion has been undertaken at the expense of coffee.[51] The second major bottleneck in the country's coffee production is the limited availability of labor. In the Ivory Coast after the cherries are picked, they are dried on the floor and then hulled on or in the vicinity of the farm. This last task is very labor intensive, and given the country's labor shortage, heavy reliance is placed on unreliable seasonal labor from neighboring Upper Volta and Guinea. Because of the labor problem, it has been estimated that about 20,000 metric tons of cherries went unharvested in 1976. To alleviate the bottleneck at the hulling stage, the government presently operates one central hulling plant and has plans to construct 20 more such plants to handle the entire crop, thus mitigating the labor constraint and allowing farmers to concentrate on increasing production. The plants would also reduce the number of

beans broken during processing by about 75 per cent and thus increase the volume of coffee suitable for export by about 0.7 million bags without any increase in production.[52]

Two of the other major Robusta producing countries in Africa, Angola and Uganda, are currently going through some political and social adjustments which may limit their capacity to expand production for some time yet, even though they both have large expansion potentials. Production in the other major Robusta producing African countries, Cameroun, Zaire, and the Malagasy Republic (Madagascar), each of which exports over a million bags of coffee per annum, has more or less reached a plateau for several reasons. In Cameroun, production expansion was particularly rapid during the late 1950's and early 1960's, but since then little additional planting has taken place and production has stagnated thereafter. There was a small rise in production (of Arabica which forms about a third of the country's total) between 1968 and 1972 as a result of a foreign aided fertilizer project, but when the aid contract ended the inadequacy of local follow up caused production to slip to its previous levels.[53] The prospects of increased production in the near future are limited partly by competition between coffee and other commodities, particularly food crops for family resources - labor in particular, since about 95 per cent of the country's coffee production is on smallholder scale.

Production in Zaire has had considerable ups and downs over the last two decades. In 1959 production reached 1.5 million bags, but as a result of that country's post-independence problems, production

dwindled to 0.5 million bags in 1966. Some recovery occurred between then and 1972, at which time the government promulgated the reversion of all foreign owned plantations to Zaireans and the formation of a single national coffee agency, the Office National du Cafe, to control the cultivation and marketing of coffee, including transportation, processing and exportation all of which are now in local hands.[54] As might have been expected, a major reorganization of the industry of this scale has had a short-term, at least, stagnating effect on production and has created a considerable uncertainty as to the prospects of future expansion.

Coffee has been described as a "backyard fruit crop" in the Malagasy Republic because most growers plant only between 50 and 60 trees around their homes. Very few farmers, it is reported, have more than 200 trees.[55] In 1966 the government, with some foreign assistance, initiated a program to expand production by 40 per cent from its level then of about 0.8 million bags, using only about a third of the existing coffee acreage. The primary idea was to take land on the east coast, to the north of Tamatave, out of coffee by providing growers in the selected areas with a newly developed clonal planting material at subsidized price and other necessary financial assistance. Eventually the project aimed at concentrating production in the hands of progressive farmers, each operating about one hectare of some newly planted clonal material capable of yielding about 17 bags per hectare, about four times the present national average. Farmers thus phased out of coffee production were to be encouraged to plant alternative crops including

bananas, cocoa, cloves, vanilla, oil palm and pineapples.[56] The program has, however, run into some major snags, not the least of which has been the inaccessibility of some producing areas due to poor communication network (absence of roads). Furthermore, under the program only 2,000 hectares per year can be planted with the new clonal material and, given the present organization of production, prospects for increased output in the near future are limited.

The major African Arabica producers are Ethiopia, which produces Unwashed Arabicas, Kenya and Tanzania, both of which countries produce predominantly Colombian Mild Arabicas, and Burundi and Rwanda producing Other Mild Arabicas. In Ethiopia[57] over 80 per cent of the coffee crop is harvested from natural coffee forests or replanted forest seedlings. Most of the crop was, until recently (following the overthrow of the monarchy in 1974), produced or collected by tenant peasants on somewhat precarious cropsharing arrangements with their usually absentee landlords. The imperial government and the National Coffee Board have deliberately refrained from encouraging cultrual practices that could increase production possibly above what they could market under the then existing market conditions.

Ethiopia's potential to increase production is enormous. The ecological conditions are close to perfect but bottlenecks stand in the way of rapid progress towards the realization of this potential. Probably the main bottleneck right now is the fluidity of the political situation since the overthrow of the monarchy. It is interesting to note, however, that in spite of the present political situation in the

country, production has remained steady. The other major bottleneck to production in Ethiopia is poor communication network rendering many coffee forests inaccessible for exploitation. Previously the absentee landlord/tenant production structure did not provide adequate incentives for increased production. The coffee authorities have focused attention on encouraging farmers to wet-process their coffee so as to improve the quality and thus maximize foreign exchange earnings from the current level of exportable production. While the immediate future does not appear to promise much progress in the way of increased output, we should note that the future of the industry in Ethiopia depends on the developmental attitude of the new government after it has settled down. The change opens enormous possibilities for progress, but only time will tell the direction of the change.

Kenya's coffee industry[58] is a technical showplace for Africa -- the yields are very high (900-1100 kilograms per hectare) and its coffee quality is excellent, but the industry's expansion potentials have a low ceiling. Additional coffee land is limited so that further increases in yields are the major hope for expanded production. However, production per hectare is already very high, leaving increases in plant population as the major alternative. This alternative is not without problems. Kenya's rainfall is generally inadequate even to support the present level of plant density; increasing such density will call for even greater irrigation than has been the case hitherto. This in turn will further aggravate the costs of production, already very high due to high and rising cost of increasingly scarce labor, fertilizers,

pesticides, and particularly fungicides needed for the control of the coffee Leaf Rust and Coffee Berry Disease (Colletotrichum Coffeanum), which has been known in recent years to cause as much as 50 per cent loss of corp. Both the diseases are widespread in Kenya. There is a continuing sense of insecurity and political uncertainty as to the future of the country's largely foreign owned estate sector, which accounts for about 27,000 hectares out of the total coffee area of about 80,000 hectares in 1974. There is room for modest increases in both acreage and yields in the smallholder sector, probably 10 to 15 per cent, but estate production is expected to remain unchanged.

Burundi's and Rwanda's[59] coffee is grouped together with Central America's Other Mild Arabicas. During the mid-1960's both countries promulgated plans to increase production -- Burundi from about 200,000 bags to about 665,000 bags and Rwanda from about 175,000 bags to about 450,000 bags by 1972. However, these goals apparently proved too ambitious since the expected exportable production in both countries during the 1978/79 coffee year remains just over 300,000 bags. As for the future, while the Rwandans are still dedicated to increased coffee production, the Burundi government is coupling its coffee expansion drive with efforts to diversify into other commodities including rice, tea and cotton.

Tanzania's production has not changed much since the mid-1960's. Presently the government and the country's coffee authorities are engaged in foreign-assisted expansion and improvement programs with the object of just about doubling production by the early 1980's at

a total cost of about $25 million. We will discuss Tanzania's production potentials and policy options in a later chapter. In the meantime, we turn our attention to trends and prospects of weather conditions and their implications for world coffee supply.

Changing Long-Term Weather Patterns

The devastating food problems of the first half of the present decade which resulted from unusual weather conditions have caused the world outside the major centers of climatic studies to pay greater attention to studies indicating some major shifts in weather patterns all over the world. Long-term studies have shown that the earth's annual average temperature has fallen about 0.3°C since the 1940's.[60] The apparent smallness in this statistic may easily be misleading.[61] Experts in the field of climatology point out that what really matters is not so much the absolute change in temperature, but the resulting difference between the polar and tropical regions' temperatures.[62] Temperature changes, small as they may appear to be, mean greater variability in climate -- "extremes of cold and hot, wet and dry weather become more likely."[63]

Most of the documented climatic studies thus far have centered on the northern hemisphere; relatively less is known about the causes and trends of weather changes in the southern hemisphere. Bryson et al, however, notes that the Antarctica is known to have undergone extremes of winter cold and summer heat.[64] On the average, however, the southern hemisphere has in recent years tended to warm up. This

is thought to be mainly due to declining volcanic activity in this hemisphere, and the so-called "greenhouse effect" resulting from an accumulation of carbon dioxide in the atmosphere.[65] According to Lamb, declining volcanic activity results in a reduced volcanic dust barrier between the earth's surface and the sun, thus allowing more of the sun's energy to reach the earth's surface.[66] The accumulation of carbon dioxide in the atmosphere results from the burning of fossil fuels, among other things. While this build-up is incapable of preventing the sun's energy from reaching the earth's surface, it acts as a barrier to the energy being reflected back into space.[67] Therefore more of the sun's energy reaches the earth than is reflected back into space, leading to a general heat build-up and warming-up of the lower altitude, resulting in expansion of tropical winds.[68]

There is also considerable agreement amongst climatologists on the fact that changes in polar temperatures influence the location, equator-to-pole, of tropical winds. The narrowing of equator-to-pole temperature difference, resulting, for example, from warming up of the polar region, causes tropical winds to contract poleward and vice versa when this temperature difference widens.[69] The warming trend in the southern hemisphere, to which we have referred above, results in the narrowing down of temperature differences between the Antarctica and the tropics, leading to tropical winds, including the Westerlies and Monsoons, withdrawing further towards the South Pole than is usual and thus resulting in anomalous tropical weather conditions.

Tropical winds bring rains to many tropical regions. The poleward

shift of these winds is therefore likely to lead to inadequate rainfall, even droughts in these areas. In a like manner, when these winds expand further towards the equator as a consequence of increasing equator-to-pole temperature differences, as would occur for example when the poles experience extremes of cold winters, they bring abnormal rains and even floods in regions closer to the equator. These wind shifts therefore increase the likelihood of droughts and floods in the tropical coffee growing regions of the world.

In relation to the world coffee economy, there have been, as we have noted before, an increased frequency, and severity of frosts in the coffee growing regions of Brazil in recent years (see text Table 12), and the recent frosts have tended to extend further towards the equator than previous ones. Frost conditions have been reported in Amazonia, for example. Weather experts have not yet developed a good explanation of this phenomenon, but Bryson thinks that this phenomenon is due to either or both of two reasons. First, as the tropical winds expand towards the equator, they tend to adopt a north-south looping movement, reaching close to the equator in some areas and deep into the polar areas in others, thus bringing very cold polar air into the tropical and even equatorial regions and taking warm air from these regions deep into the polar regions.[70] Referring to the northern hemisphere, for example, Bryson cites one day in January, 1977 when the temperature both in Florida and Northern Greenland was 44°F as a case of the results of such looping wind movements.[71]

Second, as the Westerlies are drawn deep towards the Antarctica, during an Antarctica warm spell in winter, for example, winds which

would usually be discontinued or forced to rise to high altitudes by the Andean mountain range, blow around the southern tip of these mountain ranges and even further south past the Antarctica. There they pick up some extremely cold air and blow it deep into the tropical and equatorial regions as they get deflected towards the equator, either as part of the looping movements or for some other unexplained reason. The deflected winds tend to adopt an anti-clockwise movement as they approach the equator, thus tending to blow the cold Antarctic air into the coffee growing regions on the eastern side of the South American sub-continent, Brazil in particular.

In summary, this discussion points to the fact that to the extent that the future mirrors the past, we may expect increased weather variability from one year to the next, with greater probability of more severe droughts, floods and frosts extending further towards the equator than has been experienced hitherto. These trends in weather conditions have some very serious implications on policy options open to coffee producing countries worldwide. These we will consider in our next chapter. For the time being we turn our attention to coffee consumption trends and prospects.

Trends in Demand for Coffee

We mentioned in an earlier chapter that the world consumption of coffee has not been increasing very much and that future prospects are even more bleak. As may be seen in text Table 24 and appendix Table 11, while the world demand for coffee, as approximated by the volume of exports, has been rising, the rate of the rise has been

declining over time.

TABLE 24

COFFEE EXPORTS BY ICA MEMBERS BY COFFEE TYPES TO ALL DESTINATIONS
(FIVE YEAR AVERAGES: 1956-60 to 1971-75)

	1956-60	1961-65	1966-70	1971-75
Colombia Mild Arabicas:				
Million bags	6.319	7.164	7.857	8.905
Percentage change	-	13.4	9.7	13.3
Other Mild Arabicas:				
Million bags	7.170	9.122	10.473	12.867
Percentage change	-	27.2	14.8	22.9
Unwashed Arabicas:				
Million bags	16.464	17.452	19.366	18.396
Percentage change	-	6.0	11.0	-5.0
Robustas:				
Million bags	5.776	10.719	14.258	16.160
Percentage change	-	85.6	33.0	13.3
Total Exports:				
Million bags	39.209	46.114	51.955	57.317
Percentage change	-	17.6	12.7	10.3

Source: Calculated from: Annuario Estatistico do Cafe (Rio de Janeiro: IBC, December 1977), Table 5.2.1.

It is interesting to note that the percentage changes among the various types of coffee vary substantially over time, indicating some reallocation of market shares between the various types of coffee. We should note, too, that with the exception of the Unwashed Arabicas, all types of coffee have experienced increasing demand over the period of time considered.

Focusing our attention more on the Colombia Mild Arabicas (hereafter Colombians) and Robustas, the coffee of immediate interest to

Tanzania, we note that the demand for the Colombians has on the whole increased steadily. There was a slight lull during 1966-70 but the tempo picked up again during 1971-75. As for Robustas, the growth in demand has consistently fallen throughout the period. In text Table 25 we summarize the import shares of these two types of coffee in the major market.

The US Market

We note in Table 25 that in the US market the Colombians have, during 1971-75, recovered some of the market share they lost during the earlier periods, while at the same time the percentage increase in the Robustas' market share has deteriorated consistently. The Robustas had achieved remarkable gains in the US market during the 1950's to mid-1960's for a number of reasons. First, they were a substantial bargain over the Arabicas. This was a major scoring point during the early and mid-1950's when coffee prices were at a record high. The average New York market spot price differential between Robustas and the Colombians during 1952/53 and 1961/62 was -21.28 US cents per pound (it was -35.77 US cents per pound in 1955/56).[72]

At the same time as this price-motivated change in demand for imports was occurring, soluble coffee which appeared in the market several years earlier was gaining greater acceptance amongst consumers. US consumption of soluble coffee more than doubled between 1953 and 1959 (see Appendix Table 13). Text Table 26 summarizes trends in US consumption of soluble coffee.

TABLE 25

IMPORT SHARES OF COLOMBIAN MILD ARABICAS AND ROBUSTAS IN THE MAJOR MARKET AREAS

	1959-60	1961-65	1966-70	1971-75
USA:				
Colombian Mild Arabicas:				
Share of Imports (%)	20.4	16.8	14.5	16.2
Change in share of Imports (%)	-	-17.5	-13.9	11.4
Robustas:				
Share of Imports (%)	7.7	19.4	26.0	26.5
Change in share of imports (%)	-	151.9	33.9	1.8
All other imports (%)	71.9	63.8	59.5	57.3
Northwestern Europe:				
Colombian Mild Arabicas:				
Share of Imports (%)	13.3	21.8	23.7	29.4
Change in share of imports (%)	-	64.2	8.5	24.0
Robustas:				
Share of Imports (%)	7.9	10.3	13.6	14.0
Change in share of imports (%)	-	29.5	32.4	2.8
All other imports (%)	78.8	67.9	62.7	56.6
Other Europe, Canada, Australia and Japan:				
Colombian Mild Arabicas:				
Share of Imports (%)	9.5	10.2	8.3	7.9
Change in share of imports (%)	-	7.8	-19.0	-4.3
Robustas:				
Share of Imports (%)	27.1	42.9	41.7	40.8
Change in share of imports (%)	-	58.5	-2.9	-2.3
All other imports (%)	63.4	46.9	50.0	51.3

Source: Calculated from: Anuario Estatistico do Cafe, (Rio de Janeiro: IBC, December 1977).

TABLE 26

US SOLUBLE COFFEE CONSUMPTION

Cups Per Person (10 years and older) Per Day

	Total All Coffee (Cups)	Soluble Coffee			
		All Soluble Coffee		Freeze Dried Coffee	
		(Cups)	(% all coffee)	(Cups)	(% all coffee)
1953-57	2.67	0.38	14.2	na	na
1958-62	2.93	0.60	20.5	na	na
1963-67	2.88	0.62	21.5	na	na
1968-72	2.56	0.67	26.2	0.14[a]	5.6
1973-76	2.22	0.69	31.1	0.27	12.2

Notes: na = not available
a = Four year average (1969-72) as no data available for 1968 and before.

Source: Calculated from Appendix Table 13.

The trend in soluble coffee consumption pushed up US demand for Robusta coffee for two reasons in addition to the price advantage already mentioned. First, the percolation and spray-drying process involved in the manufacture of soluble coffees (most of the soluble coffees produced in these earlier years were spray dried) "tends to take the edge from very good and very bad coffees",[73] and therefore, it is good economic sense for manufacturers to substitute the cheaper harsh-tasting Robusta for the highly priced mild-tasting Arabicas. Secondly, Robusta beans have a higher yield of soluble coffee than Arabicas -- one pound of Robusta beans yields about half a pound of soluble coffee while a pound of Arabica beans yields only

about one-third pound of soluble coffee.[74] Furthermore, the physical quality of Robusta coffee marketed at this time, was much improved over that of similar coffees marketed earlier -- Cordell notes that, "many trade sources are of the opinion that in this respect they (Robustas) are now equal to the Latin American coffees,"[75] mostly Arabicas.

Many coffee roasters therefore continually increased the proportion of Robustas in their blends, thus continually bidding up the price of Robustas, resulting in a continued closing of the price gap between them and the Arabicas over time through 1968-72, receding somewhat in the period 1973-75. Text Table 27 attests to this process.

TABLE 27

PRICE DIFFERENTIALS BETWEEN ROBUSTA AND ARABICA COFFEES

Basis Colombian Mild Arabicas

	1953-57	1958-62	1963-67	1968-72	1973-75
Colombia Mild Arabicas (cts per lb)	68.50	46.23	45.10	49.03	74.96
Other Mild Arabicas (cts per lb)	-3.10	-3.73	-3.34	-4.28	-12.76
Unwashed Arabicas (cts per lb)	-6.75	-6.75	-4.44	-4.30	-6.75
Robustas (cts per lb)	-23.36	-19.18	-13.10	-10.36	-21.17

Source: Annual Coffee Statistics, 1975, (New York: PACB, 1976), p. A104.

This narrowing of the price gap between Robustas and Arabicas is likely to have contributed to the lull in demand for the Robustas during the later years, as is evident in Appendix Table 12 and implied in text Table 27 by the widening of the price spread during 1973-75. Also, as the proportion of the harsher Robustas increased in the coffee blends, particularly those of the regular (ground) coffees, the overall taste deteriorated, contributing to an overall erosion of consumption in this market. Lawrence et al. have found a statistically significant negative relationship between US regular coffee consumption (generally over 70 per cent of all coffee consumed in the US is in the regular form) and the proportion of Robustas in US coffee imports between 1946 and 1976.[76] The industry responded to consumers' apparent concern over loss of taste in soluble coffee by introducing freeze-dried instant coffee. The freeze-drying process locks in most of the taste and aroma present in the raw material (coffee beans), so that the final product retains these properties to nearly the same extent as in regular coffee. Freeze dried soluble coffee therefore combines the convenience of instant coffee (quick to prepare) with the taste and aroma of regular coffee. However, so as to raise the aroma and taste in this newer form of soluble coffee, the proportion of the milder coffees, Arabicas, had to be increased in the blends, thus probably contributing to the further decline in the demand for Robustas during recent years.

As is evident in Appendix Table 13, the consumption of freeze-dried coffee increased from 0.11 cup per person in 1969 to 0.30 cup per person in 1974 but then suffered a substantial reversal in 1975 and

1976, when the daily consumption fell to 0.29 and 0.25 cup per person respectively. No clear explanation is available for this later turn of events, but one possible explanation is that the increased price differential between the Robustas and the Arabicas in recent years (see text Table 27) translated into increased retail price differential between the high Arabica containing freeze-dried and the high Robusta spray-dried instant coffees, thus causing some consumers of US freeze-dried to switch to the spray-dried form. The probability of the occurence of this shift is vindicated in part by the findings of Pan American Coffee Bureau's winter 1976 survey of coffee drinking in the United States. The survey revealed that spray dried instant coffee stabilized its previously declining trend during this same period of time[77] as freeze-dried coffee was losing ground.

The Northwestern European Market

In this market we include the Scandinavian countries -- Sweden, Norway, Denmark and Finland, as well as West Germany and Holland. This is a high quality conscious market as is demonstrated by the high proportion of Arabicas in their total coffee imports in text Table 28.

This market includes the world's second largest importer since 1961, West Germany. It also includes Sweden, the world's leading per capita consuming nation, averaging 31.0 pounds per head in 1975. On the whole imports have been rising, although Norway and Denmark appear to have reached their peak in about 1970, they continue to hold steady. For the whole market, imports rose 41.2 per cent during

1961-65, 23.7 per cent during 1966-70 and 10.3 per cent during 1971-75 (calculated from Appendix Table 14).

TABLE 28

NORTHWESTERN EUROPE'S IMPORTS OF ARABICA COFFEES FROM ICA MEMBERS AS A PERCENTAGE OF THEIR COFFEE IMPORTS

	1970	1971	1972	1973	1974	1975
Denmark	83.6	80.6	85.4	80.6	84.0	79.5
Finland	86.4	97.0	97.4	97.3	93.8	97.3
Holland	62.4	68.6	73.1	74.6	62.4	69.6
Norway	92.2	94.3	96.0	96.0	92.6	95.2
Sweden	92.7	94.3	95.0	95.1	93.5	96.0
West Germany	83.5	84.8	84.5	84.1	82.4	86.4

Source: Calculated from: Anuario Estatistico do Cafe, (Rio de Janeiro: Instituto Brasileiro do Cafe, December 1977), Tables 6.8, 6.10, 6.12, 6.17 and 6.18.

As is shown in text Table 25, the share of the Colombians in this market has been growing all the time. During 1966-70 the rate of growth in these coffees' share of the market deteriorated rather severely but it recovered considerably during 1971-75. The share of the Robustas, on the other hand, although not declining, is just barely growing, increasing a mere 2.8 per cent in 1971-75.

Consumers in most of the Northwestern European countries are famed for their clearly defined habits and fussiness about aroma in their traditionally brewed cup of coffee. A United Nations' study notes, for example, that the Swedes "are very fussy about quality, and the

preparation of coffee often amounts to a veritable ceremony."[78] In the Federal Republic of Germany (FRG), the bulk of coffee is still sold at the retail level in the form of full-roasted beans for home grinding.[79] Although the per capita consumption of coffee in the FRG was only 11.9 pounds in 1975, as compared to Sweden's 31.0 pounds, for example, it is believed that the FRG market has a relatively brighter future than that of the Scandinavian countries.[80] One of the contributing factors to this promising future is the fact that, partly as a result of the strong German currency relative to the US dollar, in whose denomination coffee is usually paid for, the price of coffee in the FRG was in 1974 generally lower than it was in 1962, and in some cases even lower than it was in 1959.[81] The continued strength of the Deutschmark therefore offers a measure of a guaranteed future for coffee in the German market.

While we are short of up-to-date data on the consumption of soluble coffee in this market, it may be safe to say that this form of coffee has not, at least in the early years, been received with great enthusiasm. This might have been expected, considering the conservative nature of the market noted earlier. De Vries notes that generally the consumption of soluble coffees tends to be higher in areas where coffee has recently attained popular acceptance.[82] He notes that soluble coffee consumption was only about 10 per cent of total coffee consumption in Scandinavia in 1975, which implies a modest change from this region's consumption rates during the late 1960's. In 1968 solubles accounted for 5 per cent of total coffee

consumption in Denmark,[83] 2 per cent in Sweden,[84] 2 to 2.5 per cent in Norway[85] and about 1 per cent in Finland.[86] In the FRG, solubles accounted for about 18-20 per cent of total coffee consumption in 1974[87] indicating a minimal change from the country's level of soluble coffee consumption in 1968 of 15 per cent.[88] About 35 per cent of all soluble coffee consumed in FRG is freeze-dried, a marked increase from 15 per cent in 1968. As one might have expected, considering the quality consciousness of the market, freeze-dried soluble coffee also forms a sizeable and growing proportion of the solubles share of the market in the other countries in this market. In 1968 freeze-dried coffee accounted for about 10 per cent of soluble coffee consumption in Denmark and 25 per cent in Holland. Holland consumers have been marked for their adamant preference for regular coffee, so that the future for soluble coffee in this country is gloomy.[87]

Other Major Markets: Europe, Canada, Australia and Japan

The countries tabulated in Appendix Table 15, France, Italy, Belgium and Luxemburg, Britain, Switzerland, Austria, Canada, Australia, and Japan are diverse both in characteristics of coffee consumption and in geographical dispersion. However, probably with the lone exception of Austria, a relatively minor coffee importing member of the group, all these countries import more Robustas than Colombians. Some individual country markets are fairly young -- Japan, Britain, Australia and Austria are cases in point, while others are veterans;

some, Japan in particular, are burgeoning while others are struggling just to remain steady. On the whole, however, the group exhibits a very steady and increasing growth of imports -- imports grew by about 25.4 per cent during 1961-65, 22.8 per cent during 1966-70 and 23.5 per cent during 1971-75.

As is indicated in text Table 25, both Colombians and Robustas have lost considerable ground in this market since the early 1960's. A better appreciation of the situation may be achieved by taking a closer look at the individual country markets. Starting with France, the world's third largest importer of coffee, we note that the French total imports have been on the rise almost consistently since the 1950's. At the same time, however, we are told that France's imports from her traditional sources, Francophone Africa, declined from about 75 per cent of the country's imports during the early 1960's to about 60 per cent in recent years.[90] Since most of Francophone African coffees are Robustas, and since the French market accounts for about a quarter of the group market, this decline in the African Robustas' share of the French market contributed significantly to this general deterioration in Robustas' performance in the overall group market.

Furthermore, in recent years France has been importing and exporting appreciable volumes of instant coffee from high Arabica consuming and producing countries including Brazil, Colombia, West Germany and the Netherlands. For France to be able to manufacture soluble coffees that meet the consumer demands of the FRG, Holland and Venezuela, to which countries she exports appreciable volumes of her soluble coffee

production, she must import larger volumes of Arabica coffees. Similarly, the large volumes of soluble coffees she imports from Brazil, Colombia, the FRG and the Netherlands are likely to have a high Arabica content. As for France's own consumption, UNCTAD/GATT estimates that about 73 per cent of the increase in soluble coffee consumption during 1967/68 went to freeze-dried instant coffee, and at that time soluble coffee consumption accounted for about 16 per cent of the country's total coffee intake.[91] In 1975 freeze-dried soluble coffee accounted for about 25 per cent of France's total consumption of soluble coffee, whose own share of total coffee consumption was increasing at between 7 and 8 per cent per annum.[92] Needless to say, these statistics speak well for Arabicas' future in the French market.

Italy is the fourth largest importer of coffee in the world. The country's imports have been steadily rising throughout the period covered in Appendix Table 14. The market is predominantly Arabica but the Colombians form a very small proportion of Italy's Arabica imports. The Robustas' standing in this market has improved considerably over the years, but they still account for a smaller share of the market than the Arabicas. The Italian market is traditional and largely uneventful. In the past Italians bought their coffee green at the retail level and did their own roasting and grinding at home. This practice is now fading away and families buy their coffee roasted and even ground.[93] Cavalleri notes that Italians, more and more of whom are drinking their coffee away from home, like their coffee prepared by the expresso method (entailing blowing of steam through ground coffee) rather than

instant coffee, a factor which contributes to the relatively low consumption of soluble coffee in the country -- estimated at 4 to 5 per cent of total coffee consumption in 1977.[94]

The Swiss market appears to have reached the saturation point --their total imports have levelled off since the early 1970's. Some reallocation of market shares between the various types of coffee seems to be taking place in favor of the Robustas, whose share is increasing even though the overall volume of imports is stagnating. The Colombians, on the other hand, are experiencing an absolute deterioration in their market share. The increasing proportion of Robustas appears to be destined for the country's rather large soluble coffee production capacity, probably more for the export market than for domestic consumption. In 1975 Switzerland exported 380,943 bags green coffee equivalent of soluble coffee.

Austria, like Switzerland, is an Arabica market, drawing the bulk of its supplies from the Other Milds and Unwashed Arabicas and only a small amount from the Colombians. The market's demand for Robustas is very limited and has remained virtually stagnant since the mid 1960's, probably because this country has no soluble coffee production capacity (as of 1968). In 1968 soluble coffee consumption accounted for about 6 per cent of total coffee consumption. Of this, about a third was freeze-dried. No up-to-date data is available on soluble coffee consumption in this market.

The Belgium and Luxemburg market appears to have reached its saturation point very early during the period covered in Appendix Table

14. The total imports reached the 1 million bag mark in 1956 but did not reach 1.2 million until 1973. After this, imports rose to about 1.4 million bags in 1975 and 1976. It is unlikely that the 1975 and 1976 import levels signal a continuing trend in consumption. A 1972 ICO-sponsored study of Belgian consumer attitudes revealed that coffee is deeply entrenched amongst older people and women, who spend more time at home. Given the choice, youths were found to prefer other drinks.[95] This trend spells an uncertain future since if the youth retain their low prefernce for coffee into adulthood, total consumption could decline. On the other hand, the youthful attitude towards coffee may be just that, and when adulthood comes along preferences will shift to coffee. Soluble coffee consumption in this market is very low and grows only sluggishly -- it was 1 per cent of total consumption in 1959, 5 per cent in 1962 and 1968 and between 7 and 10 per cent in 1975. In 1968 a fifth of all soluble coffee consumed was freeze-dried, and although we do not have recent data, the percentage is likely to have increased considering the trend in neighboring country markets.

The British market may be said to be slightly old in age but very young in spirit. The British have known coffee for a long time; their nationals have produced and traded in coffee for years, and London is a major coffee market, yet coffee has only just caught on in Britain. Tea remains the British national drink but coffee is gaining fast at the expense of tea, whose consumption in Britain declined 0.7 per cent per annum during 1955-57 to 1971-73.[96] Coffee consumption, on the other hand, has increased steadily over the past

two decades, as is shown in text Table 29. During the most recent years, however, we note that there is a considerable lull in consumption. It is not clear whether this indicates that a saturation point has been reached or whether we are merely observing a temporary drop in the overall upward trend.

TABLE 29

COFFEE CONSUMPTION IN BRITAIN

(Pounds of Green Coffee Equivalent Per Person Per Year)

Years	Pounds	Years	Pounds
1953	1.30	1971	4.70
1956-60	1.75	1972	4.4
1961-65	2.78	1973	5.9
1966-70	3.66	1974	4.5
1971-75	4.78	1975	4.4

Source: PACB, Annual Coffee Statistics 1975, (New York: PACB, 1976), Table C-12, p. A-93.

The other conspicuous aspect of the British coffee consumption pattern is the fact that over 90 per cent of coffee consumed in this country is in the instant form.[97] Instant coffee which was introduced in Britain in 1939;[98] gained popularity mainly during the last two decades. In 1955 soluble coffee accounted for between 25 and 30 per cent of all coffee consumed in Britain, in 1969 it was 60 per cent, and by 1968 it reached 80 per cent.[99]

As is clear in Appendix Table 14, Britain's imports of Robustas are by far greater than those of the Colombians, particularly after the

1960's. This preference for Robustas is seemingly related to her heavy consumption of instant coffees, mostly of the spray-dried form. For price and technical reasons that we have already discussed, Robusta coffees lend themselves best to spray-dried instant coffee production.

The Australian market appears to be growing. It is rather heavily Robusta oriented with the Colombians apparently not making any headway whatsoever. Information on the market is limited but from Appendix Table 14, it appears that the Robustas will continue to prosper in this market.

Trends in the Canadian coffee market have much in common with those in the United States — only on a smaller scale. As may be seen in Appendix Table 14, the market appears to have reached saturation during the late 1960's, after which time imports have tended to fluctuate within a farily narrow range. A similar trend is observable with respect to consumption per capita, as is evident in text Table 30.

TABLE 30

COFFEE CONSUMPTION IN CANADA: 1970-75

(In Pounds of Green Coffee Equivalent)

Year	Pounds per person
1970	9.4
1971	9.0
1972	9.0
1973	9.0
1974	9.5
1975	9.3

Source: PACB, Annual Coffee Statistics, 1975, (New York: PACB, 1976), Table C-6, p. A-89.

As has been the case with the United States, the Canadian market took a greater proportion of the Colombians than the Robustas during the earlier years, but this reversed after the 1960's following which period the Robustas gained preference until the beginning of the 1970's, when their trend turned downwards. In the meantime, the Colombians made a slight recovery, at least until 1975.

Again in common with the United States, coffee is regarded in Canada as an adults' drink, with heaviest drinkers falling within the 30-50 years age bracket. While the overall consumption per capita is stagnant, there is some shift in market shares between soluble and regular coffees, although the regulars still command the lead.

Japan is traditionally a tea (green tea) drinking nation. This situation is, however, changing rather rapidly, as text Table 31 indicates.

TABLE 31

MARKET SHARES FOR TEA AND COFFEE IN JAPAN

Year	Green Tea (%)	Black Tea (%)	Coffee (%)
1969	71.4	4.0	24.6
1977	54.0	3.9	42.1

Source: Ken Nemoto, "Consumption Back in the Rise," Tea and Coffee Trade Journal, June 1978, p. 18.

Tomizawa, a Japanese business executive, attributes the growth in Japanese coffee drinking to the trend towards westernization of the Japanese diet, a trend which received its greatest boost from

Japan's adoption of the American style school lunch program.[100] In the program meats, bread and dairly products replace the traditional rice and fish. Once the traditional diet was superseded by the American style diet, the incorporation of coffee was only natural to complete the American style menu. Consequently, the nucleus of coffee drinking in Japan has been the younger generation. This generation drinks more instant than regular coffee. In 1969 it was estimated that about 70 per cent of instant coffee drinkers in Japan were in the 20-30 years age bracket.[101] The tendency therefore has been for soluble coffee consumption to grow faster than regular coffee. One observer estimates that between 1965 and 1977, soluble coffee sales in Japan increased by 60 per cent as compared to 40 per cent increase for regular coffee.[102]

Probably due to the relative preponderance of the soluble over regular coffee in this market, Japan imports more Robustas than Colombians. There is nothing to suggest a change in this situation, given the weak position of regular coffee and the fact that freeze-dried coffee does not, as of 1970, appear to be making much headway. UNCTAD/GATT report that freeze-dried coffee was introduced in Japan in 1967 but up to 1970, it only accounted for 10 per cent of soluble coffee consumption.[103]

The Socialist countries of Eastern Europe and Asia have a tremendous coffee consumption potential, but the strict monetary, trade and fiscal controls prevalant in these countries render the markets largely inaccessible via the regular market channels. Data on these

markets is therefore very limited. However, even if data were available, any analysis based on past trends in these markets is not likely to be of much use in predicting future market conditions, since these conditions are very much subject to exogenous policy decisions rather than determined independently on the basis of the supply and demand position.

As we indicated previously, coffee consumption in many producing countries is also a function of public policy decisions -- when world market prices are high, domestic consumption is shrunk to make room for increased exports and earnings thereof. Consumption in other countries, particularly the LDCs, is checked by these countries' low levels of income so that prospects for increased coffee consumption are tied in with progress on the income front. Since incomes do not appear to be increasing much, coffee consumption will continue to remain low.

Summary and Conclusion

We have seen in this chapter that the 1962 and 1968 ICAs entailed price and exports controls that were too rigid and as such proved incapable or too cumbersome in making the requisite adjustments to cope with changing circumstances. They were too rigidly tailored to fit a prevailing set of circumstances. At the same time the agreements were weak in enforcement mechanisms, providing many loopholes for enterprising members and traders to by-pass the regulations, an eventuality which greatly frustrated the less experienced parties.

The 1976 ICA shows greater foresight and a wide range of inbuilt flexibility mechanisms. These include an automatic quota trigger and suspension mechanism, a quota allocation system that is based on each member's choice of historical or more recent export performance and current verified level of stocks, as well as a linkage of the price objectives with inflation and international monetary and economic trends. The agreement, while not imposing production controls on the members, provides for a stricter penalty on members who overship their quotas. It also has an incentive provision for exporting members to make timely declarations of export quota shortfalls for redistribution, thus providing relief for other members who may have surplus stocks, and enabling the declaring member to reclaim some of the declared shortfall during a future period. These flexibility provisions, among other things, make it possible for low cost producing countries to enlarge their market shares, while at the same time making it more difficult for uncrupulous members to manipulate the market to the disadvantage of others.

We have also seen that Brazil's coffee exports are declining, both in absolute terms and relative to the world's total. The factors behind Brazil's loss of market share include increased frequency of devastating frosts and the ever-increasing costs of recovery from these and other devastations; increasing costs of fertilizers, pesticides and fungicides needed for maintaining yields; and increasing labor costs. Probably the most important factor that has and will continue to hurt Brazil's coffee industry is the very process of economic development

and the successful economic diversification programs that have come with it. Investors, including coffee producers, find an ever-increasing range of investment alternatives, agricultural and/or industrial, that are more rewarding and less risky than coffee production. Labor is becoming increasingly scarce and expensive while at the same time total mechanization in coffee is not yet feasible. Even more important, probably is the fact that given the present state of the Brazilian economy, it is doubtful if the government, which has in the past acted as the industry's "godfather" in times of dire desperation, will find itself sufficiently desperate as to come all out in support of this dying industry when there are now many more rewarding venues for investing public funds.

These Brazilian coffee industry problems and trends are compounded by the prospects of a more unpredictable weather regime that we have discussed. The future promises increased frequency, severity and expanse of frosts in the country, as well as increased droughts and floods, both in Brazil and other coffee producing areas of the world. This spells out greater instability in the world's coffee economy and with it, greater economic strain and temptation for the Brazilian coffee farmer to leave coffee production. In short, Brazil is not likely to be able to recover much of her lost "traditional" share of world trade in coffee; instead, that share is likely to suffer continued erosion and more and more of it will continue to be "up for grabs" by other producing nations. Tanzania stands a good chance to gain an appreciable share of these spoils if satisfactory policies can be

formulated and implemented in good time and judiciously.

We have seen that production and exports from the other Latin American coffee exporting countries are, on the whole, holding steady. Many of these countries have ongoing programs aimed at increasing their coffee exports through the use of technology-intensive techniques, including the heavy application of fertilizers, strict disease and pest control regimes, and the planting of high yielding varieties, which in some cases allow for increased plant density. We have cited some problems that these programs will have to overcome to be successful. These range from political uneasiness to high costs of labor and technology. In this respect it might be opportune to recite Rourk's "all or nothing" warning concerning the use of technology in coffee production:

> Modern techniques, unfortunately, are generally accompanied by increased inputs and higher costs. Many experts consider that for coffee cultivation to be a paying proposition, it must be carried on either completely traditional lines, with a minimum of inputs of capital, primitive techniques, and consequent low yields or, on the basis of the most modern technology, requiring a large capital investment and expert management, but giving very high yields of 1,000 kilograms per hectare or more. The intermediate stage between the two, in terms of inputs and yields, represents a serious challenge and often results in financial loss.[104]

We should point out, too, that in spite of this rather scary warning, it is not impossible to get the results aspired to -- Costa Rica already produces 1260 kilograms per hectare. The other countries in the region have some distance to catch up -- El Salvador averages 1,000 kilograms per hectare, while Honduras and Panama average 250, so the task of catching up in yields with Costa Rica should not

be underestimated either.

Africa's exportable coffee production, we have seen, is on the rise, and so is its share of the world's total. Given the recent developments in the world coffee market, many countries are likely to have plans to expand production. Expansion of production may take place on estates or at the smallholder scale. Where expansion is to take place on estates, and labor is scarce, and as we have seen labor is scarce in many African producing countries, Rourk's "all or nothing" warning becomes particularly relevant. The problem of obtaining adequate supplies of labor becomes compounded by the high production input and equipment costs, and probably most of all by the difficulties of obtaining the necessary financing. However, in countries where labor is relatively plentiful and relatively cheap, and labor tends to be cheaper in much of Africa than in much of Latin America, production expansion could be carried out economically at the plantation scale without too heavy an investment in technology.

Production expansion on the smallholder scale -- the minimum technology approach, appears to have a better chance of success. This approach, however, is likely to have a longer gestation period, due mainly to organizational problems. Smallholder producers will be scattered over a large area, and they will usually need to be persuaded to implement such a program, as well as assisted in obtaining the necessary production requirements. In spite of these potential bottlenecks, given Africa's present circumstances, this appears to be the more practical option -- at least it appears so for Tanzania. It is therefore likely that Africa's production will not be too

too different from its historical trends for some time still.

We have noted that while the world's demand for coffee is still increasing, the rate of increase is slowly grinding to a halt as consumption approaches saturation levels in more and more countries. Experience, however, differs between markets, coffee types and forms of coffee consumed.

In the United States, consumption is declining in absolute terms but there is considerable reallocation of market shares between the Arabicas and Robustas. The latter, which made considerable gains during the 1950's and 1960's because it had price and technical advantages in the processing of soluble coffee, seems now to be giving way, in part due to the closing of the price gap between the two generic types of coffee, and the increasing demand for more aromatic coffees needed in the production of freeze-dried soluble coffee, whose consumption is growing.

The demand for coffee in Northwestern Europe is increasing. The predominance of Arabicas in this market is of particular interest to Tanzania since her coffee exports are over 75 per cent Arabicas. Also of interest is the fact that this market has remained loyal to regular coffee since, as we have explained, the process of soluble coffee production tends to compromise the good quality of Arabicas with the harsh taste of Robustas. This could lead to loss of market for the Arabicas as manufacturers become tempted to substitute the cheaper Robustas for the Arabicas.

However, there is another side to this issue. According to the

Pan American Coffee Bureau, as of 1975 it takes 2.5 pounds of green beans to produce a pound of soluble coffee[105] which in turn yields 50 per cent more cups per pound than does regular coffee.[106] Also, according to the PACB, 1.19 pounds of green coffee beans yield one pound of regular coffee,[107] meaning that, in terms of green coffee, one pound of soluble coffee equals 2.10 pounds of regular coffee. This in turn means that if consumers are going to drink a given number of cups a day, they will need more green beans to meet their consumption needs if they use soluble coffee than they would if they used regular coffee.[108] Yet another interesting trend with respect to soluble coffees in this market is the fact that where these forms have attained considerable acceptance, as in West Germany, the freeze-dried form commands a growing preference. As we have mentioned, this form of soluble coffee is more likely to embody more Arabicas, thus providing a further guarantee of the prospects of the Arabicas in this market. It therefore appears that on the whole, instant coffee or otherwise, this market is and will remain sold on the Mild Arabicas.

In the other markets, experience varies widely between countries but with only a few exceptions, demand continues to rise. In some of the markets, whereas overall demand is slackening, soluble coffees are making some progress, thus, as we have explained, helping to mitigate absolute decline in green coffee intake in such markets. In some of the more progressive markets such as Britain and Japan, soluble coffee occupies a very prominent place, thus tending to accelerate green coffee intake even further.

In summary, the discussion in this chapter has pointed out that there is room in the world coffee market for Tanzania to enhance her gains from coffee trade by increasing her market share. The production trends indicate that Tanzania, using appropriate organization and technological levels, has a considerable competitive edge over the high cost producers, in Latin America particularly. We have seen that the probability of a future prolonged glut in the market is low, given the likely increase in weather instability. Consumption trends are encouraging, particularly if production continues to shift in favor of the lower cost producing areas, thus keeping consumers' prices more reasonable in the long-run.

In our next chapter, we develop policy recommendations that are likely to help Tanzania utilize these market prospects and opportunities to enhance her gains from trade in coffee.

FOOTNOTES

1. T. M. Loudon, "UN International Coffee Conference", (Report to the Secretary General, East African Common Services Organization, Nairobi, Kenya). September 5, 1962, p. 7.

2. Author's interview with T. M. Loudon, London: July 26, 1978.

3. T. M. Loudon in a letter to the Chairman, Tanganyika Coffee Board, Moshi, Tanzania. August 25, 1965, p. 2. Mr. Loudon, now the Deputy Executive Director of the ICO, was East Africa's principle negotiator during the Coffee Study Group and advisor to the East African delegations at the UN International Coffee Conference.

4. Mainly waivers, defined as relief of an obligation under the agreement, (usually in the form of extra-quota export authorization) granted a member by the Council on account of exceptional or emergency circumstances to relieve such a member from serious hardships or inequitable burden under the agreement. (Article 60, ICA 1962).

5. Singh, ICA-1968, p. 12.

6. Ministry of Agriculture, "Brief for Tanzania Delegation to the Second ICC Session in London, November 18-23, 1963." (Dar-es-Salaam: Ministry of Agriculture, November 6, 1963).

7. Singh, ICA-1968, p. 22.

8. To assess Tanzania's gain in export quota size between the 1962 and 1968 ICAs, we need to express the respective quotas in terms of a common base. Taking the 1968 ICA's basic global quota, 55,041,000 bags, as the common base, we calculate the country's 1962 ICA basic quota to be about 521,000 bags = 435,548 x 55,041/46,050,000. The divisor, 46,050,000, was the global basic quota for the 1962 ICA.

9. Singh, ICA-1968, p. 14.

10. Bart S. Fisher, The International Coffee Agreement: A Study in Coffee Diplomacy, (New York: Praeger Publishers, 1972), p. 65.

11. Law, op. cit., p. 101.

12. Streeten and Elson, op. cit., pp. 30-32.

13. International Coffee Conference, Conference Room Paper #C.3/12 and C.3/12/Add. 1 of July 30, 1962.

14. T. M. Loudon's letter forwarding the report on the UN Inter-National Coffee Conference (footnote 1), September 5, 1962, p. 2.

15. T. M. Loudon, Report of a meeting between Mr. Loudon, and the Commercial Attache at the British Embassy in Washington, D.C. with Mr. W. M. Blumenthal and P. Callanan of the US State Department, Washington, D.C., July 11, 1961.

16. Report by a British representative to a meeting between Mr. W. M. Blumenthal, then US Deputy Assistant Secretary of State and Mr. T. Munn, Chairman designate of the Coffee Study Group, presented to a Colonial Office meeting between representatives of the East African governments and coffee industries with British government representatives, called to discuss the Coffee Study Group the ICA (short-term) meeting scheduled later that year. London, June 8-13, 1961. (CAT files).

17. Author's interview with Joel L. Johnson of the Senate Foreign Relations Committee, (Washington, D.C.: Senate Foreign Relations Commitee Offices, December 13, 1977). Mr. Johnson, then with the US Department of Commerce, was a member of the 1976 ICA US negotiating team.

18. International Coffee Agreement 1976, (London: ICO, January, 1976), Article 38, p. 36.

19. John Woodland, "Coffee: London Talks Face Blend of Troubles", The Times (London), September 16, 1974, p. 12.

20. Gerald L. Sparsky, Assistant Secretary of the Treasury for International Affairs, Statement to the U.S. Senate Foreign Relations Committee, Washington, D.C., July 27, 1976, p. 9.

21. Ibid., p. 8.

22. Statement by the Head of the Brazilian Delegation at the Opening of the Twenty Eighth Session of the Council, ICO document ICC 28-3 (E), (London: ICO, November 3, 1975), p. 3.

23. Geer, op. cit., p. 113.

24. Jackson Wallace, "Effect of Frost on Brazilian Coffee a Matter of Guesswork". The Times (London), August 21, 1978, p. 16.

25. George E. Schuh, "The Modernization of Brazilian Agriculture", mimeo, prepared for the US National Academy of Science, June 1973, p. 5.

26. Edmund Missiaen and Samuel O. Ruff, Agricultural Development in Brazil: A Case Study of Sao Paulo, USDA Foreign Agriculture Economic Report #109, (Washington, D.C.: USDA, FAS, June 1975), p. 4.

27. Maidenberg, op. cit.

28. Michael Frenchman, "Coffee: The Search for the Super Bean," The Times (london). June 8, 1977, p. 18.

29. Missiaen and Ruff, op. cit., p. 4.

30. The Comptroller General of the United States, Coffee: Production and Marketing Systems, Report to the Congress (Washington, D.C.: US General Accounting Office, October 28, 1977), p. 67.

31. Ibid.

32. Woodland, op. cit.

33. On these bases the total cost of producing a 60 kilo bag of clean coffee in Brazil, considering both labor and non-labor costs is 9 x 5.54 x 2 = $99.72.

34. Jos de Vries, "The World Coffee Market", op. cit., Singh, et al., Table 2, pp. 28-29.

35. The US Comptroller General, op. cit., pp. 25-26.

36. Ibid., p. 22.

37. de Vries, World Coffee Market, Table 2, pp. 28-29.

38. The US Comptroller General, op. cit., p. 88.

39. "Coffee Expansion Schemes Could Boost Output by 1980", Tea and Coffee Trade Journal, June 1978, pp. 20-21.

40. Ibid., p. 21.

41. The US Comptroller General, op. cit., p. 75.

42. "Coffee Expansion Schemes", op. cit., p. 21.

43. "Fear That the Coffee Rust Will Spread", The Times (London), June 28, 1977, p. 24.

44. The US Comptroller General, op. cit., p. 76.

45. Woodland, op. cit.

46. There are two main methods of primary processing coffee before it is marketed as green (clean coffee) -- the wet and dry methods.

Under the wet processing, the ripe fruits (cherries), after they are harvested are pulped with bare hands, small hand operated pulperies or mechanical pulperies to expel the beans. These are then fermented to loosen the mucilage layer that surrounds the beans. When fermentation is complete, the beans are washed with water and when all the mucilage is removed they are dried on mesh wire trays resulting in parchment coffee. Finally parchment coffee is hulled and cured into green (clean) coffee. Arabica coffee thus processed, and usually only Arabica coffees proves economical to wet-process, is referred to as mild coffees. In the dry process, the cherries after harvesting are sun dried on mats or on the ground. When they are sufficiently dry, they are hulled and cured into green coffee. The resulting product, be it Arabica or Robusta, is referred to as hard coffee.

47. Ibid., The US Comptroller General, p. 83.

48. J. Phillip Rourk, Coffee Production in Africa, USDA, FAS M-266, (Washington, D.C.: USDA, Foreign Agricultural Service, September 1975), p. 7.

49. Ibid., p. 8.

50. New York spot prices (¢/lb) for cocoa (Accra, Ghana) and Robusta coffee (Ambriz 2AA):

Year	Coffee	Cocoa
1970	42.0	34.2
1971	42.8	26.8
1972	44.9	32.3
1973	50.0	64.7
1974	59.1	98.2
1975	58.0	74.6
1976	96.2	109.6

Source: Commodity Trade and Price Trends, (1977 edition), (Washington, D.C.: IBRD, August 1977), pp. 30 and 32.

51. Foreign Agriculture Circular: Coffee, USDA FCOF 4-78, (Washington, D.C.: USDA Fo-eign Agricultural Service, October 1978), p. 4.

52. The US Comptroller General, op. cit., p. 81.

53. Rourk, op. cit., p. 13.

54. Ibid., p. 12.

55. Ibid., p. 16.

56. Ibid., p. 17.

57. Ibid., pp. 3-6.

58. Ibid., pp. 17-19.

59. Ibid., pp. 21-22.

60. "Statement of the International Federation of Institutes of Advanced Study (IFIAS) Workshop on the Impact of Climate Change in the Quality and Character of Human Life", Bonn, Federal Republic of German, May 10, 1974; reproduced in Reid A. Bryson, John E. Ross, Robert W. Hougas, and Lincoln E. Engelbert, Climatic Change and Agricultural Response: A Statement on Research and Technological Priorities Between Now and the Year 2000, Report to the National Science Foundation, IES Working Paper 20 (Madison, Wisconsin: Institute of Environmental Studies, June 1974), p. 9-12.

61. The statistic may be misleading because for one thing the drop in temperature increases towards the poles. The average drop in temperature at the 80°N parallel, for example, is reckoned to be about 3°C but when these extreme changes are averaged for the entire earth's surface the mean is observed to be very small.

62. Author's interview with Professor Reid A. Bryson, Director of the Institute of Environmental Studies, University of Wisconsin-Madison, Madison, Wisconsin, October 16, 1978.

63. IFIAS Workshop, Bryson, et al., op. cit., p. 10.

64. Bryson, et al., op. cit., p. 8.

65. Reid A. Bryson and Thomas J. Murray, Climates of Hunger: Mankind and the World's Changing Weather, (Madison, Wisconsin: University of Wisconsin Press, 1977), p. 144.

66. H. H. Lamb, "Volcanic Dust in the Atmosphere; with a Chronology and Assessment of Its Meteorological Significance", Philosophical Transactions of the Royal Society of London: Mathematical and Physics Sciences, 266 (1178), pp. 425-533. Lam's arguments are summarized in Bryson and Murray, op. cit., pp. 147-48.

67. S. Manabe, and R. T. Wethesald, "Thermal Equilibrium of the Atmosphere with a Given Distribution of Relative Humidity", Journal of Atmospheric Sciences, 24(3), pp. 241-259; cited in Bryson and Murray, op. cit., p. 144.

68. Reid A. Bryson, "Drought in Sahelia: Who is to Blame?" Ecologist 3(10), pp. 366-371; cited in Bryson and Murray, op. cit., p. 136.

69. Bryson and Murray, op. cit., pp. 134-135.

70. Ibid., p. 26-28.

71. Author's interview with Bryson, op. cit.

72. Annual Coffee Statistics, (New York: Pan American Coffee Bureau, 1975), Table P-8, p. A-104.

73. Arthur T. Cardell, The Brazilian Soluble Coffee Problem: A Review, Quarterly Review of Economics and Business, Vol. 9, #1, Spring 1969, p. 30.

74. M. Alvetz and H. E. Foote, Coffee Processing Technology, Volume 2, (Westport: Avi, 1963), p. 3, cited in Cardell, op. cit., p. 30.

75. Cardell, op. cit., p. 30.

76. Lawrence, et al., op. cit., pp. 405.

77. Coffee Drinking in the United States, Winter 1976, (New York: Pan American Coffee Bureau, 1976), p. 3.

78. Industrial Coffee on Twenty-one European Markets, (Geneva: UNCTAD/GATT, International Trade Center, 1969), p. 95.

79. Gerd Boschn, "Consumption Stagnates Yet Coffee Still Most Favorable Beverage", Tea and Coffee Trade Journal, Vol. 146, #12. December 1974, p. 26.

80. Frieder Rotzoll, "Golden Cup Days are Waiting: Market Comers are Yet Unturned". Tea and Coffee Trade Journal, Vol. 146, #12. December 1974, p. 28.

81. Boschn, op. cit, p. 26.

82. de Vries, World Coffee Market, op. cit., p. 24.

83. UNCTAD/GATT, Industrial Coffee,p. 69.

84. Ibid., p. 95.

85. Ibid., p. 117.

86. Ibid., p. 124.

87. Boschn, op. cit., and Rotzoll, op. cit.,p. 27.

88. UNCTAD/GATT, Industrial Coffee, p. 31.

89. Ibid., PACB, Coffee Statistics,p. 85.

90. Ibid., p. 84.

91 UNCTAD/GATT, Industrial Coffee, p. 37.

92. PACB, Coffee Statistics, op. cit.

93. Cesare Cavalleri, "Coffee Industry in Italy: Survival of the Fittest," Tea and Coffee Trade Journal, November 1977, p. 17.

94. Ibid.

95. Pan American Coffee Bureau, Annual Coffee Statistics, 1973, (New York: PACB; 1974), p. 100.

96. John C. L. Hulley, and Patrick Yeung, "The World Tea Market", in Singh et al., op. cit., Table 19, p. 69.

97. Patricia Tisdall, "An Instant Guide to Coffee Prices," The Times (London), April 19, 1977, p. 16.

98. Patricia Tisdall, "Instant Coffee Prices in the Melting Pot," The Times (London), August 1, 1977, p. 17.

99. UNCTAD/GATT, Industrial Coffee, p. 18.

100. Tazo Tomizawa "Bitter-Sweet Consumption Pattern," Tea and Coffee Trade Journal, June 1978, pp. 14-15.

101. UNCTAD/GATT, The Market for Soluble Coffee in Canada and Japan, (Geneva: UNCTAD/GATT, International Trade Center, 1971), p. 41.

102. Rudolf Tchan, "Instant Profits for Coffee," Business Week, May 1, 1977, p. 40.

103. UNCTAD/GATT, Market for Soluble Coffee, p. 40.

104. Rourk, op. cit., p. 24.

105. PACB, Coffee Statistics 1975, Table 45, p. 75.

106. de Vries, World Coffee Market, p. 26.

107. PACB, Coffee Statistics 1975, Table C-6, p. A-89.

108. Assume that we need 200 cups of coffee and that one pound of regular coffee yields 100 cups. We will need two pounds or regular coffee which has been obtained from 2 x 1.19 = 2.38 pounds of green coffee to meet this consumption requirement. On the other hand, since soluble coffee yields 50 per cent more cups per pound than regular coffee, one pound of soluble coffee would produce 150 cups. Therefore we would need 200/150 = 1.33 pounds of soluble coffee or 1.33 x 2.5 = 3.33 pounds of green coffee to satiate this need.

CHAPTER V

COFFEE POLICIES: BACKGROUND AND RECOMMENDATIONS

Ongoing Production Programs

Since 1976, Tanzania has been implementing a coffee improvement program (CIP),[1] which is geared to raising the country's coffee production by some 50 per cent to 1.1 million bags over the five years ending in 1980. Also during this period of time, the program aims at increasing the proportion of production falling in the top 5 quality classes from 15 to 25 per cent of the total.[2] This program, which is financed half and half by a Sh. 130 million (about $16 million) grant from the European Economic Community and a special production levy imposed by the Coffee Authority of Tanzania (CAT), intends to attain its objectives by recruiting and training a specialized coffee extension staff at the rate of one for every 1000 smallholders (300 hectares) included in the project. The field staff are provided with motorcycles at the local level and four wheel drive motor vehicles at the district and regional levels for ease of mobility in the countryside. The program avails the necessary production inputs including fertilizers, chemicals and the application gear for plant protection, and hand pulping equipment. In addition, it provides subsidies and credit for smallholders to purchase these inputs. Finances are provided under the program to revitalize and improve existing pulperies and to build some new ones, as well as improve access roads in the project areas. Furthermore,

program funds will be used to expand coffee training facilities at Lyamungu, Mbozi and Maruku, and expand storage capacity in the south of the country where this capacity is inadequate. This program is being implemented in six regions of the country -- Kilimanjaro, Arusha, West Lake, Mbeya, Ruvuma and Tanga, and will cover 110,000 hectares of coffee.

In addition, with effect from 1978, the CAT has embarked on a coffee expansion program (CEP) with the object of increasing Tanzania's production by 46 per cent over a period of four years.[3] The program contemplates an expansion of coffee in areas identified as being suitable for production but are presently producing relatively little or no coffee. This Sh. 251 million (about $31 million) program is geared to raising some 80 million coffee seedlings which, it is believed, will suffice for a projected 60,000 hectare expansion in five and probably eight regions of the country -- Mara, Ruvuma, Iringa, Mbeya and West Lake, and probably Tanga, Kigoma and Morogoro regions. (The program has started in the first five regions but as of early 1978, the decision was not yet made on whether the latter three regions would be included). In all, it is intended that some 170,000 people will be able to realize increased incomes from this program. CEP costs include some infrastructural investments in feeder road and staff housing construction, as well as production, processing and transportation equipment necessary to service the nurseries and the expanded production area.

As may be implied from our discussion this far, these programs are a welcome move. The question that remains to be answered is what

are the prospects of these programs' success. The answer to this question entails both technical and administrative or organizational considerations. We start with a look at the technical possibilities.

Increased Coffee Production: Technical Potentialities and Policy Options for Tanzania

Technically, production may be increased by expanding the area planted to coffee (extensification) or by increasing yields from the existing coffee area (intensification).

Increasing Production by Intensification

Coffee yields in Tanzania are very low, especially in the smallholder sector, as is demonstrated by the statistics in text Table 32.

TABLE 32

COFFEE YIELDS IN THE ARUSHA AND KILIMANJARO AREAS
(kilograms of green coffee per hectare)

	Estates		Smallholders	
Period	Arusha	Kilimanjaro	Arusha	Kilimanjaro
Late 1960's	532-1,566	693-1,405	301	341
1972/73	1,133	1,270	427	691

Note: Conversions used: 1 hectare = 2.46 acres.
1 cwt. (112 lb) = 0.85 bag.
1 bag parchment = 0.8 bag green.

Source: L. L. Rutahakana, J. A. Rweyemamu, and W. C. M. Maxwell, An Analysis of the Tanzania Coffee Industry and a Proposed National Coffee Improvement Plan, 1975-1980, Volume 1, (Moshi, Tanzania: TCB, January 4, 1975), p. 14.

There are two main avenues for increasing production via intensification:

(a) Planting and/or breeding for higher yielding varieties; and

(b) More effective use of production inputs and improved cultural practices.

As may be implied by comparing yields in the estate and smallholder sectors in Part Table 32, yields in the smallholder sector could be trebled without recourse to new research. There is little doubt, however, that new research could produce coffee trees that give a higher output per tree. Research could also be directed towards the development (through plant breeding) of smaller coffee trees with the same or slightly lower yield per tree than the present varieties, but that would make it possible to increase plant population per hectare and thus increase the overall output. In El Salvador, the planting of a new dwarf coffee tree, called pacas, has made it possible to increase the plant population from the 1,400 national average, yielding 1,200 kilograms per hectare, to 8,500 trees in some estates, which, coupled with the adequate application of fertilizers (850 lb. per hectare applied on experimental basis), resulted in yields of 2,880 kilograms per hectare.[4]

However, increasing yields through this form of research is necessarily constrained by a number of factors, not the least of which is the length of time it takes to develop and perfect such varieties. This bottleneck is particularly relevant for coffee since it is a perennial crop. Another serious bottleneck for Tanzania has to do with the availability of competent manpower. Success in this approach requires

highly skilled and experienced manpower as well as sophisticated equipment, both of which requirements are likely to be in short supply in Tanzania. In July 1978 when we visited Lyamungu Coffee Research Station, the country's main coffee research center, it was reported that the station was without a plant breeder. While such personnel could be hired from abroad, the costs involved in their maintenance as well as the procurement and provision of the necessary equipment and facilities, tempt one to believe that Tanzania's limited research funds and talent are best spent on adaptive, input useage and processing research rather than the basic research called for in the foregoing discussion. The country could secure higher yielding and/or disease and pest resistant coffee varieties from other countries that have developed such varieties, through bilateral or multilateral technical cooperation arrangements.

A further bottleneck to the increased plant population alternative of increasing yields has to do with the resulting demand for ground moisture. It has been estimated that coffee requires 45 inches and 30 inches (1,143 millimetres and 762 millimetres) of rainfall per annum under one rain season and two rain season regimes, respectively, for adequate growth and production.[5] According to Lyamungu Coffee Research Station rainfall records, the average rainfall in the Arusha/ Kilimanjaro area, the area producing about one half of the country's coffee crop, was 1,281 millimetres over the five years ending in 1977, which is barely adequate for the present plant population since the second rains are rather precarious. Most of the estates in the country, over 80 per cent of which are in this area, and a few smallholders

whose farms are in the vicinity of rivers therefore irrigate their farms to complement rainfall. The number of smallholders who can irrigate their coffee is limited by locational factors -- most are not located close enough to significant water points, and by the prohibitive cost of channeling water for long distances or digging and pumping water from tube wells or dams. Rainfall is better in the southern and western coffee areas of the country, averaging 1,680 millimetres and 2,152 millimetres over the five years prior to 1977, but is in no way adequate for a doubling of moisture requirement which is likely to result should plant population increase to anywhere near the scale achieved in the Salvadorean example.

It is estimated that in recent years the Coffee Berry Disease (CBD) has been responsible for a 20 to 25 per cent crop loss in the Arusha and Kilimanjaro regions.[6] Other pests and diseases, particularly Antestia (an insect), the White Stem Borer and Leaf Rust, take a considerable toll of production in this area. In West Lake Region, the Coffee Berry Borer (CBB) is said to be responsible for the destruction of about 50 per cent of the crop, with an additional 20 per cent being destroyed by other pests.[7]

In view of this magnitude of crop damage, the CAT believes that the successful eradication of pests alone could increase Tanzania's production by 50 per cent. There is substantial evidence attesting to this belief. A leaf rust control experiment conducted in Mbozi area, using copper spray on three estates and six smallholdings between 1960 and 1962, revealed that the countrol program increased yields

by 61 per cent on the estates and 147 per cent on the smallholdings. The details of these results are reproduced in text Table 33.

TABLE 33

EFFECTS OF COPPER SPRAYING ON YIELDS (1960-62)
(clean coffee in kilograms per hectare)

	Treatment	
	A Unsprayed	B Sprayed
Estates:		
Mean yields	459	738
Per cent of A	100	161
Smallholdings:		
Mean yields	261	645
Per cent of A	100	247

Note: The original results were given in cwt/acre. We have converted them to kilograms per hectare using the conversions:

1 hectare = 2.46 acres.
1 cwt. = 112 lb.
1 kilogram = 2.204 lb.

Source: CAT records.

In another trial in which copper spraying was combined with fertilizer application, the results were even more dramatic as is shown in text Table 34.

TABLE 34

THE EFFECTS OF COPPER SPRAYING AND FERTILIZER APPLICATION ON YIELDS (1962)

(clean coffee in kilograms per hectare)

Treatment	A Unsprayed	B Sprayed	Results of B as per cent of A
A Unfertilized	534	1,576	295
B Fertilized	736	2,054	279
Results of B as Per cent of A	138	130	385

Source: CAT records.

Apart from the application of fertilizers, and disease and pest control chemicals, cultural practices including appropriate spacing, inexcessive shading of plants, mulching, pruning, weeding, etc., also help increase yields. A four-year experiment conducted to asses the effects of differing densities of bananas interplanted with coffee on the yields of the latter, confirmed that coffee yields deteriorate appreciably as the numbers of interplanted banana trees increase. The results of the experiment are summarized in text Table 35.

It should be noted that Tanzania neither exports bananas, nor, for the most part, is there a major organized domestic trade in the commodity such as there is in maize, for example. In the case of maize and some other food crops, the commodities are purchased from producers all over the nation, processed, and sold for consumption nationwide. Bananas, on the other hand, remain primarily a subsistance commodity

which producers sell usually to obtain cash with which to buy subsistence goods from fellow peasants at local shops. This income, being thus realized in so small installments, does not easily lend itself to use for major investment expenditures, such as housing, for the farm family. It therefore makes good sense, from a development policy point of view, to discourage increased production of bananas if such increase is going to be at the expense of coffee production.

The interplanting of bananas and coffee is of concern in Tanzania because in most smallholdings the two crops are interplanted, coffee being a cash crop while bananas provide both cash and food for the family. As we pointed out in Chapter I, bananas have been shown to generate more cash income for the smallholders than coffee. It is therefore common that producers will encourage too large a banana tree population which overshades and outcompetes coffee trees for essential soil nutrients, resulting in reduced coffee yields as is evident in Table 35.

It is clear from the foregoing that Tanzania stands to gain from the application of fertilizer, pesticides and fungicides. In recent years, however, the cost of these applications has risen to levels beyond many smallholders' reach. To cite a few examples, the recommended rates of Sulphate of Ammonia (SA) and Ammonium Sulphate Nitrate (ASN) is 680 kilograms per hectare. At 1975 prices, this translates to Sh. 1428 (about $178) for SA and Sh. 1904 (about $238) for ASN per hectare for Arabicas.[8] The Robustas are deemed to require only 150 kilograms of ASN per hectare,[9] which in 1975 prices works out

TABLE 35

EFFECTS OF INTERPLANTING BANANAS WITH COFFEE ON COFFEE YIELDS: 1960-63

(clean coffee in kilograms per hectare)

	Number of Banana Trees			
	A Nil	B 100	C 200	D 400
Arabica:				
Mean yields	423	310	296	225
Per cent of A	100	73	70	53
Robusta:				
Mean yields	341	216	121	118
Per cent of A	100	63	35	35

Note: Original results were given in cwt/acre; we have converted them to kilograms per hectare using conversions in text Table 33.

Source: CAT records.

to be Sh. 420 (about $52) per hectare. The cost of CBD control is estimated to range from Sh. 1500 (about $188) to Sh. 3,500 (about $438) per hectare,[10] while that of controling insects and fungi is put at Sh. 205 (about $26) and Sh. 412 (about $52),[11] respectively. The overall package for Arabica inflicted with CBD is Sh. 3,545 to Sh. 6,021 or $443 to $763 per hectare per annum. The package cost for Robustas is much smaller -- it only includes Sh. 420 for ASN and Sh. 205 for pest control chemicals, totaling Sh. 625 or about $78 per hectare per annum.

The experimental results we have cited above are subject to rather

serious weaknesses, not the least of which is the limited number of replications. In the case of the joint effect of fertilizers and copper fungicide, for example, the results are those of a single year (1962). Regardless of the number of replications of the treatment done during that year, and our source did not disclose the details, one is bound to question the extent to which the results of a single year's trial, reflecting in part the agronomic and environmental conditions of that year, may be generalized to form a good basis for policy making. Furthermore, specific treatments on experimental scale are likely to yield more remarkable results than when similar treatments are applied under field conditions. In an insect control experiment, for example, experimental farms may be so selected as to preclude significant insect migration between the experimental farm and other farms. Under field conditions such preclusion is not possible. Our source of experimental data did not detail the experimental design or explain the extent to which the experimental conditions resembled typical field conditions, so that it is not possible to evaluate these results on this score.

In addition, some of the results outlined here may easily be out-of-date. Insects and disease causing agents develop resistance and/or undergo mutations that render them immune to specific control treatments. Input costs and returns change over time, a consideration which is particularly relevant in the post-OPEC period. Any application of the recommendations emanating from these results, therefore, will have to take into consideration more up-to-date experimental and field

trial data and be supported, on a continuing basis, by adaptive research aimed at updating recommendations and testing new inputs and planting materials for adaptability under specific Tanzanian conditions. As for the present, however, in the absence of more adequate data and considering the conspicuousness of the difference between the treatments in most cases, it would appear that the results we have outlined are very instructive, perhaps sufficiently instructive for our present policy recommendation development purposes.

These results in combination with the cost statistics we have noted above, form, it would appear, a reasonable basis for policy recommendation on the choice of technology for Tanzania in the context of our discussion to date. Our discussion on the possibilities that further research offers, reveals that at least in the short and medium term, the next 5 years, say, we can expect no major new breakthrough, beyond what is already known today. The results recorded in text Table 34 reveal that fertilization caused yields to increase by 38 per cent when no copper spray was applied and 30 per cent when the spray had been applied. Unfortunately, our source did not indicate which fertilizer or combination of fertiliziers was used or their rates of application, although one would suspect that both the fertilizers used and their rates of application were or resembled those we have noted above as being recommended. The results show that copper spraying alone (without fertilization) caused yields to increase by 195 per cent, while when the spray was applied along with fertilization, the yields rose some 179 percentage points. These results are particularly

remarkable when the combined effect of the two inputs is compared with the control treatment (no copper spray, no fertilization); the yields differ by 285 per cent.

It is clear that given Tanzania's resource constraints, the country should concentrate on plant protection and basic cultural practices, including the proper spacing of coffee and banana trees. It is also clear that there is need for reappraisal of the relative merits of the government and CAT supporting increased production of Arabicas and Robustas in view of the respective costs of production and controlling diseases and pests in the respective coffee types.

Increasing Production Through Extensification

Tanzania's potential for increasing her coffee production through extensification appear to be good. The CAT has identified for its Coffee Expansion Program (CEP) some 60,000 hectares of land suitable for coffee production in 5 regions of the country, as is shown in text Table 36.

TABLE 36

AREAS IDENTIFIED UNDER CEP FOR NEW COFFEE PLANTINGS

(hectares)

Region	Arabica	Robusta	Total
Mara	2,000	2,050	4,050
West Lake	-	20,400	20,400
Iringa	7,550	-	7,550
Mbeya	19,500	-	19,500
Ruvuma	8,723	-	8,723
Total	37,773	22,450	60,223

Source: CAT, Coffee Expansion Programme, 1978-1982, Volume 1, Program Analysis, (Moshi, Tanzania: CAT, February, 1978), Table 3, p. 21.

These areas are deemed to meet the agronomic requirements for satisfactory coffee production. The annual rainfall is adequate, the temperature requirements, i.e., a maximum day temperature of 31.1°C and a minimum night temperature of 7.2°C with an annual range of 5.5°C to 20°C, are also met. Whereas complete soil tests have not been carried out, the soils are said to resemble those of the present coffee growing areas both in visual appearance and in terms of the natural flora they support. Where soil acidity tests (pH tests) have been carried out, the soils have been found to meet the 4.6 to 7.5 pH levels required for coffee. These soils are also found to be sufficiently deep, at least 6 feet deep, and freely draining. As mentioned

earlier, some areas in Kigoma, Morogoro and Tanga regions, all of which areas already produce some coffee, are being considered for inclusion in the expansion program.

Probably the most important decision relating to extensification is that of the scale and/or organization of production. As we mentioned earlier, coffee is produced in Tanzania in three organizational setups — individual smallholdings, ujamaa production units, and estates. We also mentioned earlier that the conventional estate is a declining production unit in Tanzania, mainly because of the nationalization of privately owned estates which is now almost complete, and the lack of public sector enthusiasm in starting new coffee estates. Apart from the apparent uninviting political attitude towards large scale private investment in agricultural production in Tanzania, the availability and cost of labor are a major problem, even to the publicly operated estates. Historically, the Tanzania estate sector has depended on foreign sources, Burundi and Mozambique in particular, for the bulk of its labor force. Within the country, estate labor could only be obtained from a limited number of regions. In most other areas estate work was viewed scornfully; people preferred to farm their own land. With the advent of independence in Tanzania and the neighboring countries, the sense of pride in selfemployment tended to increase within Tanzania at the same time as supplies of migratory labor from the neighboring countries were quickly drying up. Supplies of workers from other countries dwindled, both as a result of increased bureaucratic intricacies that now limited free travel between the newly independent

countries, and Tanzania's own foreign exchange regulations which limited the amounts of money that such workers could repatriate.

Furthermore, independence also brought major increases in farm wages, thus further compounding the already serious labor problem. As we mentioned earlier, automation in coffee is either prohibitively expensive or in many cases impractical, at least with the existing technology. Also, as already mentioned, for success in new estates production it will be necessary to employ a very high level of technology, in line with Rourk's "all or nothing warning" cited earlier. This approach is therefore likely to be too costly and risky and thus tend to dangerously erode Tanzania's competitive edge over other producing countries, particularly those in Latin America, most of which depend on such high technology-intensive techniques. This concern becomes particularly valid when we consider the relative managerial talent and experience available to Tanzania and that available to the Latin Americans.

Many factors point to the favorableness of the smallholder sector in the expansion of coffee production in Tanzania. Here the cost of production can be kept at a minimum — mainly family labor is employed and the level of technology may be kept at a minimum without fear of reducing yields to below economic levels. This approach, however, requires considerable investment in public services, including a capable extension service and low cost credit facilities and/or public subsidies for basic inputs, such as chemicals for plant protection and the necessary application equipment. This approach also allows for

participation in the production process of a greater proportion of the population, thereby facilitating greater equality of income distribution. In a country like Tanzania, where the mass of the population is largely outside the monetary economy, this approach presents a major opportunity for economic progress. However, as mentioned earlier, the approach is likely to be slow to yield the desired increase in production.

The ujamaa production unit or village is a cross-breed between a conventional estate and a smallholding. The producers share the chores and proceeds from the communal production entity. This pooling of production effort enables the village to enjoy some of the economies of large scale enjoyed by the conventional estate without experiencing the labor problems and high costs of allout technology. The village also retains most of the income distributional advantages of smallholder production. Inherently such a village is more creditworthy than the individual smallholders working alone. The larger production unit lends itself to greater efficiencies in receiving and using public technical advice and services. Lastly, but very significantly, of the three approaches, ujamaa villages have the greater political sympathy in the country and as such are likely to receive a disproportionate share of government attention and services. It must be emphasized, however, that since ujamaa villages are primarily socio-political entities and only secondarily economic agents, success hinges on the degree of social and political dedication of the participants to the common course and the organizational ability and

commitment of the leadership, qualities which are not always easy to come by. Where these prerequisites are present, the likely visible economic gains from coffee production will provide an additional cementing force to the village's cohesion and prosperity.

What Type of Coffee to Produce

Our discussion on market trends did not result in an unequivocal conclusion as to the advisability of concentrating production on either Colombian Mild Arabicas or Robustas. We saw that during the 1950's and 1960's the Robustas made some very marked market gains but in recent years the tide has tended to shift in favor of the milder coffees, the Arabicas. We made reference to a number of arguments which tend to point to a relatively brighter future for the milder coffees, but much remains uncertain.

In its history as a coffee producer, Tanzania has tirelessly cultivated a reputation of being a high quality coffee producer. This was a very prudent policy during the operation of the ICA's quota system -- given a fixed quota of exports one wanted to fill that quota with the most valuable, usually highest quality, coffee, thus maximizing the foreign exchange earnings from overall coffee exports. Partly as a consequence of this preoccupation with quality production, the Robustas and Hard Arabicas suffered considerable neglect. Now with the quotas suspended and the quota system itself being much more flexible than it was under the previous ICAs, it is proper for Tanzania to reappraise its attitude regarding quality coffee production, for now

quality is but one (not the only) way of improving the country's export earnings from coffee. There is need now to be openminded and direct coffee investment funds where they are likely to yield the most return in foreign exchange earnings at the lowest cost.

We have seen in this discussion that the Robustas, indeed the hard coffees (Robustas and Hard or Unwashed Arabicas), are cheaper to produce -- they require no pulperies; as compared to the mild coffees they succumb to fewer serious diseases and pests, and generally they are easier to produce and as such require less agricultural extension advice. As the Tanzanian Ministry of Agriculture's Market Development Bureau (MDB) estimates in text Table 37 indicate, the production of Robusta coffee requires a smaller outlay of both labor and finances.

These estimates also show that, at least at the 1977 prices and yields, the Robustas yield a higher net return per unit of labor and cash outlays. Clearly, according to these estimates, there is advantage both for the farmers and the national economy in producing Robusta coffee. This is particularly true considering that the cost of controlling CBD, about 75 per cent of which is met by a government subsidy, has not been inputed in the production cost of Arabica coffee. We have seen, however, that market trends are tending to move in favor of the Arabicas, so that any future policies will have to consider both aspects -- production costs and returns and market trends.

TABLE 37

COSTS AND RETURNS FOR SMALLHOLDER PRODUCTION OF ROBUSTA AND ARABICA COFFEE: Mid-1977

	Arabica		Robusta	
	Typical Producer	Progressive Producer[a]	Typical Producer	Progressive Producer[a]
Production outlays per hectare:				
Cultural practices[b] (Sh.)	40	40	10	30
Fertilizers and pesticides (Sh.)	50	473	-	150
Marketing[c] (Sh.)	10	20	10	20
Depreciation on equipment[d] (Sh.)	50	110	-	-
Establishment cost allowance (Sh.)	500	525	200	225
Total financial outlays (Sh.)	650	1,168	220	425
Labor outlay[e] (mandays)	130	355	73	225
Total Returns:				
Producer receipts (Sh./Kg., clean)	17	18	16	16
Yields (Kg./ha., clean)	300	1,200	225	1,000
Producers' total returns (Sh./ha.)	5,100	21,600	3,600	16,000
Net Returns:				
On land (Sh./ha.)	4,450	20,432	3,382	15,575
On cash outlays (Sh.)	6.85	17.49	15.36	36.65
On labor (Sh./manday)	34.23	57.53	46.30	61.08

Notes:

[a] Smallholder following recommendations.

[b] Including weeding, mulching and irrigation

[c] Cost of gunny bags and transportation to buying center.

[d] Including pulping and spraying equipment.

[e] For pruning, harvesting, processing (pulping and/or drying).

Source: "Price Policy Recommendations for the 1978/79 Agricultural Price Review, Annex 10, Coffee," (Dar-es-Salaam: Market Development Bureau, Ministry of Agriculture, August, 1977), Table 3.4, p. 14 and Table 3.5, p. 16.

We have also mentioned earlier that the Brazilian share of the market is drifting away and being captured by other producers. The Brazilians produce Unwashed Arabicas; therefore, as they fade out of the coffee picture, there is likely to be a growing unsatisfied demand for this type of coffee. Unwashed Arabicas are largely the same as Mild Arabicas minus the wet processing. This means that should the market price warrant, coffee that is usually destined for processing into Mild Arabica could be easily processed into Unwashed Arabica. This is to say that Arabica coffee has a high degree of versatility which is very advantageous in an uncertain market situation as appears to exist now and for the next several years.

This welcome flexibility may be further enhanced by encouraging the increased production of both types of coffee. That way the country benefits from both the low production costs of Robustas and the price margin that the Mild Arabicas offer, as well as keeping open the option of competing in the Unwashed Arabicas market when and if such an opportunity should present itself.

The Geographical Dispersion of Production

Coffee production in Tanzania is centered in the northeast and northwest of the country but there are pockets of coffee producing areas scattered all over the country (see map p. 14). In view of our discussion this far, this is a welcome situation for several reasons. Firstly, as we have seen, the present centers of coffee production are rather heavily infested with coffee diseases and pests, the control of which

causes the costs of production to rise rather astronomically. Furthermore, as a consequence of relative affluence resulting from better incomes from coffee in these areas, the availabiility of labor has greatly diminished and its cost increased considerably. This causes major problems during peak labor periods, especially at harvesting time when producers, including smallholders, need some extra hands to complement the permanent or family labor force and complete harvesting and primary processing timely so as to minimize loss or deterioration of the crop's quality that may result from late harvesting. The spreading out of coffee production to areas which have hitherto produced only insignificant proportions of the country's crop, if at all, and as such are largely free from the major coffee pests and diseases, and/or areas where the living standards are relatively lower and labor availability greater at more reasonalbe rates, will reduce the costs of production considerably and thus increase the country's competitiveness in the world market.

Secondly, as our discussion on the trends of weather conditions has indicated, the future promises greater instability in these conditions. We have seen that the Monsoons, the main agents of rainfall in Eastern Africa, will tend to shift more frequently, thus increasing probabilities of droughts and excessive rains over the years. In these circumstances, the country stands to gain by decentralizing its coffee production so that production shortfalls that may result from adverse weather in one area of the country are mitigated by increased or steady production in other areas. In this regard it is encouraging

that the CEP contemplates the spread of production from the north to the south as well as the east and the west of the country.

We have mentioned elsewhere that coffee is a high value commodity that provides its producers with returns on investment that are higher than most other agricultural commodities. The dispersion of the commodity's production to many parts of the country will therefore bring with it a large measure of income distribution around the country, particularly where production is carried out on smallholder or ujamaa village basis.

Marketing Policies: Domestic

Producer Price Stabilization, and the Quantity and Quality of Production

Many of the arguments advanced earlier regarding stability in the context of a national economy are also of interest to an individual farmer. Increased predictability of income makes for easier and more efficient planning and execution of production programs. In addition, measures designed to bring about price or income stabilization may be tailored so that they also bring about desired trends in the volume and/or quality of production. To the extent that farmers react to changes in the anticipated price of the commodity they produce by increasing or decreasing production effort, these prices may be varied to increase, decrease or maintain the volume or quality of the commodity produced. Critical factors in these relationships are the price elasticities of production -- their values and signs.

As text Table 10 indicates, the supply of c

price-elastic even in the short-run (one year). Maitha has estimated the price elasticity of coffee acreage in Kenya to range from 0.152 to 0.204 in the short-run and from 0.379 to 0.511 in the long-run. He estimates price elasticity of productivity to range between 0.637 to 0.657 in the short-run and 0.955 to 0.985 in the long-run.[12] Maitha's results are reproduced in text Table 38.

TABLE 38

PRICE ELASTICITY OF ACREAGE AND PRODUCTIVITY ESTIMATES FOR KENYA COFFEE

	Acreage		Productivity	
	Short-run	Long-run	Short-run	Long-run
Industry	.152	.379	.637	.955
Estates	.159	.397	.657	.985
Smallholders	.204	.511	.644	.965

Source: J. K. Maitha, "A Supply Function for Kenya Coffee", East African Economic Review, Vol. 1, #1, 1969 and Vol. 2, #2, 1970.

These elasticity estimates imply that if producers are informed of a guaranteed price about a year or two in advance, they will step up their efforts to increase their production mainly through intensification but also by extensification -- they are likely to apply more fertilizers and pesticides, harvest more carefully and completely as well as plant more coffee.

The potential quality of coffee produced is the combined result of natural biological factors, especially the genetic makeup of the particular type of coffee grown, and the weather as well as agronomic conditions under which the particular coffee crop was produced. However,

regardless of these biological and natural endowments as well as the agronomic practices used, the realization of a particular crop's quality potential largely depends on the type and thoroughness of processing. According to the CAT:

> Although intrinsically poor coffee cannot be improved by any amount of processing, good coffee can be ruined by bad processing to the extent of attaining only half of its potential quality.[13]

Under Tanzania's pool system of producer price determination, a system of "price differentials" is employed to induce growers to produce better quality coffee. Under this system, at the end of each coffee year each producer's final price is calculated on the basis of the average price realized during the year for the quality class under which his coffee was classified. This average price is then weighted by a percentage differential index designed to penalize poor quality coffee and reward coffees of higher quality. In text Table 39 we present the coffee classification chart for 1970/71, as well as the class average realized prices, the differential scale for that year, and the resulting producers' price as an example of how the system operates.

In view of the heavy dependence on quality potential realization on processing and agronomic practices, it would appear that if the quality class price differentials were determined early enough and the resulting producer prices for the various quality classes announced on a guaranteed basis, say, one year in advance, coupled with adequate publicity and extension advisory work, producers could be induced to increase efforts towards better quality coffee production. Needless to

TABLE 39

C.A.T. COFFEE CLASSIFICATION CHART FOR 1970/71 AND THE PRODUCERS' PRICE DETERMINATION

Class	GRADES									Average Realized Price (Sh./bag)	Price Differential Scale (%)	Producers' Price (Sh./bag)
	AA	A	PB	B	AF	E	TT	C	F	HP	UG			
1	FINE											-	130	-
2	GOOD											523.08	120	627.70
3	FAIR GOOD		GOOD FINE									460.31	[illegible]	515.55
4	FRAQ+		FAIR GOOD			GOOD						438.92	[illegible]	469.54
5	FAQ		FAQ+			FAIR GOOD						436.34	[illegible]	436.34
6	FAQ-		FAQ			FAIR GOOD						394.38	95	374.66
7	POOR FAIR		FAQ-			FAQ+						389.56	93	362.29
8	POOR		POOR FAIR			FAQ			GOOD			378.58	80	302.86
9			POOR			POOR FAIR			FAIR GOOD			363.58	77	279.95
10						POOR			FAQ			356.11	73	259.96
11									POOR FAIR			372.25	60	223.35
12									POOR			338.06	55	185.94
13	GOOD BUNI								VERY POOR			231.72	50	165.86
14	FAIR GOOD BUNI		FAIR BUNI									262.08	45	117.94
15	FAIR BUNI		FAIR BUNI			GOOD BUNI						273.16	40	109.26
16	POOR BUNI		POOR BUNI			FAIR BUNI			FAIR BUNI			244.46	30	73.34
17	UNCLEAN		UNCLEAN			UNCLEAN			UNCLEAN			290.94	25	72.74
Tex.	If sold at all, uplifted to class 17.													

Notes: (i) Apparently only an insignificant amount of class 1 coffee was sold during the year.
(ii) TCB gives average realized price in Sh./50 kilo bag; we have converted this to Sh./ kilo bag for consistency with the rest of our present exercise.

Sources: (i) Classification Chart and the Price Differential Scale: Paul W. Westergaard, "The Internal Marketing System for Arabica Coffee", ERB Paper #3, (Dar-es-Salaam: Economic Research Bureau, University of Dar-es-Salaam, September, 1970).
(ii) Average Realized Price: L.L. Rutahakana, J.A. Rweyemamu, W.C.M. Maxwell, An Analysis of the Tanzania Industry and a Proposed National Coffee Improvement Plan, 1975-1980, Vol. 1, (Moshi, Tanzania: Tanganyika Coffee Board, January 4, 1975), Table 12, p. 23.

say, the resulting degree of quality improvement will again depend on the direction and magnitude of growers' response to price incentives. The price elasticities in text Tables 11 and 37 all indicate positive responses of production to price changes, there is no reason why producers should not respond positively to price incentives for quality production.

There is little doubt that the operation of a price stabilization scheme of the sort envisaged here, calls for an exceptional ability to forecast future market prices. However, as we have seen future coffee prices cannot be predicted with much confidence due to the unsystematic nature of the factors that influence these prices. This problem may be surmounted by the creation of a price stabilization fund.

Such a fund may be created by syphoning off some percentage of coffee export revenues during years of high prices. Presently the Tanzanian government levies a rather heavy export tax on coffee. Some of the proceeds of this tax could go towards the creation of such a fund. By design the tax rate varies with the level of realized export price. This means that the tax's proceeds are largely indeterminate. It is therefore unlikely that these proceeds are rigidly earmarked for any specific programs, although since 1972/73, a portion of the proceeds (20-60 per cent between 1972/73 and 1975/76)[14] has been returned to the coffee industry to subsidize CBD control efforts. It is unlikely, therefore, that the use of some of the proceeds to support the fund, here suggested, will cause any major disruption of ongoing programs.

The way the fund would operate is roughly that a market price forecast for a given coffee season would be made, the price differentials scale established and the resulting producers' prices for the various quality classes announced sufficiently early (say, a year in advance) to influence producers' decision-making as to the amount of effort or other resources to put into the production or quality improvement of the season's coffee crop. Should the realized price fall below the announced price, money would be drawn from the stabilization fund to make up for the shortfall, thus guaranteeing the growers' price. On the other hand, if the realized price is higher than the announced price, the excess would accrue to the fund.

The fund's monies, when not in use for price stabilization purposes, could be borrowed by the government or the industry for various development programs such as the support of coffee-related industrialization, e.g., coffee processing, or diversification programs in coffee areas where coffee has to be phased out due to high costs of production and/or disease and pest control. We must emphasize, however, the need for caution in selecting these secondary projects for support by the fund to ascertain that the fund does not lose excessive sums of money and/or degenerate into another form of taxation on the producers, and thus be unable to carry out its primary mission of producer price stabilization.

Growers' Prices in Tanzania and Neighboring Countries

Tanzania has common borders with six coffee-producing countries -- Kenya and Uganda to the north, Rwanda, Burundi and Zaire to the west,

and Malawi to the south. While there is no hard statistical evidence of coffee trafficking across national borders, one must say that the potential for such coffee movement is very considerable. This potential may in part be implied from the producer price differences between these various countries as is shown in text Table 40.

TABLE 40

PRODUCER PRICES IN TANZANIA AND NEIGHBORING COUNTRIES:[a] 1971-76

(in US cents per pound green equivalent)

	1971	1972	1973	1974	1975	1976
Tanzania	41.20	45.09	52.63	38.76	31.75	59.31
Kenya	34.55	42.93	54.16	62.90	59.69	121.40
Uganda	15.12	15.12	19.32	15.24	15.87	15.24
Rwanda	20.00	21.66	23.77	21.99	21.99	31.76
Burundi	22.84	23.90	26.61	30.06	29.52	37.25
Zaire	9.98	9.98	10.89	16.33	16.33	34.62

Notes: [a] Malawi only joined the ICA in 1978 therefore their data has not been compiled by the ICO, our source.

Sources:

(i) Quarterly Statistical Bulletin on Coffee, April-June 1977, Vol. 1, #2, (London: ICO, 1977). Table IV-13.

(ii) Quarterly Statistical Bulletin on Coffee, April-June 1978, Vol. 1, #2, (London: ICO, 1978). Table IV-15.

In recent years there have been persistent press reports of considerable coffee movement particularly between Tanzania, Kenya and Uganda. The reports note that the direction of these movements is from Tanzania to Kenya, and from Uganda to Tanzania. We should note,

however, that this trafficking of coffee is only minimally, if at all,motivated by the absolute levels of growers' price differentials. Rather, the main motivating factor appears to be the availability of consumer goods, e.g., imported textiles in Kenya that are scarce or unavailable in Tanzania and which can therefore be purchased in Kenya with money received from sale of smuggled Tanzania coffee and resold in Tanzania at very high profits. This reasoning is also true, but in the reverse order, along the Tanzania/Uganda border -- the Ugandans are interested in buying basic consumer goods including sugar, salt and textiles which are unavailable in Uganda.

Clearly, to the extent that the foregoing explanation is appropriate, a producers' price solution will not yield any appreciable results. On the contrary, attempts at such a solution may pose serious social costs in the form of worsening income distribution within the country. An administrative solution in the form of stricter border surveillance may be more appropriate. Needless to day, stricter border surveillance will call for increased costs to the government. It will be necessary therefore, in formulating future policies on this matter, to properly weigh these additional costs against the potential gains from abated coffee smuggling. An alternative or complementary measure could be for Tanzania to negotiate agreements with Kenya and Uganda for mutual border surveillance and/or coordinated coffee policies that would make contraband unattractive. However, political differences that plague relations between these countries, make such agreements difficult, at least for the time being.

Stocks Management and Product Uniformity

We have argued for increased production because prospects for the future seem to indicate that the world will not be faced with large surpluses for extended periods of time. Under these conditions, the withholding and proper management of such stocks, rather than dumping them in the market when prices are extremely low, has a greater chance of being profitable given the increased market instability that the future seems to promise. The adoption of such a policy strategy for Tanzania, calls for a reappraisal of the country's existing storage capacity.

Firstly, there is the question of the suitability of the existing storage capacity for a sound stocks management program. Previously, Tanzania did not have a stocks withholding policy as a marketing strategy. Consequently, the country's storage capacity is likely to have been constructed for transitory storage, not for the prolonged storage that is called for under a stocks withholding marketing strategy.

Secondly, there is the need for proper coordination between increasing production which results in increased probability of surpluses and therefore demand for specialized long-term storage capacity, and the general increase in transitory storage capacity that the increase in production will call for. Such coordination will help minimize the probability of excessive idle storage capacity, particularly since the long-term storage facilities are likely to be specialized and inappropriate to use for other commodities.

Also, as a way of avoiding unnecessary idle storge capacity, any new transitory storage capacity should be designed to be highly versatile so it can be used for other commodities when coffee stocks are run down.

This concern over the efficient use of storage capacity is closely related to the degree of uniformity in the coffee crop to be stored. As mentioned earlier, the bulk of Tanzania's mild coffee is processed on the farm by individual smallholders using their bare hands or, more frequently, small hand-operated pulperies. Even when an exceptionally good extension advisory service is rendered to the growers, this method of processing results in a large number of small lots of varying quality coffee. The volume per given quality class is particularly small for the top classes, as will be shown later. To avoid adulteration, coffees of different quality classification must be stored in different lots. The low uniformity of Tanzania's coffee therefore makes it necessary to store the crop in a large number of small lots which tend to use up more storage space than would be required if the crop was more uniform and only a few large piles were to be made. The CAT's coffee curing subsidiary, for example, has a 600,000 bag storage capacity in Moshi. The average stock level of the curing works is about 400,000 bags, implying that there is a 200,000 bag excess storage capacity. However, due to the low uniformity of coffee delivered to the works, the entire 600,000 bag storage capacity is used up by the 400,00 bags average stock.[15] Whereas an engineering (design) solution to this inefficient

use of storage capacity could be found, it appears advantageous to concentrate on increasing uniformity, which, as we shall soon see, could have other benefits as well.

The implications of this lack of uniformity in Tanzania's coffee go beyond the economics of storage capacity. It is argued that coffee auction prices in Nairobi (Kenya) are usually higher for the same quality coffee than they are at the Moshi (Tanzania) acutions although both are attended by the same dealers, more or less, because the Kenyan crop is more uniform at any one time and throughout the year. This greater uniformity and therefore the larger lots per given quality class that are offered during a given auction, mean that dealers are more likely to be able to obtain adequate volumes of coffee of specific quality classes during a given auction. Similarly, the greater uniformity of Kenya coffee over a coffee year serves to guarantee dealers that their desired quality coffees will be available in adequate volumes throughout the year. The dealers therefore feel more confident to advise their clients (roasters) to embody such quality coffees in their blends without fear of supplies drying out halfway through the year, necessitating untimely changes of blends. For this reason, it is argued, dealers are willing to pay a little more for Kenyan coffees than for Tanzanian coffees of comparable quality standing.[16]

Before 1974 the difference between the Nairobi and Moshi auction prices for comparable quality coffee ranged between Sh. 10 and Sh. 30 (about $1.25 and $3.75) per bag.[17] Although we lack more up-to-date data, this difference is reported to have narrowed down considerably

since the 1974 order by the Tanzania government requiring that all the country's coffee be exported through Tanzanian ports (previously the bulk of Tanzania's coffee was exported via Mombasa port in Kenya). In addition, it is believed that the increased participation of Tanzanian parastatals (state corporations --GAPEX and CAT's export department) in the Moshi auctions and coffee export business in recent years has contributed appreciably to this reported narrowing of the price gap.[18] If the price gap narrowed as a result of the foregoing, it would tend to support an often-expressed belief in Tanzania that there was a form of collusion amongst private dealers to depress the Moshi prices, so that the price gap may not have been the sole result of the uniformity argument.[19]

The foregoing points to the need for a change from the traditional on-the-farm primary processing to greater use of central processing -- central pulperies. The oldest centeral pulpery (CP) built to serve smallholders was built by the Ngyani-Meru Cooperative Society in Arusha Region in 1959.[20] Following independence in 1961, the number of these pulperies multiplied very rapidly and by 1966 about 30 pulperies were in operation all over the country. The CPs were built and owned mostly by primary cooperative societies with financing from the National Development Credit Agency (NDCA), now the Tanzania Rural Development Bank. The Ministry of Agriculture, through the Coffee Research Station at Lyamungu and the Tanganyika Coffee Board (TCB), provided managerial and technical training and advisory services relating to the CPs' operations. Usually, for book-keeping purposes mainly,[21] a CP was loaned to a single cooperative society for the

exclusive use of its members. The reason for this exclusive use was for ease of recovering loan repayment funds from user members. However, this meant in turn that the burden of the loan also fell on the society's membership, each paying in proportion to his usage of the pulpery.

Traditionally smallholders parted with their coffee (mild coffee) in parchment form, usually in three or four installments a season. With CPs, farmers had to sell their coffee to their cooperative society in fresh cherries form. Unlike parchment coffee, fresh cherries are bulky and heavy. At the same time the CP was usually a long distance away from most prospective user smallholdings. Cherries also have a relatively low value per unit of weight so that, given the usual smallness of smallholder farm sizes (1.2 hectares on average) and the fact that the fruits do not ripen at the same time, hiring transportation was for most producers uneconomical. Most CP users therefore had to deliver their coffee in a few small loads per day and in turn their daily receipts, net of deductions for CP loan repayments and other cooperative expenses, were very small.[22] As we have pointed out before, when income is received in numerous small installments, it tends to be unwisely spent on petty consumption goods rather than major developmental investments, a fact which did not go well with most farmers. Since most growers already had their own hand-operated processing equipment, they preferred to continue processing their coffee at home, thus rendering the CPs grossly underutilized. With only a small number of producers using the CPs, the deductions for CP loan repayments and operational costs were very heavy per user. The CAT reports that during 1967/68 to 1971/72 the per unit cost of operating

CPs was about 50 per cent higher than that of private estate pulperies.[23] These heavy deductions scared away many growers to whom distance, for example, was not much of a problem. Furthermore, some CPs had construction capacity much larger than the coffee output of the areas they were built to serve. Considering all these factors, it is hardly surprising that in Kilimanjaro District, for example, the plant capacity utilization ranged between 20 and 46 per cent between 1963/64 and 1975/76, as is shown in text Table 41.

Reportedly several essential factors were also overlooked during construction. Some plants were built in locations with inadequate water supply, some had inadequate drying space, still others lacked adequate storage capacity. With the CPs facing all the foregoing problems, the original trained management and technical personnel were frustrated by increasing pressure for accountability from a variety of sources including the cooperatives, the TCB and the government. Unable or unwilling to stand these pressures, many of them quit their jobs, leaving many pulperies unable to continue to operate.

TABLE 41

KNCU CENTRAL PULPERY COFFEE OUTPUT VERSUS ESTIMATED CAPACITY

	1963/64	1966/67	1969/70	1972/73	1975/76
Number of CPs in operation[a]	4	11	11	11	11
Capacity of CPs (tonnes parchment)[b]	945	2,598	2,598	2,598	2,598
Output of CPs (tonnes parchment)[c]	283	1,183	512	1,203	1,145
Output as Percent of Capacity	29.9	45.5	19.7	46.3	44.1

Notes:

[a] Wallace's figure of 11 pulperies in 1966/67 has been assumed not to have changed until 1975/76.

[b] Wallace estimates the average capacity of CPs in Kilimanjaro to be 240 tons (236 tonnes) parchment per plant.

[c] KNCU central pulpery parchment coffee deliveries to the curing works.

Sources:

i) R. I. Wallace, "Production of Arabica Coffee in East Africa: Technical and Economic Studies in Bugisu, Meru and Kilimanjaro," unpublished M.A. Thesis, University of East Africa, 1968.

ii) KNCU Annual Reports, (Moshi, Tanzania: KNCU, several issues) and other records.

In spite of these problems, however, CPs are still the main hope for improved uniformity and the overall quality of Tanzania's coffee. The CPs' performance in improving coffee quality is demonstrated in text Table 42.

TABLE 42

QUALITY STANDINGS OF CENTRALLY AND HOME PULPED COFFEE IN ARUSHA REGION COOPERATIVE UNION SOCIETIES: 1968/69 and 1969/70

Quality Class	Centrally Pulped		Home Pulped	
	1968/69	1969/70	1968/69	1969/70
Class 5 or better	61.8	91.5	nil	2.8
Class 6	21.8	8.5	42.0	54.6
Class 7 or lower	16.4	nil	58.0	43.2

Source: L. L. Rutahakana, J. A. Rweyemamu, W. C. M. Maxwell, An Analysis of the Tanzania Coffee Industry and a Proposed National Coffee Improvement Plan, 1975-1980, Volume 1, (Moshi, Tanzania: TCB, January 4, 1975), Table 16, p. 29.

Efforts to revitalize the CPs will have to start with streamlining their ownership and management. As early as 1968, Mbilinyi had suggested that for the CPs' to operate satisfactorily, they should be run under one centralized institution such as the TCB.[24] This still appears to be the only practical way of getting around the kind of problems that caused the collapse of most of the pulperies during the earlier years. Since now the CAT is responsible for the entire industry, in the interest of providing the badly needed streamlining of the marketing process, it seems appropriate for the authority to assume complete ownership and management of the CPs. This reorganiza-

tion will give the CAT a very large measure of control over coffee quality and uniformity and thus enable it to better deal with most of the problems we have outlined above. This move will centralize costs of construction of new CPs or revival and revitalization of old ones, as well as the costs of operation, thus greatly lightening the burden on individual producers. Management and technical proficiency in running the plants is more likely to improve since the authority will be better able to recruit and/or train more competent personnel, and the lines of accountability for these personnel will be fully defined.

To mitigate the problem of transporting coffee cherries, the CAT may wish to fashion a system resembling the one now used by the Tanzania Tea Authority (TTA) in collecting smallholder tea leaves for processing. The TTA has built numerous road-side tea leaves collection depots at which it buys the tea leaves from growers on a well publicized timetable. To adopt such a system, the CAT will need to operate a fleet of trucks to haul the cherries from the collection depots to the CPs. To cut down costs, the authority could operate mobile cherry weighing and bookkeeping teams to serve several depots rather than employ permanent personnel and install fixed equipment at each depot. The problems relating to the size and number of payments to growers (see pp. 30-31) may be solved by the CAT issuing growers with IOUs each time they make delivery of cherries and have these cashed at specified, well-spaced intervals, say two or three times a season.

As mentioned above, many growers own hand-operated pulperies.

The CAT should consider buying these pulperies from growers in areas where CPs are in operation for re-sale to growers in new coffee areas or in areas where CPs are deemed uneconomic or non-feasible. This step will reduce growers' losses in having to abandon the equipment but even more important, will be a check against growers reverting to home pulping. In the same direction, the authority should seriously consider the outlawing of home pulping in areas where CPs are in operation. This form of legislation is in operation in Kenya so the CAT might find it instructive to study Kenya's experience in this respect.

In future appraisals of new CPs, it will be necessary to thoroughly and realistically review and coordinate the production expansion potentials and plant capacity as well as the accompanying facilities, including those of drying and storage. It will be necessary to take full account of the adequacy of water supply and plant location relative to the area to be served and the road network connecting the plant to the overall area. In this connection, it is worth noting that both the CIP and CEP have access roads improvement components.

We should also underscore the need for propaganda and education to growers as to the need, economies and advantages of central pulping compared to the traditional home pulping. These advantages include the saving of time and effort otherwise required for home processing, savings on the costs of home pulping, drying and storing equipment and facilities, as well the gains from the increase in the value of the crop resulting from improved quality and uniformity.

Marketing Policies: Export

Most of Tanzania's mild coffee is sold ex-warehouse Moshi at weekly auctions held at Moshi. A very small proportion is sold by private deals between the CAT and buyers. These auctions have traditionally been attended by a large number of private dealers, mostly foreign, and since the 1963/64 coffee year, the country's public sector has actively participated in these auctions. In recent years GAPEX, a state corporation, tops the list in purchases of mild coffee while CAT's export department leads in hard coffee purchases.

Theoretically, a well-attended, well-participated-in auction presents a setting for obtaining good prices during a given sale. However, as we have mentioned, the method is by no means foolproof -- it is still vulnerable to manipulation through collusion. A shortcoming of this method of selling that is even more serious in light of our production policy recommendations has to do with the fact that the method has no way of guaranteeing that a given volume of coffee will be bought during a given period of time. We have recommended that Tanzania adopt a coffee expansion policy in the face of a real possibility of tough export market competition from other producing countries which are pursuing similar policies. In this situation, what Tanzania should strive to achieve in her export marketing efforts is guaranteed market outlets even if such guarantees will have to entail short-term price discounts. In other words, Tanzania should seriously seek to establish long-term sales contracts with foreign buyers as an integral part of her market share expansion strategy. It is

important that, in structuring such contracts, enough flexibility be built in to accommodate changing circumstances through, for example, the provision of adequate escape clauses and re-negotiation of the contracts under unforeseen circumstances. As part of the flexibility mechanism, price provisions should be based on moving rather than static reference points. For example, the contract price might be an agreed number of percentage points off the average New York spot price for the type of coffee during the week preceding the date of sale of shipment. Of necessity such provisions will be subject to negotiation, but what we are emphasizing is the need to stay away from fixed absolute prices.

The coffee selling season in Tanzania presently runs from October to about May, at which time the year's crop is sold out. This means that with its present marketing resources, the CAT could sell about one third more coffee than it does at present. However, to be able to cope with the contemplated overall increase in production, the authority will have to expand its marketing capacity considerably. Most important the CAT will have to recruit more imaginative marketing talent as well as develop its present manpower to the level necessary to cope with the anticipated realities of tough competition. To cope with this reality, the authority will have to move away from operating by tradition and convention and base decisions on proper economic rationale, taking full account of changing circumstances and all available options.

Tanzania's present level of export promotion leaves much to be desired. At times initiatives have not been adequately followed up,

thus nullifying any prospects for success. For example, during 1972/73 and 1973/74 the TCB participated in the Ndola (Zambia) International Trade Fair. During these two years, whether by coincidence or by some causal relationship, Tanzania sold to Zambia some 5.9 and 79.4 metric tons of coffee respectively. In 1974/75 and 1975/76 sales to Zambia dropped back to zero. Tanzania has excellent diplomatic and neighborly relations with both Zambia and Mozambique, two of her southern neighbors, and as text Table 43 shows, each of these neighbors has a sizeable coffee market, although, probably due to economic hardships in Zambia and economic as well as political adjustments in Mozambique, both markets have experienced some shrinkage in recent years.

The statistics in text Table 43 indicate a considerable market potential for Tanzania's coffee industry given the cordial relations and the geographical proximity of these countries. However, for Tanzania to realize this potential, it will have to step up promotional activities on a continuous basis rather than the odd participation in a trade fair, establish greater contacts with traders in these countries and especially learn to closely follow up any leads of business interest.

We noted earlier that coffee consumption in the socialist countries of Eastern Europe and Asia is stifled by strict trade and fiscal controls. Again Tanzania has fairly good political and diplomatic rapport with most of these countries. In many cases she already has appreciable trade relations with these countries including as

TABLE 43

MOZAMBIQUE AND ZAMBIA'S GREEN AND ROASTED COFFEE IMPORTS AND TANZANIA'S COFFEE EXPORTS TO THESE COUNTRIES

(metric tons)

	1970	1971	1972	1973	1974	1975	1976
Coffee Imports:							
Mozambique	251	149	200	130	275	157	160[e]
Zambia	286	313	330	404	362	163	200[e]
Tanzania's Coffee Exports to:							
Mozambique	-	-	-	-	-	7.9	51.0
Zambia	-	-	-	5.9	79.4	-	-

Note: e = estimates.

Sources:

i) Mozambique and Zambia, Coffee Imports: FAO Trade Yearbook, 1976, Volume 29, (Rome: FAO, 1976), Table 67, p. 242.

ii) Tanzania's coffee exports: CAT records.

indicated in text Table 44, sizeable, though in most cases unpredictable, volumes of coffee exports.

Tanzania might be able to work through the said controls and thus enlarge her share of these markets by negotiating barter arrangements with these countries in which coffee would be exchanged directly for manufactured goods. We should emphasize, as we have done with respect to other contractual arrangements, that care should be taken in determining the valuation bases for these arrangements, so that the value of whatever is exchanged for coffee is somewhat

TABLE 44

TANZANIA'S COFFEE EXPORTS TO THE SOCIALIST COUNTRIES OF EASTERN EUROPE AND ASIA: 1970-1976

(in metric tons)

	1970	1971	1972	1973	1974	1975	1976
Czechoslovakia	560	480	350	241	-	500	-
China	-	461	-	535	518	-	-
East Germany	160	531	341	1,101	443	400	-
Yugoslavia	-	599	287	999	1,850	-	158
USSR	-	1,050	525	2,073	942	1,006	720
Poland	523	-	-	-	-	-	-
Romania	-	-	1,050	-	-	-	-

Source: Kumbukumbu Juu Ya Zao la Kahawa na Shughuli za Bodi Ya Kahawa Tanganyika, 1976-77, (Moshi, Tanzania: CAT, 1977), Nyongeza II.

comparable to what the value of the volume of coffee could buy elsewhere under conventional trade channels. These arrangements should, in other words, be viewed in their proper perspective, as economic rather than political or diplomatic exploits, with proper consideration being given to all available alternatives.

Tanzania's Negotiating Experience and Policies Relating to the ICA

Judging from her basic quota allocation, Tanzania's performance during the 1962 ICA negotiations was something of a disaster. The country's quota allocation was very low relative to her production

potential. This disparity became abundantly clear when just a year after the agreement came into force, Tanzania found herself exporting proportionately more coffee to the lower priced Annex B (non-quota) markets than the average for the agreement's overall membership. By 1966/67, the year before the 1962 ICA was to end, the ratio of Tanzania's exports to these markets to her total coffee exports was five times higher than the average for the ICA membership (see text Table 45). This situation prompted the chief executive of the TCB to comment that, "in some seasons Tanzania sold as much and more to Annex B countries than did Colombia with an export quota of 5.7 million bags."[25]

Tanzania's inability to obtain a more equitable quota had both domestic and external origins. The most serious setback originated from the UN Coffee Conference's decision to base quota allocations solely on historical export performance, to the utter disappointment of the new coffee producing countries who had lobbied heavily for a quota system that would take count of the production potentials of each member country. On the home front, although apparently much planting had occured particularly in the smallholder sector following the 1950's price hike, the country lacked the appropriate machinery for accumulating statistical data[26] and developing reliable production trends taking into account these new plantings. During this time the smallholder sector accounted for about 75 per cent of the country's total coffee output. The industry at that time was considerably disorganized. The government's control of the Board was rather rudimentary -- the Board was effectively under the control

TABLE 45

COFFEE EXPORTS TO NON-QUOTA MARKETS: TANZANIA VERSUS THE ICA MEMBERSHIP: 1961/62-1971/72

	Tanzania			All ICA Members		
Year	Non-Quota ('000 met. tons)	Total ('000 met. tons)	Percent Non-Quota	Non-Quota ('000 met. tons)	Total ('000 met. tons)	Percent Non-Quota
1961/62	0.4	22.9	1.7	na	na	na
1962/63	1.6	27.2	5.9	100.9	2,861.8	3.5
1963/64	2.4	28.9	8.3	117.2	2,905.8	4.0
1964/65	5.9	30.3	19.5	132.7	2,486.9	5.3
1965/66	11.8	50.4	23.4	252.2	2,987.0	8.4
1966/67	16.4	42.2	38.9	219.4	2,862.3	7.7
1967/68	15.8	45.6	34.6	279.9	3,276.9	8.5
1968/69	15.0	52.0	28.8	275.4	3,211.4	8.6
1969/70	4.2	43.0	9.8	213.3	3,278.8	6.5
1970/71	3.5	39.6	8.8	200.5	3,058.1	6.6
1971/72	3.1	47.9	6.5	na	3,507.6	na

Sources:

(i) 1961/62, 1967/68-1971/72 for Tanzania: Kumbukumbu Juu ya Zao la Kahawa na Shughlui za Bodi ya Kahawa Tanganyika, 1976/77, (Moshi, Tanzania: CAT, 1977), Nyongeza II.

(ii) 1962/63-1966/67: S. Singh, ICA 1968 Background and Analysis, (Washington, D.C.: IBRD, August 1968), Table 5.

(iii) 1967/68-1970/71 Total Exports (All ICA Members): Basic Statistical Information on Supply and Demand During The Period 1962/63 to 1973/74 and Projections up to 1980/81, WP Agreement #23 (E), (London: ICO, January 20, 1975), Table 4.

(iv) 1967/68-1970/71 Non-quota Exports (All ICA Members): Basic Information on: Article 40 of the International Coffee Agreement 1962 and 1968, EB 1083/72 Rev. 1, (London: ICO, July 4, 1972), Table 3.

of the largely foreign owned estate sector,[27] a fact which could not realistically be expected to aid understanding of the smallholder production trends. At the same time it was the government, and judging from the composition of the country's delegation to the UN Coffee Conference, the government alone was directly involved in the agreement's negotiations. This delegation did not have anyone from the Coffee Board and was apparently top heavy -- it was almost exclusively composed of executives and lacked professionals in relevant fields; in short the delegation had too much of the wrong experience for negotiating on behalf of the coffee industry.[28]

We should in addition note that these negotiations took place during Tanzania's (Tanganyika) first year of political independence; a fact which is likely to have contributed to the country's lack of negotiating experience. Closely related to this consideration is the fact that in spite of its inequitable quota allocation, Tanzania decided to join the agreement while Kenya, for example, chose to stay out and prove its production capacity so that later when it decided to join the agreement, it would qualify for a larger quota on account of its superior export performance.[29] This was a very daring move on the part of Kenya since the agreement had provisions which limited the amount that importing members could import from non-members, provisions which could be made even tighter in the future. However, the move eventually paid off -- when Kenya joined the agreement in 1968, its basic quota allocation was over 39 per cent greater than the 1962 ICA quota which she had turned down.[30]

Unlike Tanzania, Kenya could afford to take these risks for at least three closely related reasons. Firstly, at the time of the conclusion of the 1962 ICA, Kenya was still a British colony and as such could count on Britain in the event of major problems. Secondly, at that time about 75 per cent of Kenya's coffee production came from the estate sector[31] which was dominated by British citizens. These two facts served to provide considerable assurance that even from outside the agreement Kenya would find market in Britain and other major markets. Thirdly, the Kenyan economy had a stronger base, and again there was always the possibility of falling back on Britain should the situation prove unmanageable.

Tanzania, on the other hand, had already gained her independence from Britain and as such could not count on the British for much support in the event of hardships. Tanzania's economy was very fragile and largely dependent on the country's export earnings for sustenance. We might note in this regard that before independence, only Tanzania among the British East African territories (including Kenya and Uganda) received budgetary subventions from Britain;[32] a fact which Tanzanians viewed as indicative of Britain's failure or unwillingness to make the country self-supporting like her two neighbors, Kenya and Uganda. As we have already implied, the foreign-controlled estate sector in Tanzania only accounted for about 23 per cent of the country's total coffee output. Clearly then a decision by Tanzania not to join the agreement was bound to be more risky than a similar decision by Kenya. At the same time, considering the country's production organization

(heavily smallholder-dominated), the probability of a dramatic increase in production, even from outside the agreement, appeared limited. Therefore, although it may be argued that by joining the agreement Tanzania gave in to punitive production restrictions, an argument which is itself subject to serious contention in view of the country's noncommital domestic stance on production controls,[33] there is little doubt that this decision was judiciously made, and given the circumstance, it was a sound policy decision.

The benefits of experience in coffee negotiations were demonstrated for Tanzania during the 1968 ICA negotiations. As we mentioned in an earlier chapter, Tanzania came out with a 34.5 per cent quota increase over her 1962 ICA quota allocation, a gain only surpassed by Kenya's. In these negotiations, Tanzania had most of the statistical and other information necessary to argue her case. The negotiation strategies were relatively well-defined and coordinated. The requisite contact and sympathies had been sought and secured in good time for the negotiations.

As we have pointed out earlier, the 1976 ICA is considerably different from previous agreements, thus the specifics of the issues that are likely to come up for negotiations and probably even the manner in which these issues are going to be negotiated are likely to differ somewhat from previous negotiations, so that experience gained from previous ICA negotiations may not be directly applicable to the new situation. Undoubtedly, however, we can draw certain general principles and lessons that are likely to prove of help to future Tanzanian negotiators within this and other agreements.

One cannot overemphasize the need for adequate understanding of the commodity itself and a thorough comprehension of the issues to be negotiated as to how they relate to the agreement's provisions and their implications at the national and international levels. Such a comprehensive understanding calls for elaborate preparation as well as ability and willingness of those responsible to tap experiences and intellect from various related fields. This could be accomplished by including in the negotiating delegations experts on the various fields but since a delegation's size is finite, considerable reliance will have to be placed on preparatory research and analyses as well as briefings and discussions between the negotiators, experts in the related fields and policy makers.

Historically, coffee negotiations have tended to be atomistic, preferring to limit themselves to the exclusive matters of coffee rather than get involved in the broader issues of international trade and/or development negotiations, arguing that these broader issues belong to GATT and UNCTAD, for example. This attitude changed somewhat during the 1976 ICA negotiations. In fact, two of the major issues of contention during these negotiations were to do with indexation and a guaranteed stock for coffee,[33] the very issues that bedevil negotiations within UNCTAD and other international trade and development forums. This development calls for a broadening of delegations' preparation to cover the general issues of international political economy, trade and development.

As we have pointed out in relation to the developmental role of coffee in the Tanzanian national economy and in relation to coffee

diversification, both production and trade in coffee are subjects of concern to the overall development efforts of the national economy and as such must be viewed in the context of the overall national development strategy. The country's coffee negotiators therefore must be well versed with the manner in which coffee fits into the overall national economic and social network, and how the issues to be negotiated and/or specific coffee programs relate to other national development efforts and policies.

In international negotiations, particularly ones that are more developmental than strictly business in nature, each country delegation tries to prove that its case deserves greater sympathy than others. For a country delegation to make a convincing case in these circumstances, it is not enough that the team is well informed about its own national situation, it needs to be aware of other countries' situations as well -- their ongoing and planned programs, their relative reliance on the commodity, problems and successes in implementing programs and the like. This understanding enables the delegation to formulate, argue and canvas support of its case in the broader context of the world situation and particularly in relation to the competing cases of other producing countries.

Closely related to the foregoing discussion is the need for a negotiating team to know the interests of other parties -- both producers and consumers and their various groups. This need is particularly essential for small member countries whose interests can usually only be successfully catered to in the context of the majority of members' interests, a powerful group's interests, or if such interest

is shared by or has the sympathy of some "senior" members of the accord. To be fruitful, therefore, a delegation will need to have the ability of defining and/or wording the statements of its interests so that they are or appear to be complementary with other individual members or group interests. Such complementary interests are not likely to present major problems in defending since they will be the subject of group defense. It is with interests that are unique to a member country or that run counter to a sizeable portion of other members' interests that a delegation's efforts must be doubled to accumulate support or sympathy from producer members who are either not adversely affected by the country's quest or who may some how be convinved to change positions, and from consuming members who are deemed likely to react favorably.

The personal experience and charisma of individual members of a team deserve special consideration. An experienced and charismatic delegation leadership is likely to give the delegation more influence in negotiations than may be implied from the country's voting power, for example. There are two sides to these virtues -- the ability to win over the support of others by one's eloquence, and the knowledge and personal acquaintance of the individual negotiators with negotiators of other countries. Both of these attributes accrue to individuals mainly as a byproduct of repeated participation in the negotiations over an extended period of time. The attributes are particularly important because most of the crucial aspects of negotiations are conducted through person-to-person lobbying rather than in the main conference

is shared by or has the sympathy of some "senior" members of the accord. To be fruitful, therefore, a delegation will need to have the ability of defining and/or wording the statements of its interests so that they are or appear to be complementary with other individual members or group interests. Such complementary interests are not likely to present major problems in defending since they will be the subject of group defense. It is with interests that are unique to a member country or that run counter to a sizeable portion of other members' interests that a delegation's efforts must be doubled to accumulate support or sympathy from producer members who are either not adversely affected by the country's quest or who may some how be convinved to change positions, and from consuming members who are deemed likely to react favorably.

The personal experience and charisma of individual members of a team deserve special consideration. An experienced and charismatic delegation leadership is likely to give the delegation more influence in negotiations than may be implied from the country's voting power, for example. There are two sides to these virtues -- the ability to win over the support of others by one's eloquence, and the knowledge and personal acquaintance of the individual negotiators with negotiators of other countries. Both of these attributes accrue to individuals mainly as a byproduct of repeated participation in the negotiations over an extended period of time. The attributes are particularly important because most of the crucial aspects of negotiations are conducted through person-to-person lobbying rather than in the main conference

halls of committee rooms. This points to the importance of individual members' continued participation in negotiating teams. Important as this argument is, it can be easily overdrawn or abused and result in negotiations being a one-man show. This danger particularly looms in the case of countries like Tanzania in which, as a consequence of budgetary or manpower limitations, delegation size has to be cut down to a minimum. There is need, in other words, to properly balance this quest for long-term experience and the desire to develop new negotiating talent with the inclusion in the delegations of individuals with critically needed talents and experiences for specific issues on the agenda for negotiations.

Finally, we should underscore the fact that, while capable and experienced negotiators are an important asset to a delegation, the backbone of most negotiating teams and the main determinant of the chance for success in negotiations is the research and analytical talent that backs up the negotiations. We have outlined in the foregoing paragraphs the kinds of preparation and background information that a negotiating team will require if it is to be effective in its mission. However, neither the CAT nor the Ministry of Agriculture, which oversees the coffee industry, has the necessary pool of talent to furnish all the material required for such comprehensive preparation of negotiating teams. In view of this, therefore, we wish to put forward two recommendations:

(i) That the Ministry of Agriculture, in collaboration with the CAT and other commodities authorities, establish a specialized research/study team of specialists to:

a) follow up world level developments, including markets and production trends, of commodities most important to the country's economy;

b) accumulate statistical data and other information relating to international collaboration in these commodities; and

c) furnish the necessary negotiating and commodities policy background research and analyses and backup to commodities negotiating teams, and on a broader scale, provide essential basic information for overall commodities policy development.

(ii) That the Ministry of Agriculture, the various commodities authorities and especially the team recommended in (i), work closely with pockets of specialized expertise, especially the University of Dar-es-Salaam, in order to exploit existing talents and experience by involving these specialists, on a regular basis, in discussions of commodities policy issues and strategies. This way, policy makers and commodities trade negotiators will be able to most effectively gain from talents and intellectual resources existing in the country.

FOOTNOTES

1. L. L. Rutahakana, J. A. Rweyemamu, and W. C. M. Maxwell, An Analysis of the Tanzania Coffee Industry and a proposed National Coffee Improvement Plan 1975-1980, Volume 1, (Moshi, Tanzania: TCB, January 4, 1975).

2. CAT, Coffee Expansion Programme, 1978-1982, Volume 1, Program Analysis, (Moshi, Tanzania: CAT, February 1978), pp. 13-14.

3. Ibid., pp. 22-23.

4. The GS Comptroller General, op. cit., p. 76.

5. J. E. D. Robinson, A Handbook on Arabica Coffee in Tanganyika, (Moshi, Tanzania: TCB, 1964), cited in Rweyemamu, op. cit.

6. Rutahakana, Rweyemamu, Maxwell, op. cit., p. 18.

7. Ibid.

8. Ibid., Table 17, p. 40.

9. MDB, op. cit., Table 3.5, p. 16.

10. CAT/MDB, Proposals for a National Coffee Expansion Programme, Volume 1, MDB R4/77, (Dar-es-Salaam: MDB, Ministry of Agriculture, June 1977), p. 26.

11. Rutahakana, Rweyemamu, Maxwell, op. cit.

12. Joseph K. Maitha, "A Supply Function for Kenya Coffee", East African Economic Review, Vol. I, #1, June, 1969 and Vol. 2, #2, 1970.

13. Rutahakana, Rweyemamu, Maxwell, op. cit.

14. Tanzania's Coffee Export Tax proceeds and government Coffee Berry Disease (CBD) control subsidy, 1972/73 - 1975/76: (in million Shillings).

	Coffee Export Tax Proceeds	Government CBD Control Subsidy	Subsidy as % Proceeds
1972/73	57.9	16	28
1973/74	115.3	30	26
1974/75	48.3	30	62
1975/76	104.8	30	29

Source: Financial Statement and Revenue Estimates, (Dar-es-Salaam: Government Printer, several issues).

15. Author's interview with E.A. Kyendesya, General Manager, Tanganyika Coffee Curing Company, Moshi, February 27, 1978.

16. The Mild Coffe Trade Association of East Africa, Report to the Tanganyika Coffee Board, (Nairobi: The Mild Coffee Trade Association of East Africa, undated mimeo - probably written mid 1972), pp. 1-2.

17. J. M. Mdadila, "The Problems of Demand and Supply of Tanzania Coffee", (paper submitted in partial fulfillment of the Post-graduate Diploma in Agricultural Economics, Reading University, 1974), (Mimeographed).

18. Author's interview with S. P. Muro, General Manager, General Agricultural Products Export Corporation, Dar-es-Salaam, February 6, 1978.

19. It is believed that dealers comspired to buy Tanzanian coffee at low prices, rail it to Mombasa, rebag the high quality portion of it and export it as Kenyan top quality/premium priced Kenyan coffee. This allegation is not utterly bizarre - D. N. M. Bryceson, a former Minister of Agriculture in Tanzania, recalled (during an interview with the author) a case in which a dealer was caught red-handed rebagging Burundi coffee (which is of a quality inferior to Tanzania's Arabicas) in Tanzanian Arabica bags for export as Tanzania coffee.

20. S. M. Mbilinyi, "The Economics of Central Coffee Pulperies in Tanzania: A Preliminary Assessment", Economic Research Bureau, University of Dar-es-Salaam, ERB Paper 68.6, February 1968. p. 1, (Mimeographed).

21. For ease of recouping CP loan funds from growers' coffee deliveries, as well as ensure satisfactory CP capacity utilization, it was the general practice that CPs only accepted cherries from their own cooperative society members. This practice was aimed at avoiding a situation where grcwers escape CP loan repayments in their primary cooperatives by delivering their coffee cherries to other CPs.

22. Ibid., p. 5. In the Arusha area a pound of parchment coffee fetches about one shilling (about 13¢) while that of cherries fetches only 20 cents (about 3¢). It takes 5 pounds of cherries to yield a pound of parchment.

23. Rutahakana, Rweyemamu, Maxwell, op. cit., p. 30.

24. Mbilinyi, op. cit., p. 12.

25. Paton's Complete Coffee Coverage, November 17, 1969, citing Mr. L. L. Rutahakana, Executive Officer of the TCB, now General Manager of the CAT.

26. Address by O. A. Makule, Chairman of the TCB to the ICO Executive Director, Alexandre F. Beltrao in Moshi, May 3, 1972.

27. Author's interview with J. J. Mungai, General Manager, Sugar Development Cooperation, former Minister of Agriculture, Dar-es-Salaam, March 21, 1978.

28. Tanzania's delegation to the 1962 UN Coffee Conference, New York, was made up of: D. N. M. Bryceson, Minister of Agriculture; A. Z. N. Swai, Ambassador; A. P. S. Forbes, Permanent Secretary, Ministry of Agriculture; G. M. Rugarabamu, Official, Ministry of Agriculture; [illegible]. Ngaiza, Councilor, UN Mission; J. Malecela, Secretary, UN Mission; W. Ramsey, Advisor, UN Mission.

29. London, interview, op. cit.

30. Singh, ICA 1968, Table 6.

31. FAO, World Coffee Survey, (Rome: FAO, 1968), Table 48.

32 Rourk, op. cit., p. 21, notes that unlike some other African countries, the Tanzania government at no time prohibited new plantings of coffee. Rather it attempted to prevent excessive increase in production by presenting growers with attractive production alternatives. We should add that this was the official policy inspite of lip-service given to active production controls in official publications.

33. Authors' interview with P. Knox, Secretariat Officer, ICO, London, July 24, 1978.

CHAPTER VI

SUMMARY AND CONCLUSIONS

We set out to develop policy recommendations relating to the production and marketing of Tanzanian coffee, with a view to enhancing the predictability, real value and purchasing power of the country's foreign exchange earnings. We noted in the introduction that these gains are functions of production and marketing decisions made within as well as outside the Tanzanian economy, and certain phenomenal occurrences both within and outside the country's geographical boundaries.

The Tanzanian coffee industry, we have seen (pp. 18-19), employs about a quarter of a million people and provides economic livelihood for about 10 per cent of the nation. At the same time the commodity contributed 3.6 to 7.1 per cent of the country's total tax revenue, the equivalent of 2.9 to 5.7 per cent of the annual recurrent revenue during 1970-75 (text Table 5). This contribution was made by way of a coffee export tax, corporate income taxes and taxes paid by those who earn income from coffee. Between 1970 and 1976, export earnings from coffee accounted for between 11.7 and 31.5 per cent of the country's foreign exchange earnings (text Table 6).

Needless to say, a part of the foreign exchange earnings from coffee goes to meet the country's investment goods imports bill, thus contributing to investment resources. Investments in coffee-related industries add to the country's stock of capital and so do the housing and coffee processing equipment expenditures by growers. In addition,

coffee incomes are used to run private businesses as well as finance human capital development via education, nutrition and health care, for example. In aggregate, we noted that coffee contributed 5.4 to 8.4 and 7.8 to 11.8 per cent of total and monetary GDP between 1970 and 1976 (text Table 8).

Our literature review has largely confirmed LDCs' concern over excessive fluctuations and sluggish growth in their primary export markets. We have seen that, except for the 1950's, generally export prices, volumes and earnings have tended to be more unstable for the poor than for the rich countries (pp. 37-40). We have noted that generally the ultimate goal of stabilization is the value of exports rather than either export prices or quantities, because earnings' instability is more closely associated with economic growth than export prices or volumes instability (p. 48). Whereas many authors, among them Isaiah Frank (footnote 1) and G. K. Helleiner (footnote 8), whose works we have cited extensively, believe that export instability is harmful to economic growth, expecially where such instability is experienced in economies characterized by low growth rates, they generally agree that sluggish trends in these earnings are more detrimental to growth than their instability. Unfortunately, with the exception of only a few countries, commodities and periods of time, most LDCs experience low economic growth rates, and the terms of trade of their primary commodity exports have tended to fall relative to their manufactured imports from the DCs. At the same time the productivity of these LDC primary export commodities has not risen sufficiently to compensate for

their per unit loss of power to purchase manufactured imports whose prices have continued to rise unabated. Where productivity or production has increased considerably, low price elasticities of demand, trade barriers and competition from synthetic and natural substitutes produced in the developed countries, usually behind high tariff walls, cause the volume of trade in these commodities to increase only sluggishly (pp. 48-55).

We have also noted in Chapter II that, mainly as a consequence of the time lag between coffee production decisions and their outcomes, the production cost structure as well as the dominance and destabilizing nature of Brazilian coffee production, a free market for coffee is not likely to result in stable and rising trends in the export earnings of the producing countries (p. 68). It has been shown that if a commodity's supply and demand are sufficiently price-inelastic, price stabilization may improve both stability and size of earnings (pp. 43-48). The world coffee market has been shown to exhibit low price elasticities of supply and demand, with a fairly concentrated pattern of production and centralized system of marketing in most exporting countries, all of which conditions make coffee particularly suited to price stabilization through an international commodity agreement.

The ICA had as its ultimate objective the stabilization of coffee producing countries' real value of export earnings along a progressively rising trend. However, between 1964 and 1972, during which period of time the agreement's economic controls were in full force, the agreement's performance relative to this ultimate objective

can at best be said to have been modest. This subdued success is mainly a consequence of intervening factors, including increased frequency and severity of frosts in Brazil, international monetary instability and political adjustments in major producing countries.

Our empirical analyses in Chapter III have shown that during 1964-72, the trend of Tanzania's real earnings from coffee exports exhibited a positive though statistically insignificant slope. The rate of change in this slope was negative. At the same time, both proxies of the country's coffee export price used in the analysis, Pta and Pxa, tended downwards with the slope being statistically significant for Pta and insignificant for Pxa. The country's volume of coffee exports, Qx, on the other hand, tended upwards during this period, although the slope was statistically insignificant (pp. 107-110). According to these results, it is apparent that these trends combined with a growing rate of inflation to result in a general loss of the country's power to purchase imported capital goods (pp. 114-120).

The analysis also showed that the real value of the country's coffee export earnings were more unstable during the active operation of the ICA's control mechanisms, 1964-72, than before their operation, 1955-63. Both Pta and Pxa were more stable during the 1964-72 period than during 1955-63. The country's volume of coffee exports was shown to have been less stable during 1964-72 than before (pp. 121-123).

These results lead to two major conclusions. Firstly, that both with respect to trends and stability, the country's real value of export earnings from coffee is more responsive to changes in the

country's volume of coffee exports than to export prices. Secondly, that the ICA's resolve to help coffee exporting countries realize progressively increasing and more stable export earnings has not been realized in the case of Tanzania. The agreement does not appear to offer much hope for the future either, since even with the 1976 ICA, the main control mechanisms remain the same as those employed by the 1962 and 1968 ICAs -- price goals and supply restrictions (i.e., export quotas).

These conclusions have far-reaching implications for Tanzania's future policies relating to her relationship with the ICA. In the first place, it means that the country cannot rely on the agreement for increased stability, earnings and purchasing power of her coffee export proceeds. Secondly, her future efforts towards attaining these goals, whether in respect of her domestic policies or participation in the ICA, will have to focus on her volume of exports rather than export prices.

We have pointed out in Chapter IV that both the 1962 and 1968 ICAs were excessively rigid and incapable of adjusting to changing market conditions, and had many loopholes that enabled too many members to evade their obligations under the agreement (pp.129-140). The 1976 ICA, on the other hand, is more versatile -- it came into force with inactive quotas which are set to come into effect automatically when the market prices fall to stipulated levels; the country shares of the market (export quotas) are based on more up-to-date export performance data and verified levels of stocks; provides for consideration of world

inflation and monetary trends in setting price objectives; and does not impose production controls but is more strict on export quota violations. We have argued that these flexibility mechanisms allow low cost producing countries to increase their market shares without violating the agreement's provisions (pp. 140-147).

We have also seen in Chapter IV that Brazil's share of the world coffee market has been declining as a consequence of increased frequency, expanse, and severity of frosts and increasing costs of recovery from these frosts, as well as increasing the costs of fertilizers and chemicals for disease and pest control. The general level and rate of economic development and successful economic diversification in that country make available an ever increasing number of investment alternatives that are more attractive and less risky for both private and public resources, thus tending to draw resources away from coffee (pp. 149-154). Future weather trends, we have seen, point to greater variability and with this, increased uncertainty for producers providing further incentive in Brazil and other countries where attractive alternative opportunities are available, for directing resources away from coffee (pp. 166-168).

Production in the rest of Latin America is holding steady and several countries have major production expansion programs, mostly geared to increasing yields by use of costly, high technology-intensive techniques. These techniques include heavy application of fertilizers and strict disease and pest control regimes, breeding for and planting of varieties that yield more per plant and/or allow for

increased plant population per hectare and thus increase total yields. The high costs of technology involved combine with the relatively high costs of labor in these countries to make this anticipated increase in production very costly (pp. 154-158). We noted that production in Africa and the share of the market commanded by African producing countries have been increasing. However, a dramatic increase in production in the near future is constrained by political instability as well as shortages of labor, finances and know-how at the plantation scale and the long gestation period at the smallholder scale (pp. 158-166).

The world's consumption of coffe continues to increase but at a decreasing rate, although there are major differences in these trends between countries and amongst types and forms of coffee consumed. In the United States consumption is declining in absolute terms, but considerable reallocation of market shares in favor of the mild coffees (Arabicas) is apparent (pp. 171-176). The Northwestern European countries remain sold on mild coffees and consumption continues to increase in absolute terms. In the other major markets, overall demand is also increasing. Consumption of soluble coffee, a form of coffee that requires a larger quantity of green beans per cup than regular coffee, has picked up particularly well in some non-traditional coffee drinking countries, such as Japan and Britain, as well as some well established markets and in certain markets in which overall consumption is slackening, thus tending to mitigate any overall decline in demand for green coffee (pp. 176-188). We concluded from these analyses and

review that there is room in the market and it is feasible for Tanzania to increase her market share if she employs appropriate organizational, and technological levels and imaginative marketing strategies.

Tanzania's Coffee Improvement and Coffee Expansion programs aim at nearly doubling the country's coffee production by the early 1980's. The experimental data we have cited (pp. 206-216) lead to the conclusion that this objective is technically feasible.

Our discussion in Chapter V has spelled out a number of policy implications relating to production, marketing and participation in the ICA: policies which are geared to enable Tanzania to achieve increased production, competitiveness in the market place and thus improve her gains from trade in coffee.

Production Policy Recommendations

(1) Tanzania's efforts to increase yields should for the time being, concentrate on protection against pests and diseases and cultural practices in preference to heavy fertilizer applications and/or engaging in sophisticated research/breeding programs in search of high yielding planting materials, because the former have a shorter gestation period and the net returns are more certain (pp. 206-216).

(2) There is need for Tanzania to re-examine the relative merits of increasing production of Robusta and Arabica coffees, in view of the relative market trends, costs of production, and disease and pest controls (pp. 212-213, 221-224).

(3) Production expansion should be carried out preferably on the smallholder and ujmaa village scale rather than conventional

estates, in view of Tanzania's limited supply of estate managerial experience, higher costs of production on the estate scale and to enhance income distribution in the country (pp. 218-221).

(4) Tanzania should reappraise the relative merits of applying resources to quality versus volume of production, considering the production costs, quality price premia and the total size of export earnings (pp. 221-224).

(5) New expansion programs should be carried out with a view to decentralizing production from the present high income/high production costs/high disease and pest-infested areas to lower income/lower production costs/lower disease and pest-infested areas. This strategy also provides a good hedge against increased weather unpredictability (pp. 224-226).

Marketing Policy Recommendations

(1) Tanzania should initiate a program of preseason guaranteed producers' price announcements complemented by a price stabilization fund as a way of fostering increased production and quality improvement.

(2) Tanzania's efforts to check illegal coffee trafficking between herself and the neighboring countries should concentrate on stricter border surveillance in preference to producer price rationalization between countries, because the primary motive behind this practice appears to be the potential profits to be made from using the foreign money thus obtained to import and sell goods available in the other countries but that are in short supply in the country of origin of the coffee thus moved rather than the price paid to producers

(pp. 231-233).

(3) Tanzania should operate a system of stocks management as a marketing strategy, i.e., withholding coffee when world market prices are below a certain minimum (pp. 234-235).

(4) Future construction of storage capacity should be properly coordinated with production trends and be specifically designed and part designated for long-term (stocks management) storage and part for transitory storage. The latter should be so designed as to be usable for other commodities when coffee stocks are low (pp. 235-236).

(5) Central pulperies should be revitalized and expanded as a means of improving qulaity and uniformity, and all central pulperies serving smallholders should be brought under the ownership and management of the Coffee Authority of Tanzania for more coordinated management and operational efficiency (pp. 237-242).

(6) Along with the central pulperies' revitalization and expansion, the CAT should construct and operate roadside coffee cherries collection depots and run fleets of trucks to transport cherries from the depots to the central pulperies (pp. 241-243).

(7) Also as part of the central pulperies revitalization program, the CAT should issue growers with IOUs on delivery of cherries and these IOUs should be exchangeable for cash two or three times a season for each grower (p. 242). This would increase the size of individual cash receipts and thus make it easier for producers to use their coffee receipts for longer-term investments rather than short-term consumption expenditures (p. 242).

(8) The CAT should couple the central pulpery revitalization

scheme with a propaganda campaign explaining the advantages of using central pulperies as compared to home pulping. Consideration should be given to outlawing home pulping altogether where central pulperies are in operation (p. 243).

(9) Tanzania should seek to establish long-term sales contracts with buyers in addition to the present auction selling practice (pp. 244-245).

(10) The CAT should recruit and/or train more imaginative marketing talent to handle the anticipated tough competition (p. 245).

(11) The CAT should step up sales promotion, especially in net coffee importing neighboring countries and closely follow up leads of business interests in potential customers (pp. 245-246).

(12) Tanzania should seek to negotiate barter arrangements for exchange of coffee with manufactured goods from the socialist countries of Eastern Europe and Asia (pp. 246-248).

Policy Recommendations Relating to the ICA

Tanzania's quota allocation for the 1962 ICA was inadequate due in part to the country's lack of negotiating experience, poor organization of the industry and inadequate knowledge of production trends in the country, especially with regard to the smallholder sector. We wish to recommend first that Tanzania continue to participate in the ICA in order to retain a guaranteed market share and be able to participate in the ICA's decisions relating to prices in a way that is commensurate with the country's central concern for increased volume of exports.

For effective participation in ICA negotiations, Tanzania's negotiators will need to be prepared in the following areas:

(1) Thorough understanding of the commodity, the issues to be negotiated as well as the way the issues relate to the agreement's provisions and their national and international implications.

(2) Familiarity with the broader issues of international trade and development that are related to the issues under negotiation.

(3) Negotiators need to be familiar with the overall national economy and development programs and strategy, and how coffee fits into this strategy.

(4) Adequate understanding of the importance of coffee in other producing countries, their production programs, as well as successes and failures in such programs.

(5) Adequate understanding of other producers' as well as consumers' interests that are relevant to the issues under negotiations, whether these interests are directly to do with coffee or other wise.

(6) In composing negotiating teams, consideration should be given to the candidates' diplomatic and bargaining skills, eloquence, experience and acquaintance with the issues to be negotiated, and personalities in other countries' negotiating teams as well as the desire to develop new negotiating talent (pp. 254-257).

To improve the country's gains from trade in coffee and enhance negotiating ability:

(1) The Ministry of Agriculture, in collaboration with the CAT and other specialized commodities authorities, should establish a

specialized commodities research and study team to:

- keep abreast of international developments in production and markets for the commodities most important to the Tanzanian economy;
- accumulate and analyze statistics and information relating to international collaboration in the respective commodities; and
- furnish commodities negotiations and policy background and supportive research and analyses.

(2) The Ministry of Agriculture and specialized commodities authorities should seek to involve the University of Dar-es-Salaam and other pockets of specialized expertise in the country in discussing commodities policy and negotiation issues. This will facilitate the maximization of the use of Tanzania's limited trained manpower for policy making and negotiation purposes.

APPENDIX TABLES

TABLE 1

TANZANIA COFFEE PRODUCTION - 1936-1976

(Thousand metric tons)

Year	Robusta	Arabica	Total	Year	Robusta	Arabica	Total
1936	16.8	2.0	18.8	1956	7.1	12.1	19.2
1937	11.0	1.2	12.2	1957	11.8	10.0	21.8
1938	12.2	1.8	14.0	1958	12.2	10.3	22.5
1939	11.6	2.7	14.3	1959	10.1	12.9	23.0
1940	13.0	3.8	16.8	1960	10.7	14.2	24.9
1941	10.9	5.0	15.9	1961	9.4	19.1	28.5
1942	9.7	4.2	13.9	1962	9.8	19.2	29.0
1943	10.3	4.8	15.1	1963	7.2	21.5	28.7
1944	7.5	3.7	11.2	1964	7.0	26.3	35.8
1945	10.2	5.4	15.6	1965	8.0	24.2	32.2
1946	9.3	5.3	14.6	1966	10.6	41.4	52.0
1947	7.5	5.2	10.2	1967	8.8	35.8	44.6
1948	7.8	5.2	13.0	1968	10.8	35.4	46.2
1949	12.2	3.8	16.0	1969	9.7	42.9	52.6
1950	7.7	5.8	13.5	1970	12.4	32.2	44.6
1951	11.7	6.6	18.3	1971	10.1	36.7	46.8
1952	9.8	8.0	17.8	1972	9.9	42.6	52.5
1953	12.3	4.4	16.7	1973	10.1	37.4	47.5
1954	5.8	9.6	15.4	1974	11.5	30.8	42.3
1955	11.2	8.6	19.8	1975	8.8	43.3	52.1
				1976	10.8	44.6	55.4

Source: Coffee Authority of Tanzania Records.

TABLE 2

TANZANIA COFFEE PRODUCTION[a] BY REGIONS

(Metric Tons - Clean Coffee Equivalent)

	North Eastern Zone				North Western Zone			Southern Zone			Other Areas					TOTALS[c]		
Year	Arusha Region MA	Kilimanjaro Region MA	Tanga Region HA	Tanga Region R	West Lake Region R	West Lake Region HA	Mara/Mwanza Region HA	Iringa Region MA	Mbeya Region MA	Ruvuma Region MA	Kigoma Region MA	Morogoro Region HA	Morogoro Region R	[b] MA	[b] R	R	MA	HA
1963	1,161	5,989	..	561	6,659	1,511	-	56	2,606	1,805	14	-	-	8,280	21	7,241	19,911	1,511
1964	1,659	11,122	70	461	6,501	2,218	250	71	1,798	1,729	21	-	-	9,853	9	6,971	26,323	2,468
1965	1,418	10,232	179	204	7,685	1,815	93	85	1,743	1,001	11	-	-	7,765	12	7,901	22,434	1,908
1966	1,968	16,710	593	313	10,019	3,779	254	122	3,422	1,960	95	98	-	12,618	9	10,341	37,488	4,131
1967	2,027	14,815	310	180	8,057	2,437	448	79	3,210	1,637	65	80	100	11,162	6	8,343	33,305	2,965
1968	2,371	12,746	882	200	10,044	4,310	524	122	2,855	2,298	70	223	46	9,528	7	10,297	30,872	5,057
1969	2,558	16,087	405	287	9,065	3,080	300	85	3,497	3,065	53	107	70	13,996	8	9,430	39,746	3,487
1970	1,648	10,761	372	100	11,807	3,075	312	75	2,902	2,029	47	113	174	11,164	4	12,085	29,001	3,500
1971	2,496	13,087	266	200	9,808	1,958	339	148	4,120	2,610	22	287	83	11,349	3	10,094	34,098	2,584
1972	3,879	17,510	872	10	9,406	3,090	314	91	4,085	2,039	18	172	127	10,813	-	9,543	39,307	3,576
1973	3,461	14,133	737	80	9,960	1,731	310	98	3,143	2,174	73	301	93	11,223	-	10,133	35,042	2,342
1974	2,116	11,483	454	200	11,267	3,070	208	68	3,397	3,046	82	84	76	6,794	-	11,543	27,450	3,362
1975	3,938	22,320	885	90	8,615	3,193	266	91	3,889	3,121	39	481	127	5,027	-	8,832	39,310	3,940
1976	4,396	22,764	454	12	10,543	2,042	427	106	5,091	3,250	18	251	237	5,768	-	10,792	41,847	2,720
1977	5,327	19,409	763	5	10,829	2,082	171	36	2,823	2,297	17	171	161	4,590	-	10,995	35,262	2,425

Notes: a = Deliveries to coffee curing works (for Mild Arabica Coffee) and Port Warehouses (for Hard Arabica and Robusta Coffees)
b = Most estate coffee which is marketed through the Tanganyika Coffee Growers' Association (TCGA) is produced in the North Eastern Zone
c = Totals do not exactly add up
MA = Mild Arabica
HA = Hard Arabica
R = Robusta

Source: CAT, Coffee Expansion Programme, 1978-1982, Vol. 1, (Moshi, Tanzania: Coffee Authority of Tanzania, February 1978), Table 2.

TABLE 3

COFFEE: SHARE OF GAPEX'S INCOME TAX PAYMENTS

	1974	1975	1976	1977
GAPEX's total turnover ($ mn.)	35.5	35.6	43.3	95.6
GAPEX turnover from coffee ($ mn.)	10.5	7.7	23.[illegible]	68.4
GAPEX's turnover from coffee as percentage of total turnover (%)	29.6	21.6	5[illegible]	71.5
GAPEX's income tax payment ($ mn.)	1.6	1.0	1.[illegible]	1.6[a]
Coffee share of GAPEX's income tax payment ($ mn.)	0.5	0.2	0.7	1.1

Note: a = provisional

Source: General Agricultural Products Export Corporation (GAPEX) records.

TABLE 4

MINOR TCB/CAT CONTRIBUTIONS TO FISCAL RESOURCES

(In Thousand Dollars)

Year	Income Tax	Development Levy	Coffee Levy and TCB Charges	Total
1964	13.6	-	1,349.5	1,363.1
1965	11.6	134.2	1,118.7	1,264.5
1966	na	1,201.0	1,848.7	3,049.7
1967	na	-	1,803.0	1,803.0
1968	na	-	1,793.6	1,793.6
1969	2.2	-	1,595.8	1,598.0
1970	2.5	-	1,506.5	1,509.0
1971	3.1	-	1,462.1	1,465.2
1972	4.4	-	1,425.8	1,430.2
1973	4.5	-	2,132.8	2,137.3
1974	6.4	-	1,104.1	1,110.5
1975	4.3	-	1,329.4	1,333.7
1976	7.2	-	962.5	969.7

Notes: na = Not available.
— = nil.

Source: TCB/CAT records.

TABLE 5

COFFEE: CONTRIBUTION TO GOVERNMENT REVENUE

	1970	1971	1972	1973	1974	1975
Indirect Contribution:						
1. GDP (monetary) ($ mn.)	820.4	882.7	994.8	1,159.0	1,428.7	1,582.8
2. Total Income Tax Receipts ($ mn.)	49.3	62.7	74.5	84.2	97.6	135.9
3. Total Sales Tax Receipts ($ mn.)	27.4	30.5	35.1[e]	63.2	103.1	154.0
4. Total Transfer Tax Receipts ($ mn.)	1.3	0.8	1.0	0.9	0.8	0.2
5. Total Customs and Excise Duties Receipts ($ mn.)	72.5	77.7	79.8	91.9	103.1	106.9
6. Total Coffee Growers' Receipts ($ mn.)	36.1	36.9	40.8	50.1	35.1	42.5
7. Estate Producers Coffee Receipts ($ mn.)	6.8	10.3	10.1	79.1	39.4	5.8
8. Income Tax as % of GDP (%)	6.0	7.1	7.5	7.3	6.8	8.6
9. Coffee Growers' Receipts as % of GDP (%)	4.4	4.2	4.1	4.3	2.5	2.7
10. Estates share of income tax (7 x 8) ($ mn.)	0.4	0.7	0.8	1.3	0.8	0.5
11. Coffee Share of Sales Taxes (3 x 9) ($ mn.)	1.2	1.3	1.4	2.7	2.6	4.2
12. Coffee share of customs and excise (5 x 9) ($ mn.)	3.2	3.3	3.3	3.9	3.0	2.9
13. Coffee share of Transfer Tax (4 x 9) ($ mn.)	0.1	ne	ne	ne	ne	ne
Direct Contributions:						
14. Coffee Export Tax Receipts ($ mn.)	2.8	4.1	3.2	8.1	16.1	6.5
15. Other TCB/CAT Contributions ($ mn.)	1.5	1.5	1.4	2.1	1.1	1.3
16. Coffee share of GAPEX's income tax payments	-	-	-	-	0.5	0.2
Total of the Direct and Indirect Coffee Contributions ($ mn.)	9.2	10.9	10.1	18.1	24.1	15.6
Total Government Recurrent Revenue[a] ($ mn.)	222.3	237.1	261.7	332.0	424.3	533.5
Total Government Tax Revenue[a] ($ mn.)	166.6	192.5	201.7	253.8	352.7	427.6
Total Coffee Contribution as % of Recurrent Revenue (%)	4.1	4.6	3.9	5.6	5.7	2.9
Total Coffee Contribution as % of Tax Revenue (%)	5.6	5.7	5.0	7.1	6.8	3.6

Notes: e = Estimates
a = Includes TCB charges and coffee levy
ne = Negligible
- = Nil

Sources: (i) TCB, Annual Report, (Moshi, Tanzania: TCB/CAT, Several).
(ii) Tanzania Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977-78, (Dar-es-Salasm: Government Printer, 1978).
(iii) General Agricultural Products Export Corporation (GAPEX) records.

TABLE 6

CONTRIBUTION OF COFFEE TO INVESTIBLE SURPLUSES

	1970	1971	1972	1973	1974	1975
Investible surpluses share in the National Income:						
1. GDP (Purchasers' value)[a] ($ mn.)	1,284.2	1,371.6	1,577.8	1,872.1	2,218.8	2,506.5
2. Final consumption expenditure (private and government) ($ mn.)	1,064.5	1.135.0	1,321.3	1,585.3	2,002.4	2,277.9
3. Percentage of GDP not for final consumption (%)	17.1	17.2	16.3	15.3	9.8	9.1
Coffee contribution to investible surpluses in the government sector:						
4. Total coffee contribution to government revenue ($ mn.)	9.2	10.9	10.1	18.1	24.1	15.6
5. Contribution not for final consumption (4 x 3)($ mn.)	1.6	1.9	1.6	2.8	2.4	1.4
Coffee contribution to investible surpluses in the producers' sector:						
6. Growers' coffee receipts ($ mn.)	36.1	36.9	40.8	50.9	35.1	42.5
7. Contribution not for final consumption (6 x 3) ($ mn.)	6.2	6.3	6.7	7.8	3.4	3.9
Coffee contribution to investible surpluses in the foreign sector:						
8. Total value of imports ($ mn.)	318.4	381.6	403.0	495.5	736.2	768.1
9. Value of imported non-final consumption goods ($ mn.)	222.9	284.9	287.1	345.0	464.0	527.1
10. Non-final consumption goods as % of imported goods (%)	70.0	74.7	71.2	69.6	63.0	68.6
11. Coffee Export Earning (R mn.)	43.7	31.8	53.6	70.5	52.5	65.2
12. Coffee Export Earning contribution to non-final consumption goods (11 x 10) ($ mn.)	30.6	23.8	38.2	49.1	33.1	44.7
Total Coffee contribution to investible surpluses (5+7+12) ($ mn.)	38.4	32.0	46.5	59.7	38.9	50.0

Note: a = GDP (purchasers' value) differs from GDP (factor-costs) used elsewhere by the inclusion of indirect taxes net of subsidies in the earlier.

Sources:
(i) Tanzania Government, Hali ya Uchumi wa Taifa Katika Mwaka 1977/78, (Dar-es-Salaam: Government Printer, 1978).
(ii) United Nations, Yearbook of National Income Account's Statistics, Vol. II, (New York: United Nations, 1976).
(iii) TCB, Annual Report, (Moshi, Tanzania: TCB/CAT, several issues).

TABLE 7

TANZANIA COFFEE EXPORT EARNINGS (Vxa), VOLUME (Qx), AND UNIT VALUE (Pxa)

Year	Coffee Export Earnings[a] (Sh. mn. Current)	Vx[b] ($ mn. Current)	Vxa[c] ($ mn. Const.)	Qx[d] (1000 metric tons)	Pxa[e] (Constant 1963 ¢/lb.)
1949	29	5.8	6.8	14.8	20.85
1950	69	9.7	11.8	16.3	32.85
1951	90	12.6	13.0	18.3	32.23
1952	111	15.5	15.7	15.0	47.49
1953	116	16.2	17.5	19.0	41.79
1954	200	28.0	30.4	18.2	75.79
1955	138	19.3	20.8	21.3	44.31
1956	185	25.9	27.0	18.2	67.31
1957	143	20.0	20.2	21.9	41.85
1958	152	21.3	21.7	19.3	51.01
1959	115	16.1	16.4	24.7	30.13
1960	147	20.6	20.8	25.3	37.30
1961	135	18.9	18.9	22.9	37.45
1962	132	18.5	18.5	27.2	30.88
1963	137	19.2	19.0	29.1	29.62
1964	221	30.9	30.3	30.4	45.22
1965	172	24.1	23.2	50.3	20.93
1966	303	42.4	40.0	42.0	43.21
1967	239	33.5	31.0	43.9	32.04
1968	265	37.1	34.4	45.6	34.23
1969	257	36.0	32.4	52.0	28.27
1970	312	43.7	37.0	43.0	39.04
1971	227	31.8	25.4	39.6	29.10
1972	383	53.6	40.3	48.0	38.09
1973	495	70.5	45.2	65.5	31.31
1974	375	52.5	27.5	40.8	30.58
1975	483	65.1	30.4	50.7	27.21
1976	1282	153.0	72.5	59.4	55.38

Notes: [a]Value of coffee actually exported

[b]Converted from shillings using exchange rates at Footnote 5.

[c]Vxa = (Vx/Iu)100; for Iu data see Appendix Table 8.

[d]Qx = Quantity of coffee sold for export.

[e]Pxa = Vxa/Qx

Sources:

(i) Annual Trade Report of Kenya, Uganda, and Tanzania, (Mombasa, Kenya: East African Customs and Excise Department, several issues).

(ii) The Economist Intelligence Unit, The Economy of East Africa: A Study of Trends, (London: St. James, 1955).

(iii) TCS/CAT records.

TABLE 8

DERIVATION OF TANZANIA'S COFFEE EXPORT PRICE (Pta)[a]

Year	Tanzania's Coffee Production[b] (thousand metric tons) Arabica(Qa)	Robusta(Qr)	Total(Qt)	N.Y. Annual Ave. Spot Prices (¢/lb. current) Arabica(Spa)	Robusta(Spr)	Index of Manufactures Exports(Iu)[c]	Pta (¢/lb Constant 1962)
1955	8.6	11.2	19.8	66.02	44.83	95	58.10
1956	12.1	7.1	19.2	72.35	36.58	96	61.59
1957	10.0	11.8	21.8	68.25	37.04	99	51.88
1958	10.3	12.2	22.5	54.50	39.55	98	47.34
1959	12.9	10.1	23.0	46.16	31.75	98	40.65
1960	14.2	10.7	24.9	44.98	23.80	99	36.24
1961	19.1	9.4	28.5	43.96	19.75	100	35.97
1962	19.2	9.8	29.0	41.54	20.44	100	34.41
1963	21.5	7.2	28.7	39.66	25.50	101	35.75
1964	28.5	12.9	41.4	46.28	36.37	102	42.35
1965	24.2	8.0	32.2	48.48	30.15	104	42.24
1966	41.4	10.6	52.0	48.60	34.78	106	43.19
1967	35.8	8.8	44.6	42.50	33.23	108	37.66
1968	35.4	10.8	46.2	42.52	34.30	108	37.59
1969	42.9	9.7	52.6	42.02	32.30	111	36.24
1970	32.2	12.4	44.6	50.36	40.42	118	37.97
1971	35.3	10.4	45.7	50.36	42.67	125	38.89
1972	42.6	9.9	52.5	53.77	43.66	133	38.99
1973	37.4	10.1	47.5	70.23	48.09	156	42.00
1974	30.8	11.5	42.3	76.50	58.19	191	37.45
1975	43.3	8.8	52.1	78.14	55.08	214	34.69
1976	44.6	10.8	55.4	157.70	127.60	210[d]	72.30

Notes: [a] $Pta = \frac{(SpaQa + SprQr)\ 100}{QtIu}$

[b] Production = Deliveries of coffee to the Tanganyika Coffee Board = TCB (now Coffee Authority of Tanzania - CAT). Production rather than exports figures have been used because our source of data dis not for the most part break down export figures into the various types of coffee. However, since TCB/CATs sales for local consumption are a very small proportion of their total sales (less than 2 percent on average), export figures closely mirror those of production, particularly in coffee type proportions, if not in totals.

[c] U.N. Index of Unit Values of manufactured exports from developed market economies.

[d] Six months average.

Source: (i) Tanzania Production figures: Appendix Table 1.
(ii) New York market spot prices: Pan-American Coffee Bureau, Annual Coffee Statistics, 1975 (New York: Pan-American Coffee Bureau, 1976), Tables P-8 and P-11, pp. A-104 and A-107.
(iii) U.N. index of unit values of manufactured exports from developed market economies: International Coffee Organization, Coffee Prices in Current and Constant Terms, Document EB 1401/75(E) Rev. 2, (London: ICO, September 20, 1976), Annex Table 5.

TABLE 9

TERMS OF TRADE INDICES FOR TANZANIA's COFFEE EXPORTS (1962 = 100)

	Fertilizer Imports[a]			Cides Imports[a]		
Year	Quantity[b] (1000 met. tons)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})	Quantity[b] (1000 met. tons)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})
1949	1.0	0.2	170	0.4	0.2	63
1950	3.6	0.1	142	0.5	0.1	25
1951	3.1	1.2	110	0.7	0.2	36
1952	6.3	0.3	162	0.7	0.3	80
1953	0.9	0.2	189	0.6	0.2	42
1954	3.1	0.4	110	1.1	0.4	45
1955	3.7	0.6	138	1.3	0.6	58
1956	5.5	0.5	124	0.7	0.7	71
1957	6.9	0.3	123	0.7	0.3	54
1958	4.9	0.4	139	0.7	0.4	71
1959	5.4	0.5	126	0.9	0.5	80
1960	6.7	0.7	127	1.0	0.7	88
1961	7.1	0.6	120	0.9	0.6	83
1962	8.5	0.8	100	1.0	0.8	100
1963	10.3	0.9	99	1.1	0.9	102
1964	18.9	1.0	108	1.3	1.0	96
1965	21.5	1.4	119	1.8	1.4	97
1966	23.1	2.2	118	2.6	2.2	106
1967	22.3	1.1	122	1.3	1.0	106
1968	29.7	1.5	109	1.7	1.5	110
1969	35.5	11.5	110	1.5	1.5	125
1970	39.3	2.6	95	2.6	2.6	125
1971	54.3	2.5	106	2.8	2.5	136
1972	41.9	3.1	97	2.5	3.1	155
1973	43.0	7.9	138	4.9	7.9	208
1974	20.9	9.8	797	4.3	9.8	286
1975	52.5	7.4	169	3.4	7.4	272

Notes: [a]Net imports from all sources including imports for domestic consumption, warehousing and re-exports.

[b]Where quantity was given in long tons, they have been converted to metric tons using the conversion: 1 metric ton = 0.984 long tons.

[c]In cases where the value of imports was given in Pounds Sterling, an exchange rate of 1 Pound = Sh. 20 has been used. For rates of exchange to US dollars, see Footnote 5, Chapter I.

TABLE 9 (continued)

TERMS OF TRADE INDICES FOR TANZANIA'S COFFEE EXPORTS (1962 = 100)

	Cement Imports[a]			Unmotorized Cycle Imports[a]		
Year	Quantity[b] (1000 met tons)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})	Quantity[b] (# 1000)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})
1949	82.4	2.7	197	12.3	0.4	[illegible]
1950	108.7	2.5	138	13.5	0.3	[illegible]
1951	112.1	3.7	198	20.7	0.6	[illegible]
1952	106.2	4.0	226	54.6	1.6	[illegible]
1953	125.8	3.9	186	27.4	0.8	[illegible]
1954	111.7	3.1	167	46.4	1.4	[illegible]
1955	160.9	4.3	160	66.1	1.9	99
1956	102.3	2.8	164	52.3	1.1	106
1957	96.5	2.8	174	72.8	2.1	100
1958	64.3	1.6	149	39.4	1.1	96
1959	24.2	0.5	124	37.0	1.1	102
1960	28.4	0.6	127	40.0	1.2	104
1961	20.6	0.4	117	17.5	0.5	99
1962	12.0	0.2	100	20.7	0.6	100
1963	10.1	0.2	119	29.7	0.8	93
1964	3.3	0.1	182	38.0	1.1	100
1965	1.0	0.1	300	22.3	0.6	93
1966	2.3	0.1	261	29.1	0.8	95
1967	3.3	0.1	182	25.3	0.7	95
1968	4.9	0.2	245	36.2	1.1	105
1969	6.3	0.2	190	29.4	0.8	94
1970	17.2	1.4	140	43.3	1.2	96
1971	115.3	2.5	130	38.8	1.2	107
1972	173.6	4.4	152	27.8	0.7	87
1973	72.3	2.6	216	65.7	1.9	100
1974	27.1	1.1	244	74.6	2.6	120
1975	18.7	1.2	285	42.4	1.5	122

TABLE 9 (continued)

TERMS OF TRADE INDICES FOR TANZANIA'S COFFEE EXPORTS (1962 = 100)

	Buses, Trucks & Vans Imports[a]			Tractors Imports[a]		
Year	Quantity[b] (#1000)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})	Quantity[b] (#1000)	Value[c] ($ mn.)	Price Index[d] (Pm_{01})
1949	0.9	2.1	89	0.9	3.6	200
1950	1.0	1.6	61	0.6	2.1	175
1951	1.4	2.1	57	0.5	1.1	110
1952	1.2	2.6	83	0.4	1.8	225
1953	0.8	1.8	86	0.2	0.9	225
1954	1.4	2.8	76	0.1	0.5	250
1955	3.7	6.8	70	0.3	0.7	117
1956	3.0	6.6	84	0.3	0.8	133
1957	2.5	5.5	84	0.3	0.9	150
1958	2.6	5.9	86	0.3	0.5	83
1959	2.3	5.6	93	0.4	0.9	113
1960	2.4	6.1	97	0.4	1.4	175
1961	1.6	3.6	86	0.3	1.5	250
1962	1.6	4.2	100	0.3	0.6	100
1963	2.0	4.9	93	0.9	1.9	106
1964	2.4	6.2	98	0.6	2.3	192
1965	3.0	8.4	107	0.6	2.1	175
1966	3.9	13.6	133	0.4	1.6	200
1967	3.2	11.8	140	0.5	2.4	240
1968	4.6	15.8	131	0.9	3.4	189
1969	4.1	12.1	112	0.8	3.1	194
1970	4.0	14.4	137	0.9	2.7	150
1971	4.8	21.0	167	0.7	2.8	200
1972	2.7	14.9	210	0.6	3.5	292
1973	4.2	24.2	220	0.1	0.8	400
1974	4.3	29.9	265	0.7	4.7	336
1975	2.3	22.8	378	0.7	5.5	393

TABLE 9 (continued)

TERMS OF TRADE INDICES FOR TANZANIA'S COFFEE EXPORTS (1962 = 100)

Year	Mean Imports Price Index[a] ($\overline{Pm}_{01}$)	Coffee Export Sales: Quantity[b] (1000 met. tons)	Coffee Export Sales: Value[c] ($ mn.)	Value Index[f] (Vx_{01})	Price Index[g] (Px_{01})	Terms of Trade: Commodity[h] (Tc_{01})	Terms of Trade: Income[i] (Ti_{01})
1949	139	14.8	5.8	31	58	42	22
1950	103	16.3	9.7	52	87	84	51
1951	102	18.3	12.6	68	101	99	67
1952	146	15.0	15.5	84	152	104	58
1953	138	19.0	16.2	88	125	91	64
1954	125	18.2	28.0	151	226	181	121
1955	107	21.3	19.3	104	133	124	97
1956	114	18.2	25.9	140	209	183	123
1957	114	21.9	20.0	108	134	118	95
1958	104	19.3	21.3	115	162	156	111
1959	107	24.7	16.1	87	96	90	81
1960	120	25.3	20.6	111	120	100	93
1961	126	22.9	18.9	102	121	96	81
1962	100	27.2	18.5	100	100	100	100
1963	102	29.1	19.2	104	97	95	102
1964	129	30.4	30.9	167	149	116	129
1965	149	50.3	24.1	130	70	47	87
1966	152	42.0	42.4	229	148	97	151
1967	148	43.9	33.4	181	112	76	122
1968	148	45.6	37.1	201	120	81	136
1969	138	52.0	36.0	195	102	74	141
1970	124	43.0	43.7	236	149	120	190
1971	141	39.6	31.8	172	118	84	122
1972	166	48.0	53.6	290	164	99	175
1973	214	65.5	70.5	381	158	74	178
1974	341	40.8	52.5	284	189	55	83
1975	320	50.7	65.2	352	189	59	110

Notes: [d] $Pm_{01} = (Pm_1/Pm_0)\ 100$ [e] $\overline{Pm}_{01} = 1/6\ \Sigma\ Pm_{01}$

[f] $Vx_{01} = (Vx_1/Vx_0)\ 100$ [g] $Px_{01} = (Px_1/Px_0)\ 100$

[h] $Tc_{01} = (Px_{01}/\overline{Pm}_{01})\ 100$ [i] $Ti_{01} = (Vx_1/Vx_0\ \overline{Pm}_{011})\ 100$

Where: Vx_1 = Value of coffee exported during a given year
Vx_0 = Value of coffee exported during the base year (1962)
$\overline{Pm}_{010}$ = Mean imports price index for the base year (1962)
$\overline{Pm}_{011}$ = Mean imports price index for a given year

Sources:
(i) Annual Trade Report of Kenya, Uganda, and Tanzania, (Mombasa, Kenya: East African Customs and Excise Department, several issues).
(ii) The Economist Intelligence Unit, The Economy of East Africa: A Study of Trends, (London: St. James, 1955).
(iii) TCB/CAT records.

APPENDIX TABLE 10

AN INDICATOR PRICE INDEX FOR TANZANIA'S COFFEE EXPORT SALES (Pia)

Year	Pm (¢/lb)	Pr (¢/lb)	Ph (¢/lb)	Qm (1000 met. tons)	Qr (1000 met. tons)	Qh (1000 met. tons)	Qs (1000 met. tons)	Pi (¢/lb)	Iu	Pia
1964	48.50	35.97	46.66	25.95	3.81	2.37	32.13	46.86	102	45.96
1965	48.21	30.65	43.92	20.61	7.38	1.14	29.13	43.89	104	41.91
1966	47.35	33.53	40.56	34.85	10.82	3.63	49.31	43.82	106	41.34
1967	41.61	33.52	37.72	30.25	7.61	3.10	40.96	39.81	108	36.86
1968	42.42	33.86	37.36	36.52	9.87	3.85	50.24	40.70	111	36.67
1969	44.44	33.11	40.90	39.89	9.06	3.91	52.87	42.24	118	35.80
1970	56.66	41.44	55.80	28.16	11.40	3.78	43.34	52.58	125	42.06
1971	49.01	42.27	44.70	30.69	9.21	1.93	41.83	47.33	133	35.59
1972	56.70	45.19	52.52	38.23	11.11	3.10	52.44	54.02	156	34.63

Notes: Pm = ICO indicator price for Colombia Mild Arabica.
Pr = ICO indicator price for Robusta.
Ph = ICO indicator price for Unwashed Arabica.
Qm = TCB/CAT export sales of Mild Arabica.
Qr = TCB/CAT export sales of Robusta.
Qh = TCB/CAT export sales of Hard Arabica.
Qs = Qm + Qr + Qh
Pi = ICO indicator price equivalent of Tanzania's coffee sold for export
= Pm Qm/Qs + Pr Qr/Qs + Ph Qh/Qs
Iu = UN Index of manufactured exports of developed market economies, 1962 = 100.
Pia = (Pi/Iu) 100

Sources: Indicator Prices: Annual Coffee Statistics 1975, (New York: PACB, 1976).
Quantities: TCB/CAT Annual Reports and other records.

TABLE 11

COFFEE EXPORTS TO ALL DESTINATIONS BY ICA MEMBER COUNTRIES BY COFFEE TYPES

(in million bags)

Year	Colombian Mild Arabicas	Unwashed Arabicas	Other Mild Arabicas	Robustas	Total
1953	7.8	16.0	6.5	3.6	34.6
1954	6.1	11.4	5.7	3.2	28.9
1955	6.5	14.4	6.4	3.5	33.7
1956	5.8	17.3	6.3	4.9	38.4
1957	5.5	15.2	6.8	4.6	36.1
1958	6.2	13.5	7.9	5.0	36.5
1959	7.2	18.6	7.4	5.4	42.6
1960	6.9	17.8	7.5	9.0	42.5
1961	6.6	18.0	8.0	10.0	43.7
1962	7.7	17.5	8.9	9.8	46.3
1963	7.1	20.7	9.0	10.0	48.9
1964	7.7	16.2	10.1	12.0	46.7
1965	6.8	14.9	9.6	11.9	45.0
1966	7.3	18.3	9.9	13.6	49.0
1967	7.7	18.6	10.2	13.7	50.2
1968	8.0	20.4	10.6	14.6	53.6
1969	8.1	21.1	10.6	14.4	54.2
1970	8.2	18.4	11.1	15.0	52.7
1971	8.1	20.0	11.3	14.2	53.5
1972	8.5	20.7	13.0	15.7	57.9
1973	9.0	21.3	15.2	17.1	62.6
1974	8.8	14.3	14.2	17.5	54.8
1975	10.1	15.7	15.7	16.4	57.8
1976[a]	8.3	16.9	16.4	16.5	58.3

Note: a = Estimates

Source: Anuario Estatistico do Cafe, (Rio de Janeiro: IBC, December 1977). Table 5.2.1.

TABLE 12

UNITED STATES COFFEE IMPORTS BY TYPES

(in million bags)

Year	Arabicas			Robustas	Total[a]	Percent from IC Members
	Milds					
	Colombia	Other	Unwashed			
1953	5.1	4.9	9.4	0.9	21.1	96.4
1954	4.9	4.2	6.7	0.7	17.1	96.9
1955	4.9	5.0	8.2	0.8	19.6	96.5
1956	4.6	4.4	10.2	1.4	21.2	96.4
1957	4.1	4.9	9.4	1.4	20.9	95.1
1958	4.2	5.8	7.9	1.2	20.2	94.7
1959	4.9	5.3	10.9	1.2	23.3	95.8
1960	4.3	4.6	9.8	3.2	22.1	98.8
1961	4.1	4.8	9.3	3.9	22.5	98.7
1962	4.4	5.5	9.8	4.6	24.6	98.6
1963	4.0	4.9	10.1	3.9	23.9	95.7
1964	3.7	5.7	8.1	4.9	22.9	98.0
1965	3.3	5.5	6.9	5.0	21.3	97.3
1966	3.1	5.2	7.5	5.6	22.1	97.2
1967	3.3	5.2	7.1	5.2	22.3	98.0
1968	3.5	5.4	9.3	6.8	25.4	09.4
1969	2.8	5.2	6.7	5.0	20.2	97.9
1970	3.0	5.1	5.8	5.6	19.7	98.8
1971	3.0	5.4	7.1	5.8	21.7	98.4
1972	3.1	5.1	7.2	5.0	20.8	98.5
1973	3.2	6.8	5.7	5.7	21.8	98.1
1974	3.4	6.1	3.2	6.1	19.2	97.8
1975	3.9	6.9	4.3	4.8	20.3	98.6
1976	3.1	7.3	3.8	5.1	19.8	98.0

Note: a = Imports from all sources while coffee types imports are only from ICA member countries.

Source: Anuario Estatistico do Cafe, (Rio de Janeiro: IBC, December 1977), Table 6.9.

TABLE 13

UNITED STATES COFFEE CONSUMPTION
(cups per person[a] per day)

Year	Regular	Soluble		Total All Coffee
		All Soluble	Freeze Dried	
1953	2.31	0.26	na	2.57
1954	2.30	0.30	na	2.60
1955	2.30	0.37	na	2.67
1956	2.22	0.46	na	2.68
1957	2.32	0.50	na	2.82
1958	2.32	0.55	na	2.87
1959	2.34	0.60	na	2.94
1960	2.21	0.56	na	2.77
1961	2.33	0.64	na	2.97
1962	2.45	0.67	na	3.12
1963	2.36	0.65	na	3.01
1964	2.29	0.61	na	2.90
1965	2.21	0.58	na	2.79
1966	2.23	0.63	na	2.86
1967	2.19	0.65	na	2.84
1968	2.08	0.64	na	2.72
1969	1.99	0.69	0.11	2.68
1970	1.91	0.66	0.16	2.57
1971	1.83	0.67	0.16	2.50
1972	1.67	0.68	0.14	2.35
1973	1.61	0.69	0.25	2.30
1974	1.50	0.75	0.30	2.25
1975	1.52	0.68	0.29	2.20
1976	1.48	0.63	0.25	2.11

Note: a = Ten years and older

Source: PACB, Coffee Drinking in the United States, Winter 1976. (New York: Pan American Coffee Bureau, 1976), p. 3 and p. 22.

TABLE 14

COFFEE IMPORTS: NORTHWESTERN EUROPE
(million bags)

	Germany			Sweden			Holland			Finland		
	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.
1953	.263	1.309	.056	.087	.854	.013	.041	.471	.200	.028	.384	-
1954	.356	1.720	.075	.113	.802	.021	.059	.461	.237	.031	.474	-
1955	.357	1.997	.055	.133	.884	.014	.086	.523	.167	.037	.496	-
1956	.326	2.251	.064	.122	.966	.015	.072	.689	.299	.038	.564	-
1957	.297	2.567	.078	.117	.956	.014	.065	.653	.301	.028	.505	.031
1958	.423	2.661	.066	.161	1.049	.015	.100	.721	.339	.030	.523	.031
1959	.590	3.110	.056	.171	1.132	.011	.134	.853	.343	.049	.560	.007
1960	.934	3.323	.087	.177	1.222	-	.166	.917	.359	.053	.568	.028
1961	.986	3.540	.093	.223	1.295	.011	.145	1.147	.485	.093	.638	.028
1962	1.115	3.900	.136	.240	1.397	.042	.200	1.063	.383	.103	.654	.035
1963	1.218	3.951	.193	.256	1.445	.053	.180	1.257	.467	.108	.694	.035
1964	1.364	4.266	.197	.357	1.522	.040	.275	1.380	.552	.164	.785	.041
1965	1.379	4.587	.385	.411	1.530	.046	.232	1.378	.556	.171	.665	.031
1966	1.207	4.658	.476	.394	1.614	.050	.235	1.417	.568	.218	.762	.022
1967	1.276	4.593	.556	.410	1.690	.049	.288	1.572	.567	.261	.632	.026
1968	1.336	5.008	.688	.447	1.769	.054	.330	1.701	.560	.278	.813	.017
1969	1.433	5.128	.639	.448	1.766	.060	.429	1.969	.669	.313	.915	.013
1970	1.362	5.139	.816	.453	1.769	.114	.381	1.838	.633	.478	1.328	.032
1971	1.771	5.381	.758	.468	1.697	.096	.525	2.052	.618	.130	.473	.012
1972	1.734	5.682	.712	.522	1.789	.086	.522	2.189	.540	.296	.897	.020
1973	1.841	5.668	.840	.538	1.837	.090	.562	2.205	.502	.349	.988	.020
1974	1.773	5.074	.809	.569	1.700	.108	.675	2.231	.767	.392	.982	-
1975	2.134	5.369	.615	.627	1.850	.066	.814	2.502	.710	.423	.986	-
1976	2.225	2.985	.811	.724	1.979	.063	.739	2.648	.981	.349	1.551	.005

TABLE 14 (continued)

	Denmark			Norway			Total	Colombian Milds		Robusta		Percentage from ICA Members
	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Bags	Bags	%	Bags	%	
1953	.008	.431	-	-	.311	.019	3.760	.417	11.1	.288	7.7	92.8
1954	.010	.43[illegible]	-	.002	.289	.027	4.159	.551	13.2	.360	8.7	93.5
1955	.010	.47[illegible]	-	-	.354	.017	4.724	.647	13.7	.253	5.4	92.8
1956	.013	.52[illegible]	-	-	.369	.027	5.342	.571	10.7	.405	7.6	92.5
1957	.013	.54[illegible]	.001	-	.397	.036	5.627	.522	9.3	.461	8.2	93.5
1958	.025	.62[illegible]	.009	.001	.451	.032	6.026	.740	12.3	.474	7.9	93.0
1959	.028	.64[illegible]	.075	.038	.418	.022	6.713	1.010	15.0	.514	7.7	95.5
1960	.030	.69[illegible]	.092	.014	.483	.023	7.211	1.374	19.0	.589	8.2	96.1
1961	.029	.727	.105	.020	.450	.023	7.797	1.486	19.1	.745	9.6	96.4
1962	.037	.761	.108	.029	.516	.028	8.291	1.724	20.8	.732	8.8	97.3
1963	.038	.883	.115	.033	.560	.032	8.790	1.833	20.9	.895	10.2	97.8
1964	.040	.805	.110	.059	.552	.027	9.310	2.259	24.3	.967	10.4	98.2
1965	.048	.824	.120	.041	.478	.023	9.462	2.282	24.1	1.161	12.3	98.4
1966	.053	.886	.127	.059	.576	.024	9.913	2.166	21.9	1.267	12.8	98.5
1967	.055	.880	.119	.065	.590	.022	10.157	2.355	23.2	1.339	13.2	98.1
1968	.067	.934	.131	.054	.575	.023	10.800	2.512	23.3	1.473	13.6	98.0
1969	.072	1.000	.125	.062	.654	.025	11.432	2.757	24.1	1.531	13.4	98.1
1970	.084	.970	.141	.055	.632	.034	11.676	3.013	25.8	1.770	15.2	96.7
1971	.096	.972	.117	.069	.523	.015	11.098	3.059	27.6	1.616	14.6	98.7
1972	.099	1.014	.124	.061	.655	.014	12.226	3.234	26.5	1.496	12.2	98.7
1973	.085	.990	.157	.057	.606	.020	12.294	3.432	27.9	1.629	13.3	98.6
1974	.119	.956	.219	.080	.610	.036	11.553	3.608	31.2	1.939	16.8	97.7
1975	.095	1.026	.192	.076	.623	.020	12.356	4.169	33.7	1.603	13.0	98.8
1976	.087	1.003	.018	.042	.633	.023	13.799	4.166	30.2	1.901	13.8	89.8

Source: Anuario Estatistico do Cafe, (Rio de Janeiro: IBC, December 1977), Tables: 6.8, 6.10, 6.12, 6.17, and 6.18.

TABLE 15

COFFEE IMPORTS: OTHERS EUROPE, CANADA, AUSTRALIA, JAPAN
(million bags)

	France[a]			Canada			Italy			Japan		
	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.
1953	.026	2.839	.664	.279	.813	.003	.035	1.112	.184	.[illegible]	.[illegible]	-
1954	.025	2.811	.681	.247	.721	.004	.046	1.158	.316	.[illegible]	.[illegible]	-
1955	.031	2.985	.678	.239	.785	.007	.031	1.206	.191	.[illegible]	.[illegible]	.008
1956	.015	3.038	.743	.214	.829	.011	.025	1.262	.257	.[illegible]	.[illegible]	.017
1957	.014	3.166	.748	.220	.836	.009	.009	1.296	.354	.[illegible]	.[illegible]	.011
1958	.019	3.182	.679	.243	.895	.013	.032	1.357	.358	.[illegible]	.[illegible]	.012
1959	.013	3.398	.992	.270	1.015	.024	.040	1.400	.325	.[illegible]	.[illegible]	.011
1960	.010	3.307	2.415	.277	.995	.061	.041	1.653	.412	.[illegible]	.[illegible]	.027
1961	.016	3.300	2.433	.288	1.119	.091	.051	1.753	.487	.055	.252	.046
1962	.028	3.449	2.506	.297	1.230	.073	.054	1.865	.551	.044	.256	.044
1963	.032	3.645	2.686	.292	1.288	.091	.070	1.942	.567	.072	.287	.065
1964	.053	3.842	2.862	.290	1.248	.101	.085	1.992	.616	.056	.365	.121
1965	.044	3.617	2.318	.309	1.258	.138	.082	2.006	.767	.042	.311	.105
1966	.040	3.794	2.717	.267	1.164	.184	.064	2.057	.639	.110	.769	.396
1967	.056	3.659	2.560	.314	1.344	.274	.087	2.420	.567	.092	.679	.247
1968	.070	4.091	2.903	.195	1.394	.302	.114	2.536	.455	.095	.755	.234
1969	.073	3.974	2.621	.179	1.363	.279	.123	2.593	.493	.132	.986	.268
1970	.058	3.984	2.733	.153	1.256	.330	.089	2.741	.548	.158	1.356	.465
1971	.111	4.191	2.698	.174	1.412	.329	.106	2.296	.480	.163	1.141	.557
1972	.132	4.305	2.800	.155	1.317	.310	.115	2.958	.502	.157	1.661	.723
1973	.139	4.498	2.932	.200	1.293	.249	.120	3.365	.935	.269	2.174	1.026
1974	.179	4.645	3.218	.223	1.303	.206	.122	3.349	1.381	.145	1.423	.492
1975	.216	4.898	3.219	.225	1.386	.224	.122	3.398	1.196	.189	1.823	.770
1976	.232	4.770	3.351	.188	1.321	.224	.040	3.518	.580	.265	2.458	.932

Note: a = France granted independence to its coffee producing African territories in 1960. It appears that prior to independence, France recorded her imports of coffee from these territories as domestic transfers rather than as imports hence the large jump in her imports of Robustas in 1960.

TABLE 15 (continued)

	Bel/Lux			Switzerland			Britain			Austria		
	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.	Colo.	Tot.	Rob.
1953	.085	.8[illegible]	199	.031	.319	.039	.186	.507	.245	.002	.074	.001
1954	.069	.7[illegible]	229	.025	.319	.046	.193	.561	.181	.003	.080	.002
1955	.080	.7[illegible]	209	.021	.299	.034	.261	.574	.176	.002	.095	.001
1956	.055	1.0[illegible]	310	.022	.374	.050	.294	.749	.233	.003	.122	.004
1957	.054	.8[illegible]	300	.021	.367	.060	.347	.757	.225	.002	.138	.012
1958	.075	.87[illegible]	295	.029	.384	.065	.297	.736	.255	.002	.150	.008
1959	.103	.983	.280	.032	.446	.059	.297	.883	.378	.007	.163	.001
1960	.104	1.109	.308	.090	.498	.081	.266	.919	.427	.031	.203	.005
1961	.100	1.036	.281	.097	.540	.115	.285	.978	.447	.039	.218	.018
1962	.080	.923	.197	.087	.507	.112	.272	1.154	.580	.029	.224	.025
1963	.098	.922	.195	.101	.576	.128	.502	1.275	.462	.037	.252	.028
1964	.159	1.049	.215	.086	.601	.169	.377	1.303	.636	.038	.285	.027
1965	.189	1.090	.247	.082	.736	.281	.163	.973	.613	.039	.282	.045
1966	.130	.905	.187	.083	.671	.208	.212	1.360	.741	.037	.292	.033
1967	.181	1.038	.166	.079	.601	.174	.218	1.344	.780	.044	.314	.037
1968	.192	1.050	.134	.090	.719	.209	.215	1.529	.884	.047	.342	.037
1969	.190	1.139	.146	.133	.874	.234	.185	1.704	.965	.068	.376	.023
1970	.116	.973	.187	.108	1.008	.269	.194	1.535	.803	.865	.342	.019
1971	.172	1.104	.173	.119	1.041	.287	.309	1.796	.805	.078	.432	.005
1972	.148	1.109	.154	.112	1.123	.306	.257	1.699	.757	.087	.469	.012
1973	.107	1.280	.162	.123	1.037	.334	.274	2.038	.845	.071	.416	.020
1974	.150	1.181	.171	.112	.976	.308	.222	1.646	.859	.063	.391	.042
1975	.131	1.409	.143	.111	1.092	.327	.169	1.510	.657	.054	.510	.031
1976	.127	1.366	.160	.084	.964	.342	.210	1.607	.891	.062	.490	.060

TABLE 15 (continued)

	Australia			Total	Colo.		Rob.		Percentage from ICA
	Colo.	Tot.	Rob.	Market	bags	%	bags	%	Members
1953	.030	.070	.028	6.651	.679	10.2	1.364	20.5	83.4
1954	.023	.062	.028	6.467	.636	9.8	1.487	23.0	76.9
1955	..020	.077	.046	6.870	.693	10.1	1.350	19.7	80.5
1956	.030	.117	.063	7.589	.672	8.9	1.688	22.2	79.5
1957	.033	.106	.046	7.606	.711	9.3	1.765	23.2	72.9
1958	.034	.124	.067	7.809	.144	9.5	1.752	22.4	75.0
1959	.042	.168	.090	8.591	.833	9.7	2.160	25.1	79.1
1960	.032	.186	.102	9.048	.894	9.9	3.838	42.4	88.1
1961	.025	.156	.079	9.352	.956	10.2	3.997	42.7	90.7
1962	.017	.185	.078	9.793	.908	9.3	4.166	42.5	89.1
1963	.021	.197	.060	10.384	1.225	11.8	4.282	41.2	90.0
1964	.013	.231	.086	10.916	1.157	10.6	4.833	44.3	89.9
1965	.010	.239	.085	10.512	.960	9.1	4.599	43.8	88.1
1966	.008	.269	.100	11.281	.951	8.4	5.205	46.1	87.8
1967	.013	.299	.120	11.698	1.084	9.3	4.925	42.1	88.9
1968	.011	.289	.088	12.705	1.039	5.2	5.246	41.3	88.8
1969	.016	.331	.116	13.340	1.099	8.2	5.145	33.6	89.6
1970	.033	.375	.104	13.570	.974	7.2	5.458	40.2	90.4
1971	.008	.382	.116	13.795	1.129	8.2	5.450	39.5	90.9
1972	.035	.368	.103	15.009	1.198	8.0	5.667	37.8	90.3
1973	.024	.430	.166	16.531	1.328	8.0	6.669	40.3	87.5
1974	.023	.465	.171	15.379	1.239	8.1	6.848	44.5	85.9
1975	.011	.569	.354	16.595	1.228	7.4	6.921	41.7	86.6
1976	.033	.493	.243	16.987	1.241	7.3	7.323	43.1	80.3

Source: Anuario Estatistico do Cafe, (Rio de Janeiro: IBC, December, 1977). Tables 6.4, 6.5, 6.6, 6.7, 6.11, 6.13, 6.14, 6.16 and 6.19.

TABLE 16

TRENDS IN WORLD COFFEE STOCKS: 1962/63-1977/78

Coffee Year	World Total (mn. bags)	World Index 1968/69=100	Brazil Total (mn. bags)	Brazil Index 1968/69=100	Rest of the World Total (mn. bags)	Rest of the World Index 1968/69=100
1962/63	71.7	100	64.3	117	7.4	45
1963/64	71.3	100	61.7	112	9.6	55
1964/65	68.8	96	56.2	102	12.6	76
1965/66	86.2	121	71.5	130	14.7	90
1966/67	81.5	114	66.8	122	14.7	89
1967/68	80.4	113	64.8	118	15.6	95
1968/69	71.6	100	54.9	100	61.5	100
1969/70	65.3	91	45.7	83	19.6	119
1970/71	54.6	76	31.6	58	23.0	139
1971/72	54.9	77	31.8	58	23.1	140
1972/73	55.9	78	31.8	58	24.1	146
1973/74	40.9	57	20.8	37	20.1	122
1974/75	49.3	69	28.2	53	21.1	128
1975/76	46.8	66	29.9	54	16.9	102
1976/77	26.5	37	14.3	26	12.2	74
1977/78[e]	26.2	37	12.0	22	14.2	86

Note: e = estimate

Sources: (i) 1962/63-1974/75: Long Term Historical Data on Production, Stocks Exports and Prices of Coffee, EB 1407/75 (E), (London: ICO, November 11, 1975). Table 3.

(ii) 1975/76-1977/78: Quarterly Statistical Bulletin on Coffee, April-June 1977, Vol. 1, #2,(London: ICO, 1977), Table III-1.

As this table indicates both world and Brazil's levels of coffee stocks attained their respective all time peaks during the 1965/66 coffee year and these stocks have been declining ever since. It will be remembered that the ICA's Coffee Diversification Fund came into being during the 1968/69 coffee year and that its operations were suspended together wit the other economic clauses of the agreement at the end of t he 1971/72 coffee year. As text Table 11 shows, Brazil experienced a serious frost in 1969. This frost in part accounted for the 17 per cent and 25 per cent drops in that country's level of stocks during 1969/70 and 1970/71, respectively. Another frost in 1972 contributed to the 21 per cent drop in Brazil's stocks in 1973/74. The 1975 frost dealt yet another blow to the country's already precarious level of stocks, causing them to drop by some 28 percentage points in 1975/76. Appendix Table 16 clearly shows that the world's stocks level has closely mirrored that of Brazil; consequently these fluctuations in Brazil's stocks resulted in similar movements in the world's stocks. These facts serve to point to the fact that the operations of the Diversification Fund had very little to do with the declining level of world's coffee stocks. We should note in this regard that, as is indicated in Appendix Table 16, all through the period of the Fund's operation, stocks in the rest of the world continued to rise.

TABLE 17

TANZANIA'S COFFEE PRODUCTION, SALES AND STOCKS: 1962/63-1971/72

(thousand metric tons)

Year	Production[a]	Quota Sales	Non-Quota Sales	Sales for Domestic Processing	Carry-over Stocks
1962/63	28.7	25.6	1.6	na	1.5
1963/64	35.8	27.1	2.4	0.1	6.2
1964/65	32.2	24.5	5.9	0.2	1.6
1965/66	52.0	39.2	11.8	0.4	0.6
1966/67	44.6	26.0	16.4	0.4	1.8
1967/68	46.2	29.8	15.8	0.8	-0.2
1968/69	52.7	36.9	15.0	0.5	0.3
1969/70	44.6	38.8	4.2	0.8	0.8
1970/71	46.8	36.1	3.5	1.9	5.3
1971/72	52.4	44.8	3.1	1.3	3.2

Notes:

[a]Deliveries to curing works.

Source:

TCB/CAT Annual Reports and other records.

TABLE 18

EVOLUTION OF TANZANIA'S COFFEE EXPORT QUOTAS: 1963/64-1969/70

(bags)

Dates	Quota Adjustments	Annual Quota Change[a]	Annual Quota Initial and Effective	Tanzania's Basic Quota
1963/64:				
October 1	Tanzania's initial quota set at 99% of basic quota		431,103	435,458
February 12	Council increases initial quotas to 102.15% of basic quotas	13,717	444,820	
June 12	Executive Board of ICO distributes 725,000 bags quota shortfalls to countries with surpluses	7,393		
	Tanzania's effective quota for 1963/64		452,213	
1964/65:				
October 1	Tanzania's initial quota set at 102.67% of basic quota		447,085	435,458
March 9	Council approves reduction of 1964/65 annual quota by 1.9 million bags	-17,995		
May 21	Executive Board approves cut of quotas by 4.5% due to daily index of prices remaining below the floor for 15 market days	-20,119		
	Discrepancy	-1,879		
	Tanzania's Effective quota for 1964/65		407,092	
1965/66:				
October 1	Tanzania's initial quota		410,684	435,458
December 12	Tanzania granted waiver	50,000		
March 29	Third and fourth quota waivers withdrawn due to indicator price remaining below the floor price for 15 market days	-25,000		
	Tanzania's effective quota for 1965/66		435,684	

TABLE 18 (continued)

1966/67:				
October 1	Tanzania's initial quota		468,812	435,458
February 13	Colombian Mild Arabicas group quota cut by 120,622 bags as group indicator price remains below the floor for 15 market days	-7,599		
February 23	Global annual quota is cut by 2 million bags due to composite indicator price remaining below floor for 15 market days	-18,940		
March 13	Colombian Mild Arabicas group quota cut by 16,703 bags due to falling prices	-11,720[b]		
April 27	Colombian Mild Arabicas group quota cut by 152,104 bags due to group indicator price remaining below floor for 15 market days	-9,583		
June 19	Colombian Milds group quota cut by 11,720 bags as prices continue to decline	-11,720[b]		
July 20	Colombian Milds group waivers cut by 3,537 bags due to falling prices	-3,537[b]		
	Discrepancy	-5,097		
	Tanzania's Effective Quota for 1966/67		400,616	
1967/68:				
October 1	Tanzania's initial annual quota		440,635	435,458
November 30	Colombian Mild Arabicas group get 177,557 bags special export authorization	11,186		
April 13	Colombian Mild Arabicas group quota increased by 177,557 bags as the group's indicator price remains above the ceiling for 15 market days	11,186		

TABLE 18 (continued)

July 16	Colombian Mild Arabicas group quota increased by 177,557 bags due to group's indicator price remaining above the ceiling for 15 market days	11,186		
April-Sept.	Tanzania granted a waiver during the last 2 quarters	34,000		
	Discrepancy	-510		
	Tanzania's effective quota for 1967/68		507,683	
1968/69:				
October 1	Tanzania's initial annual quota		598,119	700,000
November 4	Colombian Mild Arabicas group quota increased by 219,425 bags	17,993		
September 15	Global quota raised by 334,000 bags as composite price remains above the ceiling for 15 market days	4,248		
	Discrepancy	18		
	Tanzania's effective quota for 1968/69		620,378	
1969/70:				
October 1	Tanzania's initial annual quota		572,120	700,000
October 22	Global annual quota increased by 500,000 bags as composite indicator price remains above the ceiling for 15 market days	6,360		
November 3	Colombian Mild Arabicas group quota increased by 192,395 bags due to group indicator price remaining above ceiling for 15 market days	15,776		
December 4	Colombian Mild Arabicas group quota increased by 192,395 bags due to group indicator price remaining above ceiling for 15 market days	15,776		

TABLE 18 (continued)

January 23	ICO increases quotas by 2,015,000 bags as prices continue to rise	25,631	
April 22	ICO releases 750,000 bags reserve quota for the year due to rising prices	9,540	
	Discrepancy	1,488	
	Tanzania's effective quota for 1969/70		646,691

Notes: Global basic quota for the 1962 ICA = 46.050 million bags and for the 1968 ICA = 55.041 million bags. Colombian Mild Arabica group (comprising of Colombia, Kenya and Tanzania) basic quotas are 6.964 million bags for the 1962 ICA and 8.56 million bags for the 1968 ICA. Therefore Tanzania's share of the global basic quota is 0.947 and 1.272 per cent for the 1962 and 1968 ICA, respectively. Tanzania's share of the Colombian Mild Arabicas group basic quota is 6.3 per cent for the 1962 ICA and 8.2 per cent for the 1968 ICA.

[a] Change in Tanzania's quota = change in group or global quota x Tanzania's share of the group or global quota.

[b] These quota reductions only involved special export authorizations of which Tanzania had the largest share of the three Colombian Mild Arabicas group members, hence the large losses of export entitlements by Tanzania.

Sources:

(i) TCB, Annual Report, (Moshi, Tanzania: TCB, several).

(ii) Paton, K. H., "World Coffee Chronology", Coffee Annual, several issues.

BIBLIOGRAPHY

Books, Papers and Articles

Baumol, William J. "Speculation, Profitability and Stability," Review of Economics and Statistics, Vol. XXXIX, (1957), pp. 263-71.

Behrman, Jere R. International Commodity Agreements: An Evaluation of UNCTAD Integrated Commodity Programme. Washington, D.C.: Overseas Development Council, October 1977.

Boschn, Gerd. "Consumption Stagnates Yet Coffee Still Most Favourable Beverage." Tea and Coffee Trade Journal, Vol. 146, #12, (December 1974), pp. 25-26.

Brook, E. M., Grilli, E. R., and Waelbroeck, J. Commodity Price Stabilization and the Developing Countries: The Problem of Choice, World Bank Staff Working Paper #262. Washington, D.C.: IBRD, July 1977.

Bryson, A. Reid. "Drought in Sahelia: Who is to Blame?" Ecologist, 3(10), pp. 366-371.

_____ and Murray, Thomas J. Climates of Hunger: Mankind and the World's Changing Weather. Madison, Wisconsin: University of Wisconsin Press, 1977.

_____, Ross, John E., Hougas, Robert W., and Engelbert, Lincoln E. Climatic Change and Agricultural Response: A Statement on Research and Technological Priorities Between Now and the Year 2000. Report to the National Science Foundation. IES Working Paper 20. Madison, Wisconsin: Institute of Environmental Studies, June 1974.

Cordell, Arthur T. "The Brazilian Soluble Coffee Problem: A Review." Quarterly Review of Economics and Business, Vol. 9, #1, (Spring 1969), pp. 29-38.

Cavallēri, Cesare. "Coffee Industry in Italy: Survival of the Fittest." Tea and Coffee Trade Journal, November 1977, pp. 16-17.

"Coffee Expansion Schemes Could Boost Output By 1980." Tea and Coffee Trade Journal, (June 1968), pp. 20-21.

Cooper, Richard N. and Lawrence, Robert Z., "The 1972-75 Commodity Boom," Brookings Papers on Economic Activity, (3; 1975), pp. 671-715.

Coppock, J. D. International Economic Instability. New York: McGraw-Hill, 1962.

Da Silva, Clovis. "Economic Impact of the International Coffee Agreement: The Agreement and Business Community." World Coffee and Tea, (November 1970).

De Vries, Jos. Structure and Prospects of the World Coffee Economy. IBRD Staff Working Paper #208. Washington, D.C. IBRD, June 1975.

Erb, G., and Schiavo-Campo, S. "Export Instability, Level of Development and Economic Size of Less Developed Countries." Oxford Bulletin of Economics and Statistics, (May 1970), pp. 575-580.

Fisher, Bart S. The International Coffee Agreement: A Study in Coffee Diplomacy. New York: Praeger, 1972.

Food and Agriculture Organization. The World Coffee Economy. Commodity Bulletin Series #33. Rome: FAO, 1961.

Ford, Derek J. "Commodity Market Modeling and the Simulation of Market Intervention: The Case of Coffee." Unpublished paper presented at the Ford Foundation Conference on Stabilizing World Commodity Markets, Arlie, Virginia (March 17-20, 1977).

Frank, Isaiah. "Toward a New Framework for International Commodity Policy." Finance and Development. International Monetary Fund and the World Bank; Volume 13, #2, (June 1976).

Frenchman, Michael. "Coffee: The Search for the Super Bean." The Times (London), June 8, 1977; p. 18.

Friedman, Milton. Essays in Positive Economics. Chicago: Chicago University Press, 1953.

Galloway, Thomas. "The International Coffee Agreement." Journal of World Trade Law, (1973),

Geer, Thomas. An Oligopoly: The World Coffee Economy and Stabilization Schemes. (New York: Dunellen, 1971).

Glezakos, Constantine. "Export Instability and Economic Growth: A Statistical Verification." Economic Development and Cultural Change, Vol. XXI, (July 1973), pp. 670-678.

Grubel, Herbert A. "Foreign Exchange Earnings and Price Stabilization Schemes." American Economic Review, Vol. LIV, (1964), pp. 378-385.

Gwyer, G. D. "Three International Commodity Agreements: The Experience of East Africa." Economic Development and Cultural Change, Vol. 21, #3, (April 1973), pp. 465-476.

Hawkins, R., Epstein, J., and Ganzales. "Stabilization of Export Receipts and Economic Development — International Commodity Agreements and Compensatory Financing Plans." The Bulletin, New York University, (November 1966).

Hayes, J. P. Terms of Trade Policy for Primary Commodities. Report to the Commonwealth Secretariat. London: Commonwealth Secretariat, 1975.

Helleiner, G. K. International Trade and Economic Development. Harmondsworth, England: Penguin Books, 1972.

Heller, H. R., "Optimal International Reserves." The Economic Journal, Vol. LXXVI, #302, (June 1966), pp. 296-311.

Hopp, Henry and Foote, Richard J. "A Statistical Analysis of Factors That Affect Prices of Coffee." Journal of Farm Economics, (August 1955), pp. 429-438.

Instituto Brasileiro do Cafe (IBC). Anuario Estatistico do Cafe. Rio de Janeiro: IBC, December 1977.

International Monetary Fund - World Bank. The Problem of Stabilization of Prices of Primary Products. Part I. Washington, D.C.: IMF - IBRD, 1969.

Johnson, Harry G. Economic Policies Toward Less Developed Countries. Washington, D.C.: The Brookings Institute, 1957.

Kenen, Peter B., and Voivodas, Constantine S. "Export-Instability and Economic Growth." Kyklos, Vol. XXV, (1972), pp. 792-804.

Knudsen, Odin, and Parnes, Andrew. Trade Instability and Economic Development. Lexington, Mass.: D.C. Heath, 1975.

Kravis, Irving B. "International Commodity Agreements to Promote Aid and Efficiency: The Case of Coffee." Canadian Journal of Economics, (May 1968), pp. 296-317.

Law, Alton D. International Commodity Agreements. Lexington: D. C. Heath, 1975.

MacBean, Alasdair I. Export Instability and Economic Development. Cambridge, Mass.: Harvard University Press, 1966.

Maidenberg, H. J. "There's Worse to Come in Coffee." New York Times, January 16, 1977.

Maitha, Joseph K. "A Supply Function for Kenya Coffee." East African Economic Review, Vol. I, #1, (June 1969), and Vol. II, #2, (1970).

Mbilinyi, S. M. "The Economics of Central Coffee Pulperies in Tanzania: A Preliminary Assessment." Economic Research Bureau, University of Dar-es-Salaam. ERB Paper 68.6, February 1968.

Mdalila, J. M. "The Problems of Demand and Supply of Tanzania Coffee." Unpublished paper submitted in partial fulfillment of the requirements of the Post-graduate Diploma in Agricultural Economics, Reading University, 1974.

Michalopoulos, Constantine, US Commodity Trade Policy and the Developing Countries. A.I.D. Bureau of Program and Policy Coordination, Discussion Paper #37. Washington, D.C.: Agency for International Development, January 1977.

_____, and Perez, L. L. "Commodity Trade Policy Initiatives and Issues." Paper presented at the Ford Foundation Conference on Stabilizing World Commodity Markets, Analysis, Practice and Policy, Airlie, Virginia, March 1977.

Mingst, Karen A. "The Process of International Policy Making in Regulation of Tropical Agriculture Products: Coffee and Cocoa." Unpublished Ph.D. Thesis, University of Wisconsin-Madison, 1974.

Missiaen, Edmund, and Ruff, Samuel O. Agricultural Development in Brazil: A Case Study of Sao Paulo. USDA Foreign Agriculture Economic Report #109. Washington, D.C.: USDA, FAS, June 1975.

Morgan, T. "Trends in Terms of Trade, and Their Repercussions on Primary Producers." Economic Development: Readings in Theory and Practice. Edited by T. Morgan and G. W. Betz. Belmont, California: Wadsworth Publishing Company, 1970.

Morrison, T., and Perez, L. Export Earnings Fluctuations and Economic Development: An Analysis of Compensatory Financing Schemes. A.I.D. Discussion Paper #32. Washington,D.C.: A.I.D. Bureau of Program and Policy, September 1975.

Msuya, M. "Export Taxes and Economic Development: The Tanzania Coffee Export Tax as an Example." Paper prepared for course in public finance, University of Wisconsin-Madison, December 15, 1975.

Mueller, Charles C. "The Impact of the International Coffee Agreement on the Price of Coffee." Revista Brasileira de Economia, Vol. 25, #3 (July/September 1971), pp.149-66.

Neter, John, and Wasserman, William. Applied Linear Statistical Models. Homewood, Illinois: Richard D. Irwin, 1974.

Nurkese, Ragnar. "Trade Fluctuations and Buffer Price Policies of Low-Income Countries." Kyklos, Vol. XI, (1958).

Nzekio, Ernest P. "Stability, Export Taxation, and Economic Development: The Role of Cocoa Marketing Boards and Cocoa Stabilization Funds in Nigeria, Ghana, Ivory Coast, and Cameroun." Unpublished Ph.D.thesis, University of Wisconsin-Madison, 1973.

Parikh, A. "United States, European and World Demand Functions for Coffee." American Journal of Agricultural Economics, (1973), pp. 490-94.

Pan-American Coffee Bureau. Annual Coffee Statistics. New York: Pan-American Coffee Bureau, several issues.

_____, Coffee Drinking in the United States, Winter 1976. Pan-American Coffee Bureau, 1976.

Paton, K. H. "World Coffee Chronology." Coffee Annual. New York: K. H. Paton, several issues.

Pincus, John A., ed. Reshaping the World Economy. Englewood Cliff, N.J.: Prentice-Hall, 1968.

Porter, Richard C., and Staelin, Charles P., "The Rediscovery of Exports by the Third World." Foreign Trade Review, Vol. VI, #4 (January-March 1972),

Powelson, J. P. "The Strange Persistance of the 'Term of Trade.'" Inter-American Economic Affairs, (1977), pp. 17-28.

Rourk, J. Phillip. Coffee Production in Africa. USDA, FAS M-266. Washington, D.C.: USDA Foreign Agricultural Service, September 1975.

Rourke, Eugene Blair. "Causes and Predictability of Annual Changes in Supplies and Prices of Coffee." Unpublished Ph.D. thesis, Stanford University, 1969.

Rowe, J. W. F. The World's Coffee. London: Her Majesty's Stationary Office, 1963.

Rutahakana, L. L., Rweyemamu, J. A., and Maxwell, W. C. M., An Analysis of the Tanzania Coffee Industry and a Proposed National Coffee Improvement Plan 1975-1980. Volume I. Moshi, Tanzania: Tanganyika Coffee Board, January 4, 1975.

Rweyemamu, Juvenal A. "Coffee in the Tanzanian Economy 1962-1972." Unpublished study submitted in partial fulfillment of the requirements of the M.A. in Economics, University of Dar-es-Salaam, June 1974.

Schuh, George E. "The Modernization of Brazilian Agriculture." Mimeo, prepared for the US National Academy of Science, June 1973.

Singh, Shamsher. International Coffee Agreement, 1968: Background and Analysis. World Bank Report EC 165. Washington, D.C.: World Bank, August 1968.

_____. "The International Dialogue on Commodities." Reprint from Resources Policy. Washington, D.C.: World Bank, June 1976.

_____, de Vries, Jos, Hulley, John, C. L., and Yeung, Patrick. Coffee, Tea, and Cocoa: Market Prospects and Development Lending. Baltimore: John Hopkins University Press, 1977.

Stern, Robert M. "International Compensation for Fluctuations in Commodity Trade." Quarterly Journal of Economics, Vol. LXXVII, (1963), pp. 258-273.

Streeten, Paul, and Elson, Diane. Diversification and Development: The Case of Coffee. New York: Praeger, 1971.

Tanganyika Coffee Board. Coffees of Tanzania. Moshi, Tanzania: Tanganyika Coffee Board, 1974.

Tchan, Rudolf. "Instant Profits for Coffee." Business Week. (May 1, 1977), p. 40.

Tisdall, Patricia. "Instant Coffee Prices in the Melting Pot." The Times (London), August 1, 1977, p. 17.

Tomizawa, Tazo. "Bitter-Sweet Consumption Pattern." Tea and Coffee Trade Journal, (June 1978), pp. 14-15.

UNCTAD/GATT, International Trade Center. Industrial Coffee on Twenty One European Markets. Geneva: UNCTAD/GATT, 1969.

_____. The Market for Soluble Coffee in Canada and Japan. Geneva: UNCTAD/GATT, 1971.

UN Department of Economic Affairs. Instability in Exports of Underdeveloped Countries. New York: United Nations, Department of Economic Affairs, 1952.

US Department of Agriculture, Foreign Agricultural Service. Foreign Agriculture Circular: Coffee. USDA FCOF 4-78. Washington, D.C.: USDA, FAS, October 1978.

Voivodas, Constantine S. "The Effect of Foreign Exchange Instability on Growth." Review of Economics and Statistics, Vol. LVI, (1974), pp. 410-412.

Wallace, Jackson. "Effect of Frost on Brazilian Coffee a Matter of Guesswork." The Times (London). (August 21, 1978), p. 16.

Woodland, John. "Coffee: London Talks Face Blend of Troubles." The Times (London). (September 16, 1974), p. 12.

Yogerson, Vernon. "The International Coffee Agreement: Prospects and Retrospect." Development and Change. #7 (1976), pp. 207-221.

Public Documents and Statements

Coffee Authority of Tanzania. Coffee Expansion Programme, 1978-1982. Volume 1, Programme Analysis. Moshi, Tanzania: Coffee Authority of Tanzania, February 1978.

_____/Market Development Bureau. Proposals for a National Coffee Expansion Programme. Volume 1, MDB R4/77. Dar-es-Salaam: Market Development Bureau, Ministry of Agriculture, June 1977.

Comptroller General of the United States. Coffee Production and Marketing Systems. Report to the Congress of the United States. Washington, D.C.: General Accounting Office, October 1977.

International Coffee Organization (ICO). International Coffee Agreement 1976. London: International Coffee Organization, January 1976.

Malecela, John S., Minister of Agriculture; as Secretary at Tanzania's Permanent Mission at the United Nations, he participated in the 1962 UN Coffee Conference in New York. Dar-es-Salaam, March 20, 1978.

Mungai, Joseph J., General Manager, Sugar Development Corporation; previously Minister of Agriculture. Dar-es-Salaam, March 21, 1978.

Bryceson, Dereck., Managing Director, Tanzania Wildlife Corporation; previously as Minister of Agriculture, he participated in the 1962 UN Coffee Conference in New York. Dar-es-Salaam, May 19, 1978.

Rutahakana, Lawrence L., General Manager, Coffee Authority of Tanzania. Chairman of the International Coffee Council 1977/78. Moshi, May 26 and 27, 1978.

Rweyemamu, Juvenal A., Economist/Statistician. Coffee Authority of Tanzania. Moshi, June 5, 1978.

Msuya, Cleopa D., Minister for Industries; previously Minister of Finance, Dar-es-Salaam, July 2, 1978.

Fazel, Hassan, Statistician, President's Economic Unit, State House, Dar-es-Salaam, July 12, 1978.

Hayes, J. P., Chief Economist, Foreign and Commonwealth Office; previously with the Commonwealth Secretariat Commodities Section, London, July 20, 1978.

Knox, Peter, Secretariat Officer, International Coffee Organization. London, July 21, 1978.

Loudon, T., Deputy Executive Director of the International Coffee Organization; he was the chief negotiator for East Africa (Kenya, Uganda, and Tanzania) in the Coffee Study Group in Washington, D.C. and in the 1962 UN Coffee Conference he was the chief advisor to the East African delegations. London, July 26 and 27, 1978.

Bryson, Reid A., Director, Institute of Environmental Studies, University of Wisconsin-Madison, Madison, October 16, 1978.