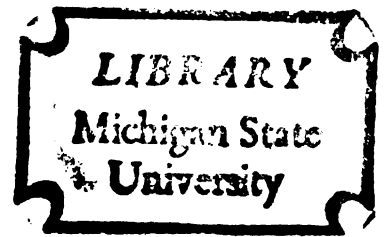


COST-BENEFIT ANALYSIS OF
EXPORTING WORKERS:
THE TUNISIAN CASE

Dissertation for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
MHAMED FAYCAL LAKHOUA
1976



This is to certify that the
thesis entitled
COST-BENEFIT ANALYSIS OF
EXPORTING WORKERS:
THE TUNISIAN CASE

presented by

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has been accepted towards fulfillment
of the requirements for

Doctor degree in Philosophy

A handwritten signature in cursive script, reading "Habib Kanaeffan", written over a horizontal line.

Major professor

Date October 28, 1976

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ABSTRACT

COST-BENEFIT ANALYSIS OF EXPORTING WORKERS:
THE TUNISIAN CASE

By

Mhamed Fayçal Lakhoua

Although Tunisian migration to western Europe has been substantial for nearly a decade, surprisingly little is known about it. This assembles the available data on this migration with a view to determining the socio-economic characteristics of the migrants as compared to the indigenous Tunisian labor force. It describes how the system of temporarily recruited migrant labor operates in Tunisia. Further, to understand the economic rationale of the migration process, empirical evidence is also developed concerning the benefits and costs to the migrant workers and their country of origin.

Rather than just looking at the gross outflow of workers and inflow of repatriated earnings, we use a widely accepted technique for measuring the economic returns of migration for two decision-makers: the individual and the society. The cost-benefit technique takes into account a number of considerations overlooked by previous studies of investment in human capital. The cost-benefit model

concentrates on the income effect of migration and provides a framework for an economic evaluation. The study tries to meet the usual objections raised to applying a cost-benefit approach to expenditure on a social product such as migration. Conceptually, we believe that these objections have been met.

The study then presents computations of cost-benefit ratios for Tunisian migrants who go to western Europe and Libya. The main results of the benefit-cost ratios have been incorporated and implications for policy are discussed in the text. The results are of relevance not just to the Tunisian situation but to the more general issues of the benefits and costs which a developing country must evaluate in deciding on whether to encourage or discourage migration.

COST-BENEFIT ANALYSIS OF EXPORTING WORKERS:
THE TUNISIAN CASE

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Mhamed Fayçal Lakhoua

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements for
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

1976

To the memory of my father

To Belhassen Nizar

ACKNOWLEDGEMENTS

It would have been impossible to conduct the study reported in this dissertation without the assistance of a few individuals. Our first indebtedness goes to Professor Subbiah Kannappan. Dr. Kannappan headed my doctoral dissertation committee. His constant inspiration provided the continuous support needed in an undertaking so methodologically complex.

Special thanks must go to Professor W. Paul Strassmann who encouraged me and bolstered my morale when it needed a lift.

I owe a special gratitude to Professor John M. Hunter. He showed toward me a tolerance, an understanding, and a patience which I shall not forget.

I wish to thank Dr. Harold Lubell, from the International Labor Organization, for his interest in the study and for his willingness to serve as a member of my dissertation committee.

I also wish to thank the U.S. Agency for International Development who sponsored my course work at Michigan State University and provided financial assistance to help this study to completion.

To my wife, Khaoula, my thanks beyond all others.
She has shown courage, tenacity and at the same time, love
and solicitude. I could not have done without her.

TABLE OF CONTENTS

| | Page |
|--|------|
| ACKNOWLEDGEMENTS | ii |
| LIST OF TABLES | |
| LIST OF FIGURES | |
| Chapter | |
| I. INTRODUCTION | 1 |
| II. THE TUNISIAN BACKGROUND TO LABOR MIGRATION | 6 |
| The Labor Supply | 8 |
| The Labor Demand | 14 |
| Welfare Measures: The Public Works Program | 34 |
| Planning and the Employment Expansion | 39 |
| Conclusion | 49 |
| III. THE FLOWS OF MIGRANT WORKERS | 50 |
| The European Labor Market | 51 |
| The Tunisian Migrant Workers: Numbers and Characteristics | 54 |
| The Push and Pull Factors | 76 |
| IV. THE COST-BENEFIT MODEL | 88 |
| Review of Literature | 89 |
| Conceptual Issues in Cost-Benefit Analysis | 97 |
| The Cost-Benefit Model | 113 |
| V. NUMERICAL RESULTS AND OTHER EFFECTS OF MIGRATION ON ECONOMIC VARIABLES | 141 |
| Numerical Results | 141 |
| Some Nonquantifiable Effects of International Migration | 160 |
| The Future of the Migrant Labor System | 166 |
| Appendix to Chapter V | 174 |

| Chapter | Page |
|--|------|
| VI. SUMMARY AND CONCLUSIONS | 214 |
| Appendices | |
| 1. A Guide to the Source Material on the Statistics of Tunisian Migration | 221 |
| 2. Statistical Data | 225 |
| BIBLIOGRAPHY | 231 |

LIST OF TABLES

| Table | Page |
|---|------|
| 2.1 Tunisian Population | 9 |
| 2.2 Birth and Mortality Rates, 1956, 1960, 1970 . . . | 11 |
| 2.3 Broad Age Structure: 1956, 1966, 1972 . . . | 12 |
| 2.4 Age/Sex Specific Labor Force, Participation Rates, 1956, 1966 | 13 |
| 2.5 Population Actually Employed and the Share of the GDP by Major Economic Sectors: 1956, 1966, 1972 | 17 |
| 2.6 Distribution by Status and Occupational Groups, 1966 | 19 |
| 2.7 Distribution of Work Force and Wages in the Industrial and Services Sectors by Skills . . . | 20 |
| 2.8 Rates of Visible Unemployment, 1966 | 23 |
| 2.9 Unemployment Rates, 1972 | 28 |
| 2.10 Rural-Urban Unemployment Rates, 1966 | 30 |
| 2.11 Rates of Unemployment by Sex, Age and Level of Education in Tunis (Percentage) | 32 |
| 2.12 Work Created by CLCSD Work in Tunisia, 1958-1971 | 36 |
| 2.13 Regional Unemployment Rates and Distribution of CLCSD Funds | 38 |
| 2.14 Compound Growth Rates of Economic Sectors, 1961-1971 (Percentage) | 43 |
| 3.1 Foreign Workers Admitted in the European Countries, 1960-1969 (in thousands) | 55 |

| Table | Page |
|--|------|
| 3.2 Emigration by Country of Destination, 1962, 1973 | 57 |
| 3.3 Age of Emigrants (Percentage) | 62 |
| 3.4 Age of Emigrants by Country of Destination, 1969-1972 (Percentage) | 64 |
| 3.5 Percentage of Single Migrants | 65 |
| 3.6 Ratio of Unskilled to Skilled Workers for Industrial Sectors in Tunisia and for the Emigrants to France, 1969-1971 | 67 |
| 3.7 Nature of the Migrant Contract, 1971 (Percentage) | 71 |
| 3.8 Trade Balance, Import of Machinery and Equipment, Debt Servicing Bill and Remittances, 1960-1972 (Million of Tunisian Dinars) | 73 |
| 3.9 Remittances by Regions, Amount, Average and Per Capita Remittance | 75 |
| 3.10 Migrant Workers by Area of Origin, 1966-1973 | 76 |
| 3.11 Regional Distribution of Employment and Male Labor Force (15-64 Years Cohort) | |
| 3.12 Monthly Average Wages in France and Tunisia and Four Occupational Categories and Twelve Sectors for 1972 (in French Francs) | 85 |
| 4.1 Interest Rates in Tunisia (Percentage) | 102 |
| 4.2 Values of the Decay Factor | 131 |
| 5.1 Averages and Standard Deviations of Private Benefit-Cost Ratios for the Unskilled Workers | 144 |
| 5.2 Averages and Standard Deviations of Private Benefit-Cost Ratios for Semi-Skilled Workers | 145 |
| 5.3 Averages and Standard Deviations of Private Benefit-Cost Ratios for Skilled Workers | 146 |

7.

5.

5.

5.

5.

5.

5.9

15.

15.

15.

15.

15.5

15.6

15.7

15.8

15.9

15.10

| Table | | Page |
|-------|---|------|
| 5.4 | Averages and Standard Deviations of Private Benefit-Cost Ratios for Technicians . . . | 147 |
| 5.5 | Averages and Standard Deviations of Social Benefit-Cost Ratios for Unskilled Workers . . | 153 |
| 5.6 | Averages and Standard Deviations of Social Benefit-Cost Ratios for Semi-Skilled Workers | 154 |
| 5.7 | Averages and Standard Deviations of Social Benefit-Cost Ratios for Skilled Workers . . | 155 |
| 5.8 | Averages and Standard Deviations of Social Benefit-Cost Ratios for Technicians . . . | 156 |
| 5.9 | Assumed Evolution of Employment (in thousands) | 172 |
| A5.1 | Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = 0$ | 174 |
| A5.2 | Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = 0$ | 175 |
| A5.3 | Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = 0$ | 176 |
| A5.4 | Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = 0$ | 177 |
| A5.5 | Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = 0$ | 178 |
| A5.6 | Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = 0$ | 179 |
| A5.7 | Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 12.65$; $E_0 = 0$ | 180 |
| A5.8 | Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = 0$ | 181 |
| A5.9 | Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = .63$ | 182 |
| A5.10 | Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = .63$ | 183 |

| Table | Page |
|--|------|
| A5.11 Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = .63$ | 184 |
| A5.12 Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = .63$ | 185 |
| A5.13 Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = .63$ | 186 |
| A5.14 Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = .63$ | 187 |
| A5.15 Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 12.65$; $E_0 = .63$ | 188 |
| A5.16 Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = .63$ | 189 |
| A5.17 Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = 1$ | 190 |
| A5.18 Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = 1$ | 191 |
| A5.19 Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = 1$ | 192 |
| A5.20 Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = 1$ | 193 |
| A5.21 Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = 1$ | 194 |
| A5.22 Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = 1$ | 195 |
| A5.23 Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 12.65$; $E_0 = 1$ | 196 |
| A5.24 Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = 1$ | 197 |
| A5.25 Social Benefit-Cost Ratios, Case: Married Unskilled Workers. Not Receiving Any Form of Transfer Payments | 198 |
| A5.26 Social Benefit-Cost Ratios, Case: Married Semi-Skilled Workers. Educational Costs not Included | 199 |

| Table | | Page |
|-------|---|------|
| A5.27 | Social Benefit-Cost Ratios, Case: Married Skilled Workers. Educational Costs not Included | 200 |
| A5.28 | Social Benefit-Cost Ratios, Case: Married Technicians. Educational Costs not Included | 201 |
| A5.29 | Social Benefit-Cost Ratios, Case: Bachelor Unskilled Workers. Not Receiving any form of Transfer Payments | 202 |
| A5.30 | Social Benefit-Cost Ratios, Case: Bachelor Semi-Skilled Workers. Educational Cost not Included | 203 |
| A5.31 | Social Benefit-Cost Ratios, Case: Bachelor Skilled Workers. Educational Costs not Included | 204 |
| A5.32 | Social Benefit-Cost Ratios, Case: Bachelor Technicians. Educational Costs not Included | 205 |
| A5.33 | Social Benefit-Cost Ratios, Case: Married Unskilled Workers. Receiving Transfer Payments | 206 |
| A5.34 | Social Benefit-Cost Ratios, Case: Married Semi-Skilled Workers. Educational Costs Included | 207 |
| A5.35 | Social Benefit-Cost Ratios, Case: Married Skilled Workers. Educational Costs Included | 208 |
| A5.36 | Social Benefit-Cost Ratios, Case: Married Technicians. Educational Costs Included | 209 |
| A5.37 | Social Benefit-Cost Ratios, Case: Bachelor Unskilled. Receiving Transfer Payments | 210 |
| A5.38 | Social Benefit-Cost Ratios, Case: Semi-Skilled Workers. Educational Costs Included | 211 |
| A5.39 | Social Benefit-Cost Ratios, Case: Bachelor Skilled Workers. Educational Costs Included | 212 |

| Table | Page |
|--|------|
| A5.40 Social Benefit-Cost Ratios, Case: Bachelor Technicians. Educational Costs Included . . | 213 |
| B.2.1. Average Real Wages in Tunisia, 1961-1971 . . | 229 |

Fig

5.1

5.2

LIST OF FIGURES

| Figure | | Page |
|--------|---|------|
| 5.1 | Variants of Private Benefits Developed in the Private Cost-Benefit Model | 143 |
| 5.2 | Variants of Social Benefits Developed in the Social Cost-Benefit Model | 152 |

CHAPTER I

INTRODUCTION

In the late 1950s some of the developed Western European economies approached full employment. The governments of these countries sought to alleviate certain labor shortages by tapping the potential labor markets of the Less Developed Countries (LDCs). Since widespread unemployment or disguised employment are characteristic features of the LDCs, the agreements facilitating the international movement of labor are mutually advantageous. This setting is relevant to our study of Tunisia. After 1965, the number of Tunisian emigrants to Western Europe (particularly to France) and to Libya began to rise sharply.

The merits and shortcomings of an open migration policy have been argued in trade-off terms. On the one hand, Tunisia is a developing nation with insufficient capital to employ all its labor surplus. Its workers, by taking advantage of prevailing income differentials could be significantly better off by emigrating. Migrants' remittances would reduce balance-of-payments pressure and allow the country to import more goods, capital, and

services than it would otherwise have done. On the other hand, migration may be of sufficient magnitude and skill composition to alter costs of production, investment, and the demographic characteristics of the nation. Little systematic economic appraisal has been made of the current Tunisian policy.

Most of the extensive research on migration is concerned with receiving countries. This investigation is essentially a case study of Tunisia's role in supplying migrant workers to Western Europe and Libya and its effects. Nonetheless, the results are relevant to other countries. The development problem with which this study is concerned about exists in Portugal, Spain, Turkey, Greece, Algeria, and Morocco, and to the more general question of what sort of effects the decision to export labor may have on LDCs.

By 1972 the number of persons emigrating from Tunisia was 12.9 percent of the domestic labor force; the value of migrants' remittances had risen to 41.2 million Tunisian dinars (T.D.) (50 percent of the trade deficit).¹ But rather than look at the gross outflow of workers and inflow of repatriated earnings, this study presents a cost-benefit approach to migration.

Recent years have witnessed intensive concern with and research on investment in human capital, much of it

¹Note: One Tunisian dinar is equal approximately to 2.20 U.S. dollars.

contributed or stimulated by Theodore W. Schultz. By concentrating on the income effects of migration, this study presents empirical results of a cost-benefit study concerning migrant workers who go abroad. The main focus is on an economic rationale for migration behavior. We have sought to derive from the data collected, several kinds of private and social benefit-cost ratios adjusted for differences in socioeconomic background. Throughout the study, investment is understood to mean expenditures, whether by individuals or by the society, and it is not restricted to capital or development expenditure.

To understand the growth of migration and the development of its institutional framework, one must have some basic knowledge of the historical and institutional context. A general description is given in Chapter II of some Tunisian economic factors which bear on the migration process.

Chapter III assembles the available data on Tunisian migration to construct a detailed picture of the socioeconomic characteristics of the workers who have left and the changes that have taken place since 1960. The outline deals with the Tunisian experience from 1960 to 1973. Initially, it describes how the system of temporarily recruited migrant labor operates. The sources used include not only published studies but also a considerable amount of unpublished material.

Chapter IV extends a widely accepted technique for measuring the economic returns to investment in international migration. After a brief review of the literature, emphasis is placed on the economic analysis of some relevant conceptual issues. Section III of Chapter IV is devoted to a determination of benefits and costs. Benefit-cost ratios will be calculated for the individual worker and for society. The most important research questions will be:

1. Do the benefits, when weighed against the costs, favor migration as an investment for the individual?

2. Do the benefits, when weighed against the costs, justify migration as an investment for society?

3. How would the benefit-cost ratios change if some alternative methods were adopted, such as an alternative measure of the length of stay, various discount rates, socioeconomic status, the economic sector of origin and so forth?

4. According to one view, migrant workers' educational costs can be regarded as an investment by the society in human capital, the return on which is obtained when the worker repatriates savings and remittances from abroad. How will this analysis affect the social benefit-cost ratios?

Chapter V presents the numerical results of the case study and discusses some of the other effects of international migration that have an impact on the economic position of the labor exporting country. It ends

with a discussion of the prospects for migration. The analysis is not necessarily only quantitative. It is also intended to clarify the issues involved going beyond what can be accomplished by assigning specific magnitude to the demand and supply factors.

Chapter VI reviews the results of the case study and evaluates the experience gained from a practical point of view. The usefulness of the study's techniques are discussed and recommendations are made arising out of the findings.

CHAPTER II

THE TUNISIAN BACKGROUND TO LABOR MIGRATION

In 1972 Tunisia had 5.5 million inhabitants and an area of 160,000 square kilometers, making it the smallest North African country. It is also the least endowed with natural resources.

In the early 1880s, when Tunisia became a colony of France, nine-tenths of the Tunisian population was rural and depended directly on agriculture for a living. Only a very small percentage of the inhabitants engaged in mining and craftwork.

From 1881 to 1911, the average annual rate of increase of the Tunisian population was 0.46 percent; from 1911 to 1921 it was 0.78 percent; and from 1921 to 1931 it was 1.3 percent. Since 1936 the average annual rate of growth has approached 1.9 percent, and in 1972 the estimate was 2.7 percent.

There are no estimates of the Gross Domestic Product (GDP) for these periods. We may characterize the Tunisian economy from 1881 to 1931 as backward, as defined by Harvey Leibenstein (1956):

An economy whose equilibrium state possesses a degree of quasi-stability with respect to per capita income.

With the French colonization, the European population increased from 18,914 persons in 1881, to 148,476 in 1911, and to 195,293 persons in 1931. The settlement of these Europeans led to a seizure of the rich northern lands, which had two results for the employed labor force. First, a landless and free agricultural work force emerged, no longer tied to the villages and thus available for industrial employment. As their holdings became smaller, an increasing proportion of farmers could no longer support themselves and became part of the rural proletariat. Second, the expanding system of transportation opened the hinterland to trade, and the villages became less self-sufficient. Foreign competition in clothing and mechanical products began to make itself felt. The growing middle class of civil servants, with imitative tastes for imported goods, increased the displacement of native craftsmen. These constituted another source of the increasing number of proletarians available for existing industrial and mining jobs.

Unemployment increased and became a major concern for the rulers. Unemployment in this case was partly due to a breakdown of the traditional self-sufficient social system before it was replaced by another. With the break-up of the rural economy, the problem of unemployment, whether visible or disguised, has become serious. In view

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of its extent, structural nature, and social, economic, and political consequences, a partial alleviation of the problem is now being recognized as the basic condition for development. This chapter will deal with some aspects of the employment and unemployment problems in Tunisia by focusing attention on the following points:

1. the labor supply;
2. the labor demand;
3. the "welfare measures" to alleviate unemployment; and
4. the economic planning and the employment creation.

We should note that the available data concerning employment, unemployment, sectoral distribution of employment, occupational distribution, and the wage structure leave a great deal to be desired for any but the broadest summary judgments. Nevertheless, the available evidence is adequate to support the broad propositions and conclusions which will be developed in this chapter.

I. The Labor Supply

Between 1956 and 1966, the two census years, the population of Tunisia expanded from 3,692,000 persons to 4,466,000, or by an estimated average annual rate of growth of 2.6 percent. For the period 1966-1972, the average annual rate of population growth was 2.7 percent (Table 2.1). This high rate of increase was caused by a

TABLE 2.1.--Tunisian Population.

| Years | Population (000) | Change (000) | Average Annual Rate of Growth (percentage) |
|-------|---------------------|-----------------|---|
| 1881 | 1,519 | ---- | ---- |
| 1911 | 1,740 | 221 | 0.46 |
| 1921 | 1,874 | 134 | 0.75 |
| 1931 | 2,142 | 268 | 1.35 |
| 1936 | 2,325 | 183 | 1.83 |
| 1946 | 2,800 | 475 | 1.88 |
| 1956 | 3,602 | 642 | 2.09 |
| 1966 | 4,466 | 1,024 | 2.60 |
| 1972 | 5,310 | 844 | 2.70 |

*The foreign population (Muslims and Europeans) is not included.

Sources: For the period 1881-1946, LEPIDI, Jean, La Population de la Tunisie. Tunis: 1955, pp. 20; SEPEN, Recensement de la Population et des logements. Tunis 1956 and Tunis 1966; 1972, Ministere du Plan, The Fourth Development Plan (1973-1976), Tunis 1973, pp. 180.

steadily declining mortality rate combined with a high fertility rate, as Table 2.2 indicates.

In the capital, Tunis, as reported by Mahmoud Seklani (1967), the infant death rate dropped from 202 per thousand in 1940 to 90 per thousand in 1960. In Tunisia as a whole, the mortality rate fell considerably owing to the improvement of health services and the opening of new road networks. These helped to eliminate epidemics and to decrease the impact of famines, starvation, and so forth.

The rapid population increase did not affect the Tunisian labor market in full measure for several reasons.

First, as typically occurs when population expands rapidly, there was a relatively greater rate of population growth in the age groups below the labor force age (under 15 years). (See Table 2.3.)

Second, behavioral changes, particularly of rural people due in part to legislation, led to increased school attendance. Therefore, the labor force participation rate for the age group 15-19, between 1956 and 1966, fell from 62.0 to 51.4 percent for the male population.¹ (See Table 2.4.) But female labor force participation rates for all age groups increased slightly. The total labor force participation rates for those between 60 and 64

¹Age-specific participation rate is defined as the ratio of the labor force in that age group to the population in that age group.

TABLE 2.2.--Birth and Mortality Rates, 1956, 1960, 1970.

| | 1956 | 1960 | 1970 |
|----------------------------|------|------|------|
| Birth Rate (per 1,000) | 46.4 | 46 | 38.8 |
| Mortality Rate (per 1,000) | 20.2 | 19 | 12 |

Source: Mahmond Seklani, La Mortalité et le Cout de la Sante' en Tunisie. Cahiers du CERES, June 1967, p. 35.

TABLE 2.3.--Broad Age Structure: 1956, 1966, 1972.

| Age Group (years) | 1956 | | 1966 | | 1972 | |
|--|-------|-------|-------|-------|-------|-------|
| | (000) | % | (000) | % | (000) | % |
| 0-14 | 1,610 | 41.0 | 2,099 | 46.3 | 2,386 | 44.9 |
| 15-64 | 2,153 | 54.5 | 2,272 | 50.1 | 2,710 | 51.0 |
| 65 & Over | 179 | 4.5 | 161 | 3.6 | 214 | 4.0 |
| Total | 3,943 | 100.0 | 4,533 | 100.0 | 5,310 | 100.0 |
| Dependency Coefficient ¹ | 50.6 | | 50.1 | | 51.1 | |

¹The dependency coefficient is defined as the ratio of the population aged between 15 to 64 years over the total population.

Sources: 1956 and 1966 Censuses, op. cit.; 1972, Ministère du Plan, Fourth Development Plan (1973-1976), Tunis 1973, pp. 180-200.

TABLE 2.4.--Age/Sex Specific Labor Force, Participation
Rates 1956, 1966 (Percentage).

| Age Group (years) | Males | | Females | | Total | |
|----------------------|-------|------|---------|------|-------|------|
| | 1956 | 1966 | 1956 | 1966 | 1956 | 1966 |
| 15-19 | 62.0 | 51.4 | 4.1 | 8.8 | 33.2 | 30.3 |
| 20-24 | 71.1 | 91.0 | 4.0 | 8.7 | 40.1 | 48.6 |
| 25-29 | 89.7 | 95.0 | 4.2 | 4.6 | 47.0 | 50.2 |
| 60-64 | 55.2 | 74.2 | 2.2 | 3.4 | 27.0 | 40.8 |
| 65 & Over | 69.7 | 46.6 | 4.2 | 2.0 | 30.5 | 26.0 |

Source: 1956 and 1966 Censuses, op. cit.

increased slightly, while that for the group 65 years and over showed a slight decline because of the welfare measures that were undertaken (retirement benefits, and so forth).

Third, there was only a small increase of 119,861 persons in the labor force between 1956 and 1966 among those 15 years and over due to emigration (in 1966 70,000 persons were estimated to have emigrated)² and to the departure of foreign farm-born settlers after Independence in 1956.

II. The Labor Demand

The problems posed by concepts, classifications, and measurements of the labor force are particularly complex in Tunisia. This is due to (1) the lack of reliable data and the limited scope and coverage of information and statistics on employment and unemployment; (2) changes in concepts and measurements from one census to another and an underlying framework more suited to analyzing the unemployment experience of industrial countries; (3) the limited time series, as data collection started only recently; and (4) the absence of regular and meaningful statistics of unemployed persons, because there is no provision for the registration of the unemployment or for unemployment benefits.

²I.S.E.A. Centre d'Afrique du Nord. Perspectives Sectorielles et Globales du Niveau de l'Emploi en 1980. Tunis: Novembre 1968.

II.1. The Sectoral Distribution of Employment

The total labor force is defined as the total of employed and unemployed persons. Not included are students, retired persons, and those wholly dependent upon others. Only 20 percent of the total female population aged 15 years and over is counted. The official calculations are based on the censuses of 1956 and 1966 and on sample surveys and investigations for 1972. These yield data shown in Table 2.5 of the proportion of the labor force to the country's total population, estimated at 5.31 million in 1972, as about 26 percent of the total.

Rapid economic growth during the last fifteen years has been accompanied by a fundamental change in the structure of the economy and the pattern of sectoral output and employment. The manufacturing, construction, and service sectors provided a much higher level of employment opportunities in 1972 than in 1956. The growth of industries over the last fifteen years almost doubled industrial employment.

In 1972, over 57 percent of the total visible employed labor force was engaged in agriculture, contributing about 18 percent of the GDP. Less than 13 percent of the visible employed labor force was in the manufacturing sector and contributed almost 22 percent of GDP. Agricultural employment declined from 955,000 in 1956 to 800,000 in 1972. The ratio of agricultural to total

employment has declined considerably, from 73.6 percent in 1956 to about 57.8 percent in 1972. The importance of agricultural employment must be kept in mind in assessing the nature of employment and unemployment.

II.2. The Occupational Distribution

Data about the occupational distribution of the active population are not very meaningful in LDCs. The labor force is predominantly unskilled, and occupational specialization is less marked. The problem of labor mobility also should be taken into account, as a large number of people move easily from one type of activity to another. Outside the high-wage formal sector it may be difficult to define employment relationships with any precision. Much employment, especially of physical labor, is casual, with no identifiable single employer. Much economic activity also may involve switching between wage employment and other kinds of economic activity because only a low level of skill is required in these occupations. Many activities are "open sectors" in the sense that, with little skill and little capital, newcomers find entry easy. This pattern of relying heavily on casual and temporary labor appears to be influenced by considerations of flexibility to meet variations in production schedules. It may also be a convenient and economical way of avoiding more expensive "permanent" job commitments, particularly if some

TABLE 2.5.--Population Actually Employed and the Share of the GDP by Major Economic Sectors: 1956, 1966, 1972.

| Sectors and Occupations | 1956 | | | 1966 | | | 1972 | | |
|-----------------------------|-------------------|------------------|----------|-------------------|------------------|----------|-------------------|------------------|----------|
| | Labor Force (000) | % of Labor Force | % of GDP | Labor Force (000) | % of Labor Force | % of GDP | Labor Force (000) | % of Labor Force | % of GDP |
| Agriculture | 955 | 73.6 | 33.0 | 844 | 62.8 | 17.4 | 800 | 57.8 | 18.3 |
| Mining | 17 | 1.3 | 4.0 | 19 | 1.4 | 2.6 | 19 | 1.4 | 1.4 |
| Manufacturing & Handicrafts | 93 | 7.1 | 12.0 | 122 | 9.1 | 17.7 | 177.3 | 12.8 | 22.2 |
| Construction | 33 | 2.5 | 10.5 | 67 | 5.0 | 9.7 | 59 | 4.2 | 7.5 |
| Transportation | 31 | 2.4 | 7.5 | 45 | 3.2 | 9.6 | 42.9 | 3 | 7.4 |
| Other Services | 166.8 | 13.1 | 13.0 | 249 | 18.5 | 43.0 | 288.5 | 20.8 | 43.2 |
| Total | 1,295.8 | 100.0 | 100.0 | 1,346.4 | 100.0 | 100.0 | 1,386.7 | 100.0 | 100.0 |

Sources: 1956 and 1966 Labor Force, the 1956 and 1966 Censuses, op. cit.; 1972 Labor Force, Ministère du Plan, The Fourth Development Plan, 1973-1976, Tunis 1973, pp. 180-200; 1956 GDP Data: The Decennial Perspectives (1962-1971), Tunis 1962; 1966 GDP Data: Statistical Tables 1960-1971, Tunis 1973; 1972 GDP Data: Tunisian Fourth Development Plan, pp. 40-60.

stable associations can be developed with the nonpermanent work force.³

The figures compiled in Table 2.6 show the importance of unskilled workers in 1966 which constituted almost 77 per-cent (by adding items 5, 8, and 10) of the total labor force.

Table 2.7 indicates that for 1972, in the industrial sectors, 48.5 percent of the labor force was unskilled and earned 37.5 percent of the monthly wage bill. (The managerial and senior staff constituted 2.5 percent of the labor force, but received 7.5 of the monthly wage bill.)

II.3. The Extent of Unemployment

The conceptual and practical problems of estimating the various types of unemployment are very complicated. It is the existence of social security and unemployment insurance in wealthy countries that gives the unemployed a viable alternative between no work and some work. In LDCs, on the other hand, if a man cannot obtain a full-time job, he has to take whatever part-time work is available.

In addition to these difficulties, unemployment appears in many forms. While some individuals are fully unemployed and seeking work, others, because of the high unemployment rate, stop looking for work. Since search costs may outweigh the expected benefits of employment, the unemployed may withdraw from the labor force.

³Subbiah Kannappan, "Urban Labour Market Issues in an Employment Strategy for the Sudan," International Institute for Labour Studies, Geneva, March 1975, p. 8.

TABLE 2.6.--Distribution by Status and Occupational Groups,
1966.

| Status and Occupational Groups | Number | % |
|--|-----------------|-------------|
| 1. Professional, Technical and Related Workers | 49,913 | 4.0 |
| 2. Administrative, Executive and Managerial Workers | 7,222 | 0.7 |
| 3. Clerical Workers | 29,757 | 2.7 |
| 4. Sales Workers | 59,482 | 5.4 |
| 5. Farmers, Fishermen, Hunters and Related Workers | 424,852 | 38.9 |
| 6. Miners, Quarrymen and Related Workers | 19,609 | 1.8 |
| 7. Workers in Transport and Communication Occupations | 28,627 | 12.6 |
| 8. Craftsmen, Production - Process Workers | 351,356 | 32.1 |
| 9. Service, Sport and Recreation Workers | 64,460 | 5.9 |
| 10. Workers not Classified by Occupation | 64,487 | 5.9 |
| | <hr/> 1,093,735 | <hr/> 100.0 |

Source: 1966 Census, op. cit.

TABLE 2.7.--Distribution of Work Force and Wages in the
Industrial and Services Sectors by Skills.

| Category | Employees | | Monthly Wages Paid | |
|--------------------------------|-----------|-------|---------------------------|-------|
| | Number | % | (in thousands of T.D.) | % |
| Managerial and Senior Staff | 5,248 | 2.5 | 799,811 | 7.5 |
| Engineers | 2,971 | 1.5 | 537,642 | 5.0 |
| Clerical Workers | 42,080 | 21.5 | 2,279,421 | 22.0 |
| Technicians | 10,114 | 5.0 | 924,655 | 9.0 |
| Skilled Workers | 41,141 | 21.0 | 1,968,183 | 19.0 |
| Unskilled Workers | 95,550 | 48.5 | 3,932,015 | 37.5 |
| Total | 197,104 | 100.0 | 10,441,127 | 100.0 |

Source: Ministère du Plan: Structure de qualifications et
des salaires, Tunis, January 1974 (mimeographed).

Here we try to measure the unemployment rate in two ways: (1) the visible or open unemployment rate for 1966; and (2) the rate of disguised unemployment for 1972. In addition, for each computation, provision would be made to take into account the emigrant workers who do have a claim on any job creation. Attention will also be given to rural-urban unemployment and to the unemployment of educated people.

The assessment of such unemployment figures is important to cost-benefit analysis, both from the individual and the social viewpoints for the determination of the expected income for the individual person, and in the evaluation of the social opportunity cost of labor.

II.3.1. The Visible Unemployment Rate, 1966.--The census of 3 May 1966 counted as employed "anyone" who had worked ten days or more during the preceeding month, regardless of the type of activity involved. Visible unemployment included everyone without any or with less than 10 days of work in the preceeding month. Out of the total population (4.533 million), 1.093 million were reported as in the labor force in 1966. The number of employed was 0.927 million. The 166,000 unemployed represent some 15.2 percent of the labor force.

The visible unemployment figures understate the seriousness of the situation. The census counted as employed those persons working on "Chantiers de Lutte

contre le Sous-Developpement" (CLCSD) during April 1966.⁴ The CLCSD is a relief work program to alleviate unemployment. No accurate figures are available on the number of persons employed under the CLCSD during April 1966, but some idea can be gained by taking the total number of man-days worked during 1966 (16.5 million) and dividing them by 200 (estimated average number of days worked per annum, per CLCSD worker). Using these computations, it is estimated that approximately 80,000 persons were employed under the CLCSD program at the time of the census. It should also be noted that the census month (April) reflects the unemployment situation throughout the country during ten months of the year. However, seasonal agricultural work is available in most parts of the country during two months of the year (midsummer, in the northern and central parts of the country for the harvesting of grain and fruit, and fall in the southern-central and southern regions for the harvesting of olives and dates). Revising the employment figures to take into account the estimated number of CLCSD workers at the time of the census, the total labor force of 1.093 million is divided into 0.847 million employed, while over 246,000 (22.5 percent) were either unemployed or working on the CLCSD program.

This number does not, however, reflect the large number of Tunisians who were (and still are) underemployed.

⁴See Chapter II, Section III.

TABLE 2.8.--Rates of Visible Unemployment, 1966.

| | Labor Force (million) | Employed (million) | Unemployed (000) | Rate of Unemployment % |
|--|--------------------------|-----------------------|---------------------|------------------------------|
| Visible Unemployment Census 1966 | 1,093 | 927 | 166 | 15.2 |
| Visible Unemployment (CLCSD Work Program) | 1,093 | 847 | 246 | 22.5 |
| Visible Unemployment (Migrant Workers) | 1,163 | 847 | 316 | 27.1 |

Source: 1966 Census, op. cit.; I.S.E.A.: Perspectives Sectorielles et Globales du Niveau de l'Emploi en 1980, Tunis, November 1968.

While the data compiled in the course of the 1966 census leave much to be desired, they are the best available on the extent of unemployment.

Another adjustment is necessary to make allowance for the 70,000 migrant workers in 1966. Without this exodus of workers, the employment problem in Tunisia would have had a different shape and magnitude. This adjustment is necessary to compute the expected income in our cost-benefit model for the individual person and in the evaluation of the social opportunity cost of labor. The labor force would have totaled 1.163 million, and the rate of visible unemployment would have been as high as 27.1 percent. In general, unemployment in Tunisia can be characterized as large scale, persistent, and made up of young unskilled and semi-skilled workers. The inclusion of emigrant workers is justified on two grounds: at least 60 percent of the migrant workers to France for the period 1968 to 1971 were unskilled and semi-skilled (see Table 3.6), and the level of unemployment for educated people (the semi-skilled workers) is important (see Table 2.11).

II.3.2. The Invisible Underemployment Rate, 1972.--Although the economics of surplus labor or invisible underemployment is now well established as an area in the study of LDCs, no standard definitions of a surplus labor situation emerges from the literature. Early writers such as Ragnar Nurske (1955) and Arthur W. Lewis

(1955) concluded that some workers could be withdrawn with no fall in the total agricultural output. Another definition identifies the situation of invisible underemployment as one in which the wage-rate to some workers is above their marginal productivity. Amartya K. Sen defined labor surplus as a condition in which agricultural output does not fall when labor is removed.⁵ It is now generally agreed that invisible underemployment exists when a person's (1) job does not permit the full use of his existing skill or capacity, (2) productivity is abnormally low, and (3) earnings from employment are abnormally low.

Invisible underemployment makes the cost of employment of labor very difficult to calculate. In a country with full employment, a person can be employed in a certain project only if he is withdrawn from employment somewhere else. This measure of what he would have alternatively produced is called "the social opportunity cost of labor" and is used in project evaluation literature. Defined this way, the opportunity cost of labor will be positive when there is full employment, but if there is unemployment the opportunity cost of labor may well be zero. However, several words of caution are in order. First, although labor may be unemployed, it does not follow that there is no unpleasantness of work, especially since industrial

⁵ Amartya K. Sen, Employment, Technology and Development (Oxford: Clarendon Press, 1975).

working conditions tend to be bad; this point is particularly important when there is a transfer of labor from the rural areas to the harsh living conditions of the cities. Second, it is essential to distinguish carefully between the different types of labor. Third, there is the regional dimension of labor supply. Even if there is a labor surplus in the economy as a whole, it may well be unevenly distributed between regions. There is a net social cost to the economy of bringing the unemployed labor from elsewhere.

The extent of underemployment can thus be determined only on a hypothetical basis and by recasting the employment figures into full-time equivalents.

For 1972, out of the 800,000 persons supposedly employed in agriculture, we know from the Fourth Development Plan that only 400,000 were fully employed males, while an equal number are seasonal workers.⁶ According to the planning division, under prevailing conditions and techniques, the 1972 agricultural output could have been produced with 80 million mandays of labor as compared to the 135 million mandays potentially available in this sector. There were, therefore, about 400,000 part-time or underemployed workers in agriculture alone. Some prior investigations have concluded that part-time workers in

⁶ Republique Tunisene. Ministere du Plan, Plan de Developpement Economique et Sociel 1973-1976 (Tunis, 1973).

the agricultural sector work only an average of 130 days a year, and that the fully employed will be working 200 days a year.⁷ Then, the full-time equivalent of the 800,000 persons employed in agriculture is about 560,000. This smaller total for agriculture has the effect of lowering the overall level of employment for 1972 from the plan's estimate of 1.385 million to 1.145 million. When applied to the 84,000 seasonal workers in the industrial sectors and the services, this same analysis will further lower the plan's estimate from 1.385 million to 1.090 million. Such calculations assume that part-time and seasonal workers are available for additional work at the going terms, but there unfortunately are no data bearing on this aspect.

Another revised estimate, taking into account the 200,000 migrant workers, puts the possible rate of visible underemployment at 36.7 percent (Table 2.9).

II.3.3. The Rural Urban Unemployment.--Owing to the combination of a number of important factors (heavy density settlement in agricultural areas, wide differences between rural and urban levels of income, the high rate of population growth, and the quantitative imbalance between labor supply and demand), the rural-urban drift has

⁷Republique Tunisienne. SEPEN. Plan de Developpement Economique et Social, 1965-1968 (Tunis, 1966).

TABLE 2.9.--Unemployment Rates, 1972.

| | Labor Force (million) | Employed (million) | Unemployed (000) | Rate of Unemployment % |
|---|--------------------------|-----------------------|---------------------|------------------------------|
| Visible Unemployment (IV Plan Figures) | 1,522 | 1,387 | .135 | 8.8 |
| Visible Underemployment | 1,522 | 1,090 | .432 | 18.3 |
| Visible Unemployment (Migrant Workers) | 1,722 | 1,090 | .632 | 36.7 |

Source: Ministere du Plan, Fourth Development Plan, 1973-76, pp. 180-200.

affected almost all cities in Tunisia. Tunisian cities have been centers of attraction for the surplus population of the surrounding countryside. Table 2.10 reveals that unemployment is more serious in the urban areas than in the rural ones.

The influx of jobless persons has exceeded the absorptive capacity of the urban labor market and has created serious problems. In the subsistence economy, the unemployed person benefits socially and economically from the extended family system. The pooling of economic activity and of incomes within a family provides relief for the unemployed members. In terms both of human dignity and personal satisfaction, the position of the underemployed farmer in the LDCs is by far preferable to that of the unemployed urban worker.

II.3.4. Unemployment and the Level of Education.--

Another feature is the high rate of employment among some categories of educated manpower such as secondary and primary school leavers. It appears from a survey on employment and migration in Tunis for 1971 that the more a person's education, the greater the likelihood that he or she will be unemployed.⁸ Table 2.11 brings out clearly the association between rates of unemployment and educational attainments for both males and females. By

⁸Institut National de la Statistique, Equête Migration et Emploi, Tunis 1972-73 (Tunis, Janvier 1973).

TABLE 2.10.--Rural-Urban Unemployment Rates, 1966.

| | Rural | Urban |
|--------------------------|---------|---------|
| Active Population | 533,038 | 560,697 |
| Unemployed | 103,158 | 117,958 |
| Rate of Unemployment (%) | 19.0 | 21.0 |

Source: 1966 Census, op. cit.

comparing rates of visible unemployment for the whole country and for 1972 (see Table 2.9), we note that rates of unemployment among people with secondary education are greater than the rate of visible unemployment for the whole country, which is 8.8 percent.

Such a situation is the result of the rapid expansion of primary and secondary education. The Tunisian government has given top priority to education in its economic development strategy. Without doubt, a poor country such as Tunisia, which is committed to an ambitious growth program, needs more highly educated people with the required administrative and technical skills. Then why is there educated unemployment? Several reasons may be suggested.

First, labor markets in LDCs respond to unemployment, but only sluggishly and with very long time lags.

Second, long-term manpower forecasts in the early 1960s predicting an enormous shortage for persons with secondary education encouraged an output which exceeds the absorptive capacity of the economy.

Third, a large share of the unemployment is better explained as due to the discrepancy between income and occupational status aspirations and immediate possibilities for persons who are in a position to refuse unattractive possibilities while waiting for the desired ones. This hypothesis, that a major component of the unemployment pool consists of people who with reasonable effort would

TABLE 2.11.--Rates of Unemployment by Sex, Age and Level of Education in Tunis
(Percentage).

| Age Group (Years) | Without any Education | | Primary Education | | Secondary Education | | Total | |
|----------------------|--------------------------|--------|----------------------|--------|------------------------|--------|-------|--------|
| | Male | Female | Male | Female | Male | Female | Male | Female |
| 15-19 | 31.6 | 6.9 | 60.9 | 41.5 | 66.7 | 75.0 | 58.2 | 33.3 |
| 20-29 | 5.5 | 9.5 | 23.6 | 23.6 | 25.0 | 48.9 | 16.2 | 17.3 |
| 30-39 | 9.3 | 8.5 | 5.4 | 22.2 | 20.0 | 100.0 | 8.6 | 11.6 |
| 40-49 | 6.4 | 11.1 | 7.5 | -- | 30.7 | -- | 7.4 | 12.8 |
| 50 & Over | 9.3 | 15.9 | 4.5 | -- | -- | --- | 8.3 | 13.8 |

Source: Institut National de la Statistique, Enquête, Migration et Emploi, Tunis
1972-73, Tunis, Janvier 1973, pp. 25-35.

be able to get some job, but who are unemployed because they prefer to continue to search for one with a better income, prestige, or working conditions, receives considerable support from the statistical evidence.

These points require some elaboration. A high proportion of the unemployed are young and relatively well educated. Youth have a greater tendency to accept unemployment rather than low paying jobs. As it appears from Table 2.11, the highest level of unemployment for males is for the age group 15-19 and with secondary education (66.7 percent). For a given age and educational level, the unemployment rate also will be higher for people born in cities than for those who have emigrated to them. Uncertainty of job acquisition and inadequate wealth level to sustain lengthy unemployment are likely to deter migration until a job has been obtained. Migrants have lower wealth levels on which to draw than do city-born people. In 1971, it was true that the average unemployment rate was higher for natives of the city of Tunis (14 percent) than for post-1962 immigrants from elsewhere (4.5 percent).⁹

Therefore, most of the educational urban unemployment has a "voluntary" component. Young educated people stay out of the labor force and await the supposedly good opportunities. The values of the educated unemployed and their families and the economic structure contribute to this

⁹Enquête, Migration et Emploi, op. cit., p. 35.

picture. At this point, it is necessary to clarify that the intent is not to assert that the unemployed prefer idleness per se; rather, the organization of the labor market may be such as to provide suitable jobs only after a substantial lag and to inhibit participation in the meantime.

III. Welfare Measures: The Public Works Program

Social security system in the wealthy countries provide a disincentive for those without a full-time job to prefer no work to some work. In poor countries, if a man cannot obtain a full-time job, he must take whatever part-time work is available. For this reason, a public works program using P.L. 480 food aid for payments in-kind was initiated late in the 1950s.

In 1954, French authorities began unemployment relief programs to employ surplus manpower on odd jobs. In these programs, also known as "charity work" enrollment was voluntary and very large (about 350,000 persons in 1955).

With the advent of independence, the program was called "the campaign against underdevelopment" or Chantiers de Lutte Contre le Sous-Developpement (CLCSD). The idea was to employ the largest possible number of available workers in a variety of simple jobs of real social and economic value. The apparent assumption was that there

is idleness in unacceptable proportions and that the existing agricultural technology cannot absorb the surplus labor. Such public works programs have several advantages. First, they can be designed to take advantage of seasonal unemployment. Second, they develop needed rural infrastructure--roads, housing, schools, clinics--which improves the "quality of life" in rural areas. Third, many of the projects, such as reforestation and land and water conservation, contribute directly to output as well as to the improvement of the country's natural resources.

In 1964 a distinction was made between national and regional projects. National projects are agricultural in nature (reforestation, soil conservation, wildlife protection, drainage, rangeland development, flood control, and so forth). The regional projects were concerned mainly with road maintenance and construction, soil and water development, building construction, archeological excavation, and urban rehabilitation.

The public works program is similar to any unemployment benefit scheme. It offers work to the jobless and income to those who have none. This works program became important in alleviating unemployment. Table 2.12 shows that the years of large enrollment correspond to declines in agricultural production.

Moreover, the implementation of such programs, especially at a regional level, was a logical consequence of an imbalanced employment market. To support our

TABLE 2.12.--Work Created by CLCSD Work in Runisia, 1958-1971.

| | Regional* Project Enroll- ments (000) | National* Project Enroll- ments (000) | Total* Enroll- ments | Equivalent Employment | Total Cost (in million of T.D.) | Agricultural Production (in 1000 T.) |
|---------|---|---|----------------------------|--------------------------|---------------------------------------|--|
| 1958-59 | | | 29.6 | 148,000 | 7.9 | 75.2 |
| 1960 | | | 31.0 | 155,000 | 9.8 | 66.2 |
| 1961 | | | 55.5** | 277,500 | 16.9 | 66.1 |
| 1962 | | | 57.9** | 289,500 | 18.3 | 62.7 |
| 1963 | | | 35.3 | 176,500 | 13.2 | 77.3 |
| 1964 | 11.0 | 17.0 | 18.0 | 241,000 | 9.5 | 70.5 |
| 1965 | 4.8 | 21.0 | 25.8 | 129,000 | 9.8 | 81.8 |
| 1966 | 5.3 | 11.0 | 16.3 | 81,500 | 8.0 | 100.7 |
| 1967 | 7.5 | 12.9 | 20.4 | 102,000 | 10.1 | 100.2 |
| 1968 | 6.7 | 9.8 | 16.5 | 82,500 | 8.3 | 96.0 |
| 1969 | 10.9 | 7.6 | 18.5 | 92,500 | 9.0 | 87.8 |
| 1970 | 10.9 | 11.9 | 22.8** | 114,000 | -- | 78.0 |
| 1971 | 3.9 | 7.8 | 11.7 | 58,500 | -- | -- |

*In millions of man-days.

**Years of low agricultural production.

Source: U.S. AID; Task Force Report, "P.L. 480." Tunis, 1973; Ministère du Plan:
Production et valeur ajoutée par branche, 1960-1971.

contention, we worked out a basic theoretical framework which assumes that the distribution of the CLCSD funds is related to regional unemployment rates. The model we have used is based on simple empirical observations (see Table 2.13). The testable linear regression model is as follows:

$$RE_i = a + b (MUR_i), \quad (2.1)$$

where the dependent variable RE_i represents the regional distribution of CLCSD enrollments for the 13 regions in Tunisia ($i = 1, 2, \dots, 13$) and the independent variable MUR_i represents the regional male unemployment rate (male unemployed over the regional male labor force for the 1966 census year) for ($i = 1, 2, \dots, 13$). A least squares estimate of (2.1) yields:

$$RE = 2.912 + .687 MUR, \quad (2.2)$$

(.215)

and $R^2 = .472$. R^2 is the correlation coefficient.¹⁰ Despite the lack of data, this empirical evidence shows that the higher the male unemployment rate in region i , the higher will be the enrollment in CLCSD for that region. Work in CLCSD is accepted by the unemployed or underemployed as a last resort. Unemployed males over the age of 15 are potential participants in the CLCSD program.

¹⁰ R^2 refers to the coefficient of determination and is an indicator of the goodness of fit of the regression. A perfect fit would correspond to a value of $R^2 = 1.0$
() estimated standard errors of a and b .

TABLE 2.13.--Regional Unemployment Rates and Distribution of CLCSD Funds.

| Gouvernorats | Male Labor Force (A) | Male Unemployed (B) | Unemployment Rate A/B % | Regional Distribution of CLCSD Participants (C) | C/B % |
|--------------|----------------------------|---------------------------|----------------------------------|---|----------|
| Tunis | 201,900 | 30,700 | 15.2 | 6,400 | 20.8 |
| Bizerte | 78,300 | 19,000 | 24.2 | 6,400 | 33.6 |
| Beja | 74,400 | 21,600 | 29.0 | 9,900 | 45.8 |
| Jendouba | 58,300 | 31,800 | 54.5 | 18,500 | 28.2 |
| Kef | 71,300 | 19,500 | 27.3 | 5,500 | 28.2 |
| Nabeul | 76,100 | 9,800 | 12.8 | 3,700 | 37.7 |
| Sousse | 103,300 | 21,200 | 20.5 | 6,600 | 31.1 |
| Sfax | 89,100 | 15,500 | 17.3 | 2,900 | 18.7 |
| Kairouan | 64,400 | 14,900 | 23.1 | 3,100 | 20.8 |
| Kasserine | 47,000 | 17,600 | 37.0 | 5,700 | 32.3 |
| Gafsa | 71,600 | 13,700 | 19.0 | 5,000 | 36.4 |
| Gabes | 41,400 | 11,100 | 26.8 | 4,700 | 42.3 |
| Medenine | 50,300 | 15,200 | 30.2 | 5,500 | 36.0 |

Source: Population Census, May 1966, op. cit.

The data on the CLCSD program lead us to the conclusion that funds provided to CLCSD workers could be considered welfare payments for the unskilled unemployed. We should keep in mind throughout the subsequent analysis of the cost-benefit model that such payments are one of the variants in the social cost-benefit analysis.

IV. Planning and the Employment Expansion

Development planning in Tunisia has been strongly influenced by the theory and experience of industrialized countries. Most development plans in the 1960s had as their major objective the growth of GDP. Although performance by this criterion was quite impressive, averaging about 5 percent annually for LDCs as a group, this growth was insufficient to absorb the burgeoning labor force. How did Tunisian's four development plans tackle employment problems and the promotion of employment? To answer this question, two points need to be reviewed: (1) targets and economic policies in the plans and actual performance of the Tunisian economy between 1962 and 1971, and (2) the Fourth Development Plan for 1973-1976.

IV.1. Targets and Economic Policies in the Plans

In the Decennial Perspectives of 1962-1971, top priority was given to the growth of output. A dominant and exclusive role was given to investment. The employment

objective was treated as a subsidiary or residual one. Economic growth was regarded as a planned attempt to maximize real per capita income, subject to certain financial and resource constraints. The employment objective, although recognized as a goal of development, was placed next in importance to the income objective.

The targets in the Ten-Year Perspective Plan covering the decade 1962-1972 were:

- the attainment of a per capita income of 50 T.D. by 1972 (or an average annual increase of 2.9 percent from 1962 to 1972);
- from the ambitious goal of full employment, Tunisian planners shifted to a more moderate one of assuming absorption of the increase in the active labor force along with the progressive elimination of the existing unemployment over time;
- an average annual rate of growth of 6 percent in GDP;
- an increase in the investment ratio (investment over GDP) from 17 percent in 1961 to 32 percent in 1971;
- universal education for all children of school age; and
- improvement in health care.

Because of the abundant labor supply, it was supposed that the failure of development lay in the

shortage of capital. The assumption was that the supply of labor at the relevant wage rate was perfectly elastic and that the level of future employment would be determined by changes in the demand for labor.

The first medium-term plan (1962-1964) was devoted to a reform of archaic and obsolete national structures. The second four-year plan (1965-1968) was based on more detailed and accurate statistics than the first. The emphasis was on the establishment of a new industrial structure to provide work for everyone entering the labor market each year. This third development plan (1969-1972) struck a more optimistic note, since it made no mention of disguised underemployment and estimated the number of jobs to be created during 1969-1972 to be higher than the additional demand generated during the same period. It envisaged an annual average of 3,000 to 5,000 emigrant workers each year. Much hope was placed on an active vocational program, as a solution to the unemployment problem.

The three plans emphasized the fact that a "supplementary strategy" was needed to mop up the remaining unemployed by the establishment of labor-intensive public work programs: the CLCSD.

In general, the employment issue was not tackled effectively. Manpower planning can be described as macro-planning in the sense that the projections of labor requirements for economic growth were derived from certain macro-economic data such as planned investment and aggregate

input-output relationships. The use of technical coefficients for the principal sectors was generalized in order to estimate the number of persons who would actually be employed at the end of the planning board. Investments to be undertaken in different ventures were not selected on the basis of the number of job opportunities that would result, but on their internal rate of return. Such an ad hoc project-by-project approach is not adequate for an employment oriented strategy, particularly since market prices reflecting a number of factor price distortions underlie the rate of return calculations.

From 1961 to 1971, GDP at 1966 constant prices grew at a 5.3 percent compound growth rate. The industrial sector grew at a compound growth rate of 7 percent (see Table 2.14). This compares well with average real growth rates for African and Latin American countries, estimated at 3 and 4.2 percent a year, respectively, for the same period.¹¹ In 1961, gross fixed capital formation was 21.3 percent of GDP; in 1971 it was 22.2 percent, which is quite high by international standards. In 1971, the gross fixed capital formation was financed through domestic savings in the proportion of 93 percent, compared with 55.3 percent in 1961. However, these massive investment efforts, estimated at 1,200 million Tunisian dinars for the period 1961-1971, did not result in a sufficient growth of

¹¹Lester B. Pearson, Partners in Development (New York: Praeger, 1970), pp. 27-30.

TABLE 2.14.--Compound Growth Rates of Economic Sectors,
1961-1971 (Percentage).

| Sectors | GDP | Value Added Per Man | Employment |
|---------------------------------------|-------|---------------------------|------------|
| Agriculture | - 1.8 | | |
| Mining and Quarrying | 3.4 | - 0.9 | 4.0 |
| Electricity, Water and Gas | 13.5 | 7.5 | 2.3 |
| Petroleum | 68.7 | - 0.2 | 5.5 |
| Food, Beverages & Tobacco | 1.5 | 0.3 | 1.6 |
| Construction Materials | 12.0 | 4.5 | 7.2 |
| Mechanical & Electrical Industries | 16.0 | - 1.1 | 17.4 |
| Textile, Clothing & Leather | 21.0 | 3.9 | 16.5 |
| Chemical Industries | 14.0 | 6.3 | 7.4 |
| Wood & Furnishing | 12.0 | 0.8 | 11.1 |
| Paper, Printing Industries | 11.0 | - 2.8 | 14.3 |
| Other Industries | 24.0 | 6.0 | 16.9 |
| S/T Manufacturing Industries | 7.0 | - 0.8 | 7.8 |
| Construction | 3.9 | - 0.04* | 4.0 |
| Transportation | 5.9 | 1.3 | 5.7 |
| Tourism | 30.0 | 2.8 | 26.9 |
| Commerce | | | 7.5 |
| Other Services | | | 5.4 |

*GDP per man and not value added.

Note: Employment data refer to full-time equivalent of seasonal employment.

Value added in constant prices per full-time equivalent of seasonal employment.

Sources: Stolper Wolfgang F. and Kleve, Jacob J,
Investment, Employment and Productivity in the
Tunisian Economy, 1961-1971, Tunis 1973
(mimeographed).

productivity. As reported by Wolfgang F. Stolper and Jacob G. Klevorick (1973), productivity was on the downtrend, while wages and salary payments moved upward.

Two other setbacks occurred. First, the growth in the agricultural sector was rather disappointing (see Table 2.14) despite its modernization. The large investment programs in that sector amounted to 240 million Tunisian dinars, or 20 percent of the total investment effort for the whole period. It might be argued, however, that investments and institutional reforms made during the 1960s will have their full impact in the next decade. Second, from 1961 to 1971 labor supply was estimated to have increased by 537,000 persons. But only 132,000 new jobs were created, and about 200,000 workers (see Chapter III) emigrated to foreign countries. Thus, some 205,000 workers joined the ranks of the unemployed. Therefore, in 1972 over 28 percent of the Tunisian active population was either unemployed or underemployed. Such a situation was in part due to the prevailing factor price distortions and import-substitution policies.

IV.1.1. Factor Price Distortions.--For the last twenty years the basic problem has been a divergence between profitability as seen by private decision makers and social profitability from the national point of view. More specifically, capital (a nominal interest rate of 6 to 8 percent has been charged by banks to industrial borrowers) and

foreign exchange has tended to be underpriced relative to its scarcity, while labor has tended to be overvalued in terms of its opportunity cost. The result has been a capital-intensity that has tended to limit employment and a mechanization that appears to be more labor displacing than output increasing. The long-run results of this process are most certain to lead to increased employment problems. Moreover, other factors have strengthened this tendency: (1) a wide spectrum of concessions and fiscal policies, depreciation allowances, cheap capital goods (admitted duty free), and costly finished goods (heavily protected); (2) minimum wages for unskilled workers; and (3) exhortations that employers adopt a "progressive" attitude (this implied a wide range of social costs and fringe benefits), which discouraged labor-intensive techniques.

IV.1.2. Import Substitution Industries.--As a result of colonial rule, as did many other LDCs, Tunisia expressed discontent with its dependence on export markets and followed an "inward looking" policy during the 1960s. LDCs were surely correct in rejecting any passive course of discontinued specialization in primary production, and development does require diversification. But diversification can be done well or badly. To shut off imports and start domestic production with poor principles of selection

leads to a tangled structure of production and continued dependence on external conditions.

The industrialization drive was accelerated through policies involving large subsidies.¹² The new industrial base turned out to be a burden rather than a benefit to the economy. Import Substitution Industries (ISI) were developed by the use of high and increasing import duties combined at times with quantitative restrictions. Import duties of 100 percent or more became the rule rather than the exception and were justified very often on traditional infant industry grounds. These ISI suffered from low technical efficiency (some firms were reported as producing only 20 to 40 percent of their potential output).¹³ It has now become part of the conventional wisdom to lend three basic criticisms at the import substitution policies most LDCs have instituted. First, it is difficult to imagine a manner in which the excess capacity in the industrial sectors of the LDCs can be put to use without requiring the generation of industrial export. It is probable that by expanding

¹²Government subsidies to enterprises (in million of Tunisian dinars) were as follows:

| 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 |
|------|------|------|------|------|------|------|
| 14.8 | 14.3 | 13.9 | 19.8 | 22.4 | 19.0 | 17.4 |

Source: Ministere du Plan: Statistiques 1960-1971, Tunis, 1973 (mimeographed).

¹³Capacity is understood to mean that there is only one shift of workers operating in the industry concerned each day.

domestic aggregate demand, a market for most of the industrial products could be developed. However, such action would also generate a need for additional imports which would be impossible to satisfy with the existing level of exports and other foreign exchange revenues. Second, the potential for import substitution has been exhausted to a large extent. Third, the unemployment situation and its prospective deterioration make the creation of jobs exceedingly urgent.

Although these comments on factor price distortions and ISI have been very brief, they suggest how the long-run employment problem centering on population explosion is aggravated by faulty policies as regards appropriate technologies and prices.

IV.2. The Fourth Economic Development Plan (1973-1976)

The experience of the 1960s and its disappointing effects emphasized the possibility that the income objectives of planning may be more easily achieved than the employment objectives. Employment creation increasingly has been accepted as a primary goal of economic development and new development targets have been incorporated into development policies.

The first alternative set of policies aims at a reduction of some of the gross inefficiencies attending industrial development; it seeks to do this through the

readjustment of a number of crucial, previously distorted, relative prices, including the interest rate and the exchange rate. The economy should move out of its administered-price, import substitution, orientation into a more market-oriented, export phase. Targets include an average growth rate of 9.6 percent at constant market prices for industrial output, and an investment total of about 1,250 million T.D. or 25.3 percent of GDP. However, the prospects of such an "outward-looking" policy are uncertain, as markets in developed countries are not easily accessible. Protectionist policies on the part of the advanced countries directed against light consumers' goods from developing countries are a serious obstacle threatening the growth of some of the exporting nations.

Besides the industrialization effort, the Fourth Development Plan initiates a rural promotion program (Programme d'Animation Rurale) for community development through extending irrigation and fishing activities and building small industries using labor-intensive technology. A sharper accent has been placed on the role of agriculture in the development strategy. There is a growing recognition that if the agricultural sector does not make sufficient progress, the drive to improve the level of living will be frustrated.

2007

2011

2012

2013

2014

2015

2016

Conclusion

Tunisia suffers from chronic and intractable unemployment. Solutions, however, are difficult from a political, administrative, financial, and psychological point of view, but the danger from lack of action is also great. Emigration provides at least a short-term solution and has the additional advantage of circumventing many of these difficulties. The study of these migration flows constitute the next main topic, considered in Chapter III.

CHAPTER III

THE FLOWS OF MIGRANT WORKERS

The third quarter of the twentieth century saw the ascendancy of what could be called the labor import-export phenomenon. Although a late starter among the Mediterranean labor exporting countries, Tunisia has become a major supplier of new workers to Western Europe. While abroad, Tunisian migrants have worked mainly in manufacturing and construction.

Although the stock of Tunisian migrants abroad (about 200,000 in 1973) has not equaled that of earlier migrant exporters such as Italy, Yugoslavia, Greece, and Turkey, the subject has become a major concern to politicians, administrators, and social scientists in Tunisia. The study of these flows and the determinants of the emigration process will be dealt with in three sections. The first examines the European labor market. The second pulls together the available and statistical material corresponding to the various classes and categories used in this study. The third analyzes migration flows and their relationships with income differentials and employment opportunities.

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I: The European Labor Market

In the nineteenth century, Europe was overpopulated. It found outlets for its demographic surpluses in colonial territories and in America. According to Brinley Thomas (1973), some 51 million Europeans emigrated from the European continent. These emigrants sought freedom and opportunities for a new life.

The last twenty years have been marked by very profound changes in the direction and characteristics of migration: from a movement of populations to a transfer of the labor force. Western Europe, more specifically its industrialized areas, with the effective aid of U.S. long-term credits, witnessed a remarkable economic growth which was furthered by various processes of regional economic integration (European Economic Community, European Free Trade Area). Economic and political forces no longer encourage overseas migration, since there are good economic opportunities available at home. In 1950-1955, economic growth in Europe took place at a much faster rate than in the United States or Canada and was generally accompanied by full and often over-full employment. Germany, Italy, Switzerland, and the Netherlands were the fastest growing nations among the developed countries in Europe, as it appears from the analysis of Charles P. Kindleberger (1967).

The "push" of unemployment and underemployment in the labor exporting countries and the "pull" of economic

opportunities in the receiving countries became the real and major determinants of the size and trend of international migration flows. These new flows of emigrant workers from the LDCs, especially from the Mediterranean countries (Portugal, Yugoslavia, Greece, Turkey, Cyprus, Morroco, Algeria, and Tunisia), largely met the labor requirements created by the economic boom in Europe. In Solomon Barkin's terms (1967), the "European labor market was converted from a sellers' to a buyers' market." These migration flows since the 1950s were characterized (and sometimes aided) by several features.

First, there has been an adequate rate of growth of the labor supply. (As the capital-labor ratios in some sectors are difficult to alter, this is one of the most important factors making for growth).¹

Second, there has been a more rapid increase in the overall demand for labor than national sources could supply in Western countries, the latter due to longer education time and shorter weekly hours of work.

Third, in the receiving countries, growth with migrant labor proceeded with a minimum of infrastructure investment because the hosts did not have to provide housing, social services, schooling, and so forth.

¹Charles P. Kindleberger, Europe's Postwar Growth: The Role of the Labor Supply (Cambridge, Mass.: Harvard University Press, 1967).

Fourth, the entry of foreign labor introduced greater mobility in the labor market and permitted domestic labor to move up in the social and economic scale. Unskilled work in receiving countries was turned over almost entirely to foreign laborers. Even Sicily reportedly is now receiving Tunisian workers (about 2,000 to 3,000 persons) to perform the more menial tasks, which Sicilians perform as immigrants in Northern Europe. [Vera Lutz (1963), studying the Swiss case, emphasizes that foreign workers have been a noncompeting group for menial jobs since education and training enabled Swiss workers to avoid disadvantageous occupations (agriculture, construction, mining, hotel services, textiles, and metal working). Such occupations are no longer sought by Swiss workers.]

Fifth, cheap (foreign) labor, as described by Arthur W. Lewis (1955), fed the economic growth of Europe by holding down wages, and this led to high rates of profit, investment, and expansion.² Since labor shortages were the major constraints to rapid economic growth, imported labor enabled these countries, and especially Germany, France, and Switzerland, to maintain a high rate of growth and exports.

Sixth, continuing although weakened colonial links and the facilities which have been accorded former

²Ibid.

colonials by right or de facto have induced thousands of unskilled workers from Africa, Asia, and the Caribbean to seek and find unskilled jobs in European countries. The colonial link means that the cultural barriers to such migration are lower than for other types of migration. The emigrant moves into what he assumes (sometimes incorrectly) will be a familiar culture.

In the mid-1950s, Italy was almost the only important source of continental emigration. Until 1961, the bulk of foreign labor came from Italy, Spain, and Algeria, with smaller amounts from Portugal, Yugoslavia, and Greece. But as Italy and Spain became more developed, the number of workers sent abroad each year leveled off. The increasing demand for foreign workers in the European countries (see Table 3.1) led to an increasing competition among the receiving countries, which began to widen their search for imported labor. Tunisian migrant workers suffering from severe unemployment offered their services abroad. Owing also to the fact that its geographical situation is more favorable than that of Greece, Turkey, and Yugoslavia, Tunisia joined the labor exporting countries.

II. The Tunisian Migrant Workers: Numbers and Characteristics

The stock of Tunisian emigrants in foreign countries represented, at the end of 1973, about 200,000 persons. More than 90 percent of these emigrants have left

TABLE 3.1.--Foreign Workers Admitted in the European Countries, 1960-1969 (in thousands).

| Country | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 |
|-------------|------|------|-------|-------|-------|-------|-------|------|-------|-------|
| Germany | 259 | 360 | 397 | 378 | 442 | 525 | 425 | 152 | 391 | 646 |
| France | 159 | 176 | 208 | 217 | 275 | 284 | 259 | 222 | 223 | 301 |
| Belgium | 3 | 5 | 15 | 26 | 24 | 32 | 24 | 12 | 8 | 8 |
| Switzerland | 295 | 371 | 402 | 389 | 401 | 320 | 288 | 274 | 273 | 292 |
| Netherlands | | 11 | 13 | 17 | 31 | 31 | 36 | 12 | 19 | 28 |
| Austria | | 7 | 9 | 15 | 21 | 41 | 49 | 57 | 46 | 53 |
| Total | 716 | 930 | 1,044 | 1,042 | 1,194 | 1,233 | 1,078 | 730 | 1,328 | 1,328 |

Source: O.E.C.D. Statistics of the Labor Force, Paris, 1970.

Tunisia since 1963. Tunisian migration to Europe has become marked since 1966, although Tunisian migrants have been noticed in Europe at least since World War II. In France there were 3,200 Tunisian workers in 1946, 4,800 in 1954, and 25,659 in 1962.³ Until 1965 (see Table 3.2), the number of Tunisian migrants was relatively small.

The data listed in Table 3.2 are subject to the following limitations: (1) There are many problems in the utilization of the available data on migrant workers in Western Europe. Different countries use different definitions of "migrant"; some base this on length of stay, some on registration, and some on residence. Most of the data refer only to so-called annual or permanent workers (on 12-month renewable permits); (2) almost no information is available about the number of migrants who return to their countries of origin. These data, as reported by receiving countries, therefore represent gross inflows; (3) the statistics are derived from a count of work permits issued and not of actual arrivals, since some migrants fail to make use of their permits; and (4) official migration statistics usually underestimate the actual number of immigrants, since some aspirant workers enter on tourist passports and so avoid registration as migrant entrants.

³French population censuses of 1946, 1956, 1954, and 1962.

TABLE 3.2.--Emigration by Country of Destination, 1962 -1973.

| | France | Germany | Libya | Other Countries (I) | Total (I) | Family Migration to France (II) | Total (III) (I & II) | Net Emigration ⁴ |
|------------------|---------------------|---------|--------|------------------------|--------------|--|----------------------------|--------------------------------|
| 1962 and earlier | 17,000 ² | | | | 17,000 | | 17,000 | 8,494 |
| 1963 | 3,153 | | | | 3,153 | | 1,153 | 6,958 |
| 1964 | 2,730 | 44 | | 506 | 1,323 | 1,323 | 4,603 | 10,200 |
| 1965 | 5,776 | 29 | 126 | 443 | 2,263 | 2,263 | 8,637 | 11,400 |
| 1966 | 6,631 | 326 | 1,287 | 402 | 8,645 | 1,737 | 10,382 | 12,600 |
| 1967 | 6,534 | 173 | 4,664 | 242 | 10,613 | 2,012 | 12,625 | 14,500 |
| 1968 | 6,109 | 481 | 1,647 | 235 | 8,472 | 2,665 | 11,137 | 17,800 |
| 1969 | 14,925 | 2,093 | 1,373 | 219 | 18,610 | 2,944 | 21,944 | 21,554 |
| 1970 | 11,070 | 4,990 | 575 | 335 | 16,970 | 3,731 | 20,701 | 21,900 |
| 1971 | 9,971 | 2,769 | 2,984 | 890 | 16,614 | 3,912 | 20,526 | 32,300 |
| 1972 | 9,890 | 1,524 | 5,854 | 389 | 17,657 | 4,223 | 21,880 | 24,500 |
| 1973 | 20,857 ⁶ | 2,566 | 11,511 | 536 | 35,470 | 5,000 ⁹ | 40,470 | 17,768 |

TABLE 3.2.--Continued.

| | France | Germany | Libya | Other Countries (I) | Total (I) | Family Migration to France (II) | Total (III) (I & II) | Net Emigration ⁴ |
|-----------------|----------------------|---------------------|---------------------|------------------------|--------------|--|----------------------------|--------------------------------|
| Official Total | 113,646 ⁵ | 14,995 ⁷ | 30,020 ⁷ | 4,197 ⁷ | 162,858 | 29,810 ⁸ | 192,668 | 206,375 |
| Other Estimates | | | 20,000 ³ | 9,000 ³ | 29,000 | | 29,000 | 17,000 ² |
| Total | 113,646 | 14,995 | 50,020 | 13,197 | 191,858 | 29,810 | 221,668 | 223,375 |

Notes and Sources on Table 3.2:

¹Switzerland, Holland, Belgium, Austria, Greece, Algeria, Italy, and so forth.

²This is not the actual flow of workers, but the estimated number of Tunisian workers in France 1962. French Population Census 1962.

³Ministry of Planning estimates.

⁴Annuaire statistique de la Tunisie, 1961-1965 et Bulletin Mensuel de Statistiques, 1966-1973.

⁵Office National de l'Immigration: Annual Reports 1967-1972.

⁶From: Ministère du travail, de l'emploi et de la population, France. Bulletin Mensuel de statistiques du travail, Janvier, 1974.

⁷OTTEFP: Annual report 1971 and Bulletin Mensuel de Statistiques 1972-1973.

⁸Office National de l'Immigration: Annual Reports 1967-1972.

⁹Our own estimates for 1973.

From Tunisian net emigration flows, however, we ascertain that the total labor emigration amounted to about 200,000 persons at the end of 1973. Over 55 percent of Tunisian migrant workers are in France, over 25 percent in Libya. We must add to the official figure the clandestine movement of emigrants to Libya. Between 1969 and 1972, 146,211 persons were caught trying to enter Libya in this manner.⁴ The movement to Europe has been more controlled. For 1973, for France, the high number of 20,857 refers not only to work permits issued but also to past clandestine emigrants whose status was regularized. Semi-skilled or skilled workers may come to France on their own initiative (as tourists) and may subsequently be offered employment. With such an offer, they can apply to the local prefecture for a conditional residence permit, which is made final when the Ministry of Labor gives permission to take the offered job.

Between 1962 and 1967, attempts were made by the Tunisian government to better organize this immigration movement. Several bilateral arrangements were worked out between Tunisia and France (1962), Germany (1965), Belgium (1966), Holland (1970), and Libya (1971). Moreover, in March 1967 the government established the state employment and placement service: Office Tunisian des Travailleurs

⁴Ministere de l'Interieur figures are:
 1969: 29,356 1971: 40,665
 1970: 32,939 1972: 43,251.

Emigrants de l'Emploi et de la Formation Professionnelle (OTTEFP).

In addition to the data on migrants in Table 3.2, data were collected on certain qualitative characteristics of migrant workers. These included: (1) age distribution of the migrants; (2) marital status; (3) quality of the migrant labor force; (4) recruitment procedure; and (5) the related subject of remittances. Information on these topics is not always available for all the countries involved, and even then it is not presented on a uniform basis. However, some common characteristics do emerge which we shall review in the subsequent analysis.

II.1. Age of the Migrants; the Population's Age and Birth Rate

The age distribution of the population is an important determinant of its future rate of growth. In general, population is classified into three different categories: (1) progressive, having a high proportion of children and a high rate of growth; (2) stationary, having moderate proportions of children and aged persons with a slow growth and stationary numbers; and (3) regressive, having a high proportion of aged persons and declining numbers.

The occurrence of large-scale emigration over a short period of time will have a strong impact on the age structure of the population. A large proportion of

emigrants in the reproductive age brackets, 15-44 years, may retard population growth through the temporary or permanent absence of one of the marriage partners, through postponement of marriage due to the emigration of young people, and through greater spacing of births due to temporary absence.

Furthermore, decreases in the birth rate have a cumulative character: fewer births mean fewer young people entering the marriage brackets in later years. Indirectly, this possible retarded natural growth may in the long run contribute to increased economic growth via lower pressure on infrastructure facilities, thereby releasing scarce capital for more productive investment. About 90 percent of Tunisian emigrants from 1969 to 1972 (see Table 3.3) were between the ages of 15 and 30 years, but the impact of these migration flows on the birth rate are not certain. As pointed out by Stanley F. Friendlander (1968), there is still much controversy over whether the decline in the birth rate is due to the large-scale emigration of the male productive population or to deliberate attempts to limit family size consciously. The information on the age of migrants confirms that migration is a youthful phenomenon. It allows individuals to maximize the present discounted value of their future income stream by taking advantage of the wage differential between two areas. The movement of labor involves costs, and the distance to be traveled will affect the net income stream. The probability that a

TABLE 3.3.--Age of Emigrants (Percentage).

| Years | 20 | 30-39 | 40 & Over | Total |
|-------|------|-------|-----------|-------|
| 1969 | 8 | 80.4 | 11.6 | 100 |
| 1970 | 10 | 79.0 | 11 | 100 |
| 1971 | 11.8 | 78.3 | 9.9 | 100 |
| 1972 | 14.6 | 76.1 | 9.3 | 100 |

Source: OTTEEFPP, 1971 Report.

labor force member will migrate is likely to decrease as his age increases, since older persons have a shorter expected working life over which to realize the advantages of migrating. The relatively high proportion of migrant workers to Libya in the age group 40 years and over (see Table 3.4) could be explained by the fact that travelling costs to Libya are far less expensive than to Europe. These older migrant workers to Libya, therefore, would need to maximize their net income stream over a shorter period and with minimum costs.

II.2. Marital Status

Most of the emigrants are single, and this percentage is increasing, as is shown in Table 3.5.

Most host countries have introduced some restrictive measures: (1) foreign workers may only have their families join them after a certain minimum period of residence; (2) an immigrant worker's spouse may only take up work after a specified interval (this measure is presently being applied in West Germany in order to protect the labor market); and (3) the right to bring one's family over may be subject to various conditions, for example, the availability of adequate housing. Germany and Switzerland require at least five years of work before a worker may bring in his family. But as shown in Table 3.2, there has been a marked increase in the importance of family migration as a proportion of the total outflow. This is

**TABLE 3.4.--Age of Emigrants by Country of Destination,
1969-1972 (Percentage).**

| Age Group (Years) | France | Germany | Lybia | Netherlands | Other Countries |
|------------------------------|---------------|----------------|--------------|--------------------|----------------------------|
| -20 | 13 | 12 | 4 | 3 | 10 |
| 20-29 | 55 | 74 | 31 | 72 | 70 |
| 30-39 | 24 | 13 | 39 | 24 | 17.5 |
| 40 & Over | 8 | 1 | 20 | 1 | 2.5 |
| Total | 100 | 100 | 100 | 100 | 100 |

Source: OTTEFP, 1971 Report.

TABLE 3.5.--Percentage of Single Migrants.

| Years | | 1968 | 1969 | 1970 | 1971 | 1972 |
|---------------------------|-----|------|------|------|------|------|
| Number of Single | (%) | 49 | 48 | 59 | 63 | 72 |
| Number of Total Emigrants | | | | | | |

Source: OTTEEF: Annual Reports, 1968 to 1972.

pronounced for France (for which data are available), since French regulations require only the finding of decent housing. If married emigrants could take the members of their families abroad with them, this would correspondingly reduce excess demand for housing in Tunisia.

II.3. The Quality of the Migrant Labor Force

The only published data on the skill breakdown of Tunisian migrant workers is that for France. L'Office National de l'Immigration (ONI) gives data for unskilled, semi-skilled, and skilled workers, and for technicians. A breakdown of this distribution by sector of employment is available.

A comparison of the ratios of unskilled to skilled migrant workers in France between 1968 and 1971 with the ratios of the unskilled to skilled permanent workers in the industrial sector of the Tunisian economy for 1972 indicates that migrants to France were clearly more skilled. All the ratios in Table 3.6 are below one except for the mining and quarrying sector. These figures provide alarming confirmation of what has been reported to this author during field investigations in the electrical, mechanical, and construction industries; namely, that an increasing number of skilled Tunisian workers are leaving their jobs to migrate. There has also been a decline in the ratio of unskilled to skilled workers among Tunisian

TABLE 3.6.--Ratio of Unskilled to Skilled Workers for Industrial Sectors in Tunisia and for the Emigrants to France, 1969-1971.

| Industrial Sectors | Tunisian Industrial Sectors | | | | Emigrants to France* | |
|--|-----------------------------|---------------|---------|-------------|----------------------|---------|
| | Skilled (a) | Unskilled (b) | b/a (%) | Skilled (a) | Unskilled (b) | b/a (%) |
| Water, Electricity and Gas | 2,340 | 1,860 | 0.79 | 34 | 14 | 0.4 |
| Mining and Quarrying | 4,712 | 10,318 | 2.19 | 100 | 115 | 1.04 |
| Food, Beverages & Tobacco | 2,893 | 6,993 | 2.42 | 376 | 323 | 0.86 |
| Construction Materials, Ceramics and Glass | 1,653 | 5,014 | 3.03 | 301 | 225 | 0.74 |
| Mechanical and Electrical Industries | 3,224 | 4,094 | 1.27 | 4,374 | 1,877 | 0.43 |
| Chemical Industries | 1,036 | 2,072 | 2.0 | 298 | 163 | 0.55 |
| Textile, Clothing & Leather | 4,932 | 6,644 | 1.34 | 1,151 | 289 | 0.25 |
| Paper, Printing, Other Industries | 1,644 | 3,274 | 2.0 | 717 | 466 | 0.65 |
| Construction | 4,134 | 7,111 | 1.72 | 13,145 | 6,172 | 0.47 |
| Transportation | 7,377 | 11,824 | 1.52 | 177 | 175 | 0.98 |

*For permanent workers only.

Source: Ministère du Plan: Structure des Qualifications et des Salaires, Tunis, Jan. 1974. ONI: Annual Reports, 1969-1971.

emigrants to France. Tijanni Ben Sassi (1968) reports that 71 percent of Tunisian emigrants to France in 1968 were unskilled, while in 1971 the ratio was only 31.8 percent. But these findings should be considered with great care for two reasons. First, the ratio of unskilled to skilled permanent workers in the Tunisian industrial sector shows a marked imbalance. A number of public firms employ more unskilled workers than needed because of labor union pressure and the "welfare" aspects of the social and economic policies of the Tunisian government. Second, although the French figures give a breakdown of job classification, there are reasons to believe that these figures are significantly biased toward lower productivity jobs for wage purposes. The number of unskilled workers reported is higher than the actual figures; therefore, the ratio of unskilled to skilled workers should be regarded as a minimum.

II.4. Recruitment

To go abroad, a worker must apply to the OTTEEFP. Before allowing any departure, a three-man commission (labor union, employer, and government representative) must concur. The aspirant migrant worker would apply to the nearest local office of the OTTEEFP; there he is interviewed and his skills, experience, and occupation are recorded. Officially, the potential migrant must have been registered as unemployed for at least a period of three

consecutive months. A question of major interest is whether or not the aspirant migrant worker has been unemployed. Since no survey has satisfactorily overcome the obstacles to obtaining complete and accurate data, there is no conclusive answer to this question.

But as the waiting list grew, it was in the interest of any worker contemplating employment abroad to apply in advance of any potential unemployment. Also, the existence of a queue led to the growth of corruption, queue-jumping practices in certain areas at least. The aspirant migrants have had to pay a bribe to the local OTTEFP official. This system emerged as the average waiting-time prior to departure lengthened substantially. Officially priority was given to workers who were unemployed, married and unemployed, and/or asked for by name.

Workers authorized to emigrate attend a three-day seminar during which they are given information about the social and work environment, labor legislation, and social security system of the receiving country.

In addition to these official channels, recruitment also occurs through other means. Three are noted below.

1. When on home leave, migrants visit relatives and friends in their home villages and may provide information and assistance to potential migrants. This information may in turn increase the propensity of persons in village A to move to place B, where the emigrant is working, rather

than to some other location, C. The more persons who have migrated from A to B in the past, the greater will be the volume of information sent from B back to A, and hence the greater the likelihood that the flow of migrants will be from A to B. The presence in B of relatives and friends from A may in itself increase the propensity of persons in A to move to B.

Relatives and friends may provide the recent migrant with food and shelter until he can find a job, and they may also make the social transition easier. These are undoubtedly some of the reasons why migration is relatively limited from the northern and eastern regions of Tunisia. Fewer persons have migrated from that area in the past, and thus fewer are likely to do so at present and in the future.

2. Employers may offer "individual" work contracts to persons suggested by migrants. Some localities, mainly in the South, have been identified as yielding "good migrants." This individual contract approach is commonly used in France, where migrant workers operate as a placement service and provide many other workers. Eighty-eight percent of the Tunisian migrant workers to France have individual contracts (see Table 3.8). Past migration flows are expected to affect current migration by providing employers in the receiving country with information about relatives and friends willing to migrate.

TABLE 3.7. --Nature of the Migrant Contract, 1971 (Percentage).

| Nature of the Contract | Country of Distinction | | | | |
|------------------------|------------------------|---------|-------|-------------|-----------------|
| | France | Germany | Libya | Netherlands | Other Countries |
| Individual Contracts | 88 | 29 | 46 | 16 | 16 |
| Public Offers | 12 | 71 | 54 | 84 | 84 |
| Total | 100 | 100 | 100 | 100 | 100 |

Source: OTTEFP, Annual Report 1971.

Community feelings and strong family ties between kinfolk, as well as economic reasons, are the forces shaping the migration process. Tijanni Ben Sassi (1968) interviewed 143 Tunisian migrant workers in the Paris area and found that 76 had a relative in Paris who helped them to come to France, 51 had a friend, 5 were sent by the government for a training period, and only 11 came on their own.

3. Whenever there are separate public agencies in the receiving countries to control and administer the recruitment of foreign labor, public offer contracts prevail, as in Germany and the Netherlands (see Table 3.7).

II.5. Remittances

Remittances refer to earnings sent home for family maintenance purposes, as distinct from repatriations from workers' savings abroad. But official data on remittances refer to all foreign exchange repatriated for whatever purpose and cannot be disaggregated to obtain the proportion of each. From the migrant workers' point of view, both savings and remittances require abstinence from current consumption.

According to the data supplied by the Central Bank, remittances amounted to 29.7 million dinars in 1972 (see Table 3.8). They thus represent an important new source of foreign exchange earnings. Their importance may be appreciated when they are compared to the balance of

TABLE 3.8.--Trade Balance, Import of Machinery and Equipment, Debt Servicing Bill and Remittances, 1960-1972 (Million of Tunisian Dinars).

| Year | Trade Balance | | | Equipment (II) | Debt Ser- vicing Bill (III) | Remittances as % of | | | |
|------|---------------|--------|----------------|-------------------|--------------------------------------|---------------------|------|------|-------|
| | Export | Import | Deficit (I) | | | Remittances | | | |
| | | | | | | | I | II | III |
| 1960 | 50.2 | 79.6 | 29.4 | 16.0 | 2.0 | 3.3 | 11.2 | 20.6 | 165.0 |
| 1961 | 46.3 | 86.7 | 40.4 | 18.4 | 1.2 | 2.9 | 7.1 | 15.7 | 242.0 |
| 1962 | 48.7 | 87.9 | 39.2 | 19.7 | 1.6 | 2.2 | 5.6 | 11.1 | 137.0 |
| 1963 | 53.0 | 80.3 | 36.3 | 22.8 | 5.6 | 2.1 | 5.7 | 9.2 | 37.5 |
| 1964 | 57.7 | 106.0 | 48.3 | 31.5 | 10.5 | 2.6 | 5.3 | 8.2 | 24.7 |
| 1965 | 62.9 | 123.2 | 60.3 | 40.6 | 17.5 | 4.8 | 7.9 | 11.8 | 27.4 |
| 1966 | 73.5 | 127.0 | 53.5 | 33.9 | 20.6 | 4.7 | 8.8 | 13.8 | 22.8 |
| 1967 | 78.4 | 137.3 | 58.9 | 29.6 | 30.2 | 5.9 | 10.0 | 19.9 | 19.5 |
| 1968 | 83.1 | 114.4 | 31.3 | 30.4 | 34.4 | 7.7 | 24.6 | 25.3 | 22.3 |
| 1969 | 89.2 | 136.2 | 47.0 | 30.5 | 37.9 | 11.4 | 24.2 | 37.3 | 30.0 |
| 1970 | 98.8 | 154.6 | 55.7 | 38.6 | 36.7 | 15.3 | 27.4 | 39.6 | 41.7 |
| 1971 | 117.2 | 176.0 | 58.8 | 45.0 | 37.5 | 22.8 | 38.7 | 50.6 | 60.8 |
| 1972 | 157.9 | 218.0 | 60.1 | 52.9 | 48.0 | 29.7 | 49.4 | 56.1 | 61.9 |

Source: Statistical Tables, 1960-1971; Fourth Development Plan; Central Bank Annual Reports, 1960 to 1971.

trade, the debt servicing bill, and the import of machinery and equipment. The relative importance has increased with the increase in the number of migrant workers. However, the value of remittances has been affected very much by the exchange rate; from 1961 to 1967 the increase of these remittances was slower than in the last five years because of tight exchange controls and the fact that many emigrants found it more profitable to circumvent these controls. The statistics refer to workers' remittances through official channels, which under present conditions cover only part of overseas transactions. Receipt of repatriated earnings has meant that Tunisia has been able to reduce its dependence on foreign aid more than would otherwise have been the case. This will in time reduce the high level of interest and debt repayments which Tunisia must make each year and which reached 48.0 million dinars in 1972 (see Table 3.9).

A Tunisian migrant worker may be sending about 30 to 40 T.D. a month to his family. Information made available by the Ministère des Transports et Télécommunications provided data for Table 3.10. The average monthly remittance amounts to about 30 T.D. This figure seems the most usual and is confirmed by a confidential report prepared by the Société Tunisienne de Banque (STB) on the average propensity of saving of the Tunisian migrant workers in France and Germany. This report revealed that the interviewed migrant workers (269 persons in France and

TABLE 3.9. --Remittances by Regions, Amount, Average and Per Capita Remittance.

| | Total Amount (in million of T.D.) | | | | | Average (in dinars) | | | Per Capita Regional Remittance in 1972 (in dinars) |
|--------------|--------------------------------------|-------|--------|--------|--------|------------------------|------|------|--|
| | 1968 | 1969 | 1970 | 1971 | 1972 | 1968 | 1969 | 1972 | |
| Gouvernorats | | | | | | | | | |
| Tunis | 1,408 | 1,982 | 2,542 | 3,089 | 3,432 | 27 | 38 | 50.7 | 3.8 |
| Bizerte | 486 | 704 | 951 | 1,298 | 1,620 | 24.6 | 36 | 40 | 4.7 |
| Beja | 94 | 169 | 292 | 401 | 531 | 24 | 36 | 40.2 | 1.7 |
| Jendouba | 235 | 430 | 609 | 773 | 978 | 24.6 | 40 | 38.6 | 3.4 |
| Kef | 277 | 579 | 818 | 878 | 1,080 | 24.8 | 37 | 43.5 | 3.0 |
| Kasserine | 58 | 125 | 192 | 235 | 281 | 23.8 | 39 | 44.6 | 1.1 |
| Gafsa | 45 | 91 | 169 | 221 | 307 | 28.5 | 35 | 44.4 | 0.7 |
| Medenine | 1,346 | 2,210 | 2,707 | 3,776 | 3,157 | 28.8 | 42.6 | 52.5 | 11.3 |
| Gabès | 1,021 | 1,729 | 2,069 | 2,117 | 2,401 | 28.8 | 43.9 | 44.7 | 8.7 |
| Sfax | 173 | 326 | 561 | 660 | 755 | 22.5 | 34 | 42.2 | 3.4 |
| Kairouan | 30 | 69 | 171 | 229 | 323 | 22.5 | 32.5 | 41.4 | 1.0 |
| Sousse | 708 | 1,308 | 1,640 | 1,805 | 2,365 | 23.9 | 38.5 | 43.6 | 3.9 |
| Nabeul | 118 | 213 | 358 | 485 | 654 | 29 | 41 | 46.3 | 1.8 |
| Total | 6,006 | 9,941 | 13,079 | 14,967 | 18,169 | 26.6 | 39.7 | 47.5 | |

Source: Ministère des Transports et Telecommunications.

146 in Germany) were sending about 30 to 40 T.D. (33 percent of their disposable monthly income) per unskilled married migrant worker, while the bachelor migrant workers were sending about 15 T.D. (or 15 percent of their monthly disposable income).

III. The Push and Pull Factors

The migration flows described above have a common essential feature. All are voluntary movements of workers seeking better economic opportunities. They are linked directly to international disparities in the level of income and levels of unemployment. Migration reflects the strength of supply and demand in the labor markets as between two regions. In economic analysis of migration, the major concern has been with the relationship between migration and such variables as income differentials, employment opportunities, and distance.

The economic literature, beginning with G. Ravestein (1885), stated that the flows of migration tend to increase with wage differentials. Belton M. Fleischer (1963), in an analysis of annual and quarterly fluctuations of Puerto Rican migrant workers to the United States from 1946-1958, found that the unemployment differential was the main factor explaining the fluctuations in migration. The inclusion of wages in the model did not contribute to an explanation of the annual and quarterly fluctuations of the Puerto Rican migration. John Vanderkamp (1971), in a

study of Canadian internal migration, found that, although wage differentials had a positive effect on the volume of migration and the unemployment rate a negative effect, the unemployment rate had greater explanatory power.

A review of received theory on migration, therefore, suggests that a suitable model to describe the net flow of migrant workers into each receiving country might contain the following independent variables:

$$M_t = F \left[E_{Dt}, (Y_D - Y_O)_t, D_t \right] \quad (3.1)$$

where:

M_t = the total flow of migrants in the country of destination each year;

E_{Dt} = the level of unemployment in the country of destination for the corresponding year;

$(Y_D - Y_O)_t$ = the real earning differential between the country of destination and the country of origin; and

D_t = the distance between the receiving country and the country supplying labor.

But data to test the model described by equation (3.1) are not available, especially to test which one of the three independent variables, U_{Dt} , $(Y_D - Y_O)_t$, and E_{Dt} , has greater explanatory power. The approach followed in this section aims at investigating separately some aspects of the "push" and "pull" forces.

III.1. The Push Factor

At the national level, there is no doubt that over-employment and unemployment in Tunisia contributed to "push" Tunisians out of their country into employment abroad. We would expect regional outflows of Tunisian migrant workers to foreign countries to be positively related to the regional unemployment rate, X_i . The rate of emigration M_i from region ($i = 1, 2, 3, \dots, 13$) is higher, the lower the level of employment in that region. We define the rate of emigration, M_i , as the ratio of the number of emigrants from region i to the total male population in the age bracket 15 to 64 years, plus the emigrants in region i . According to this model, the most under-developed regions should provide the highest rates of emigration. But, here again, the lack of data about the regional distribution prior to the departure of migrant workers to the foreign countries is a problem, so we have proceeded on the basis of two approaches. The first is that used by the Ministry of Planning, which relies on the official departures from the 13 regions as they are provided by the OTTEFP (Estimate 1 in Table 3.10). The second is to estimate a regional distribution prior to departure from the regional distribution of the flow of remittance as provided by the Ministry of Telecommunications. We believe that this method is more adequate, especially since a regional study done by Mahmoud Seklani

TABLE 3.10.--Migrant Workers by Area of Origin 1964-1973.

| Gouvernorats | OTTEFP Data | | | | | | | Estimate I | | | Estimate II | | |
|--------------|-------------|-------|--------|--------|--------|--------|--------|------------|------|---|-------------|------|---|
| | 1964/68 | 1969 | 1970 | 1971 | 1972 | 1973 | Total | Nb | % | % | Nb | % | % |
| | | | | | | | | | | | | | |
| Tunis | 4,080 | 1,472 | 4,445 | 4,100 | 3,623 | 3,234 | 20,954 | 29,000 | 21.4 | | 32,232 | 16.8 | |
| Bizerte | 1,262 | 737 | 1,124 | 1,220 | 1,172 | 1,127 | 6,642 | 11,500 | 8.5 | | 20,145 | 10.5 | |
| Beja | 605 | 386 | 495 | 591 | 607 | 842 | 3,526 | 4,800 | 3.6 | | 5,756 | 3.0 | |
| Jendouba | 1,032 | 648 | 940 | 951 | 960 | 1,412 | 5,943 | 6,700 | 5.0 | | 12,471 | 6.5 | |
| Kef | 736 | 305 | 650 | 840 | 724 | 680 | 3,935 | 6,600 | 4.9 | | 12,854 | 6.6 | |
| Kasserine | 429 | 255 | 282 | 504 | 398 | 620 | 2,488 | 3,000 | 2.2 | | 2,686 | 1.4 | |
| Gafsa | 310 | 165 | 278 | 336 | 386 | 341 | 1,812 | 3,000 | 2.2 | | 2,878 | 1.5 | |
| Medenine | 960 | 499 | 753 | 1,101 | 1,397 | 2,902 | 7,702 | 17,700 | 31.1 | | 34,152 | 17.8 | |
| Gabes | 946 | 1,007 | 600 | 727 | 1,322 | 1,558 | 6,160 | 13,800 | 10.2 | | 26,840 | 14.0 | |
| Sfax | 1,180 | 706 | 1,096 | 1,096 | 1,202 | 2,093 | 7,367 | 10,500 | 7.8 | | 7,674 | 4.0 | |
| Kairouan | 413 | 277 | 394 | 365 | 646 | 805 | 2,900 | 3,700 | 2.7 | | 2,878 | 1.5 | |
| Sousse | 1,962 | 947 | 1,898 | 1,978 | 2,862 | 2,271 | 11,918 | 18,400 | 13.7 | | 26,284 | 13.7 | |
| Nabeul | 856 | 436 | 835 | 855 | 1,024 | 1,971 | 4,977 | 6,300 | 4.7 | | 4,988 | 2.6 | |
| Total | 14,477 | 7,840 | 13,790 | 14,658 | 16,319 | 18,946 | 86,329 | 135,000 | 100 | | 191,858 | 100 | |

Source: OTTEFP, 1971 Annual Report.

of the Governorate of Medenine, for example, estimates the number of emigrants from Medenine to be around 30,000 persons; and this estimate corresponds to that of 34,152 persons migrating from this governorate (Estimate II in Table 3.10) when remittance computations are used. Although these two approaches are not strictly comparable, they tell the same story. The most underdeveloped, southern regions have had a dominant share throughout, not only absolutely, but also relatively, in the sense that their share in supplying migrants exceeds their share in the total population.

For the regional distribution of employment, the variable E_i ($i = 1, 2, 3, \dots, 13$) in equation (3.2), the figures used are drawn from the 1971 Annual Industrial Survey. We added to the persons employed in the industrial sector the regional estimates of equivalent full-time man-days in agricultural employment. This estimate of regional employment corresponds to column I (a) in Table 3.11. A second estimate was to subtract from the total agricultural employment 20 percent, representing female labor employment in agriculture. These figures are given in column I (b) in Table 3.11.

We have also used a second independent variable, R_i ($i = 1, 2, \dots, 13$) which is the percentage of the number of households receiving less than 30 T.D. a month in region i . Variable R_i represents a rough approximation

TABLE 3.11.--Regional Distribution of Employment and Male Labor Force (15-64 Years Cohort).

| Gouvernorats | Employment | | Male Labor Force | | Agriculture Employment Adjusted ⁵ | Employment Male Labor Force | | |
|--------------|------------------------------|-------------------------------|------------------|---------------------------------------|--|---------------------------------|-------|------------|
| | Indus- trial ¹ | Agricul- ture ² | Total | Popula- tion ³ (000) | | Emigrants ⁴ (000) | Total | I (a) % |
| Tunis | 65,841 | 20,117 | 85,958 | 288.4 | 29.0 | 317.0 | 27.0 | 26.0 |
| Bizerte | 7,874 | 35,546 | 43,420 | 81.2 | 11.5 | 92.7 | 46.8 | 40.4 |
| Beja | 2,197 | 23,442 | 25,639 | 73.4 | 4.8 | 78.2 | 32.7 | 30.1 |
| Jendouba | 2,543 | 14,227 | 16,770 | 67.2 | 6.7 | 73.9 | 22.6 | 16.4 |
| Kef | 4,312 | 18,175 | 21,487 | 82.1 | 6.6 | 88.7 | 24.2 | 21.9 |
| Kasserine | 1,496 | 14,972 | 16,468 | 56.4 | 3.0 | 59.4 | 27.7 | 22.8 |
| Gafsa | 11,066 | 30,699 | 41,765 | 86.3 | 3.0 | 89.3 | 46.7 | 41.0 |
| Medenine | 801 | 15,000 | 15,801 | 55.0 | 17.7 | 72.7 | 21.7 | 18.2 |
| Gabes | 1,820 | 22,628 | 24,448 | 49.5 | 13.8 | 62.3 | 38.6 | 32.6 |
| Sfax | 10,498 | 42,028 | 52,581 | 110.5 | 10.5 | 121.0 | 43.4 | 37.6 |
| Kairouan | 821 | 23,398 | 24,219 | 75.1 | 3.7 | 78.8 | 30.7 | 25.7 |
| Sousse | 11,672 | 20,992 | 32,664 | 128.4 | 18.4 | 146.8 | 22.2 | 19.8 |
| Nabeul | 3,050 | 38,622 | 41,672 | 79.1 | 6.3 | 85.4 | 48.7 | 41.2 |

Sources:

¹ Recensement des Activites Industrielles 1971.

² Equivalent man-days agriculture employment. G8; Villes et development. Tunis, 1973.

³ Ministère du Plan.

⁴ Ministère du Plan.

⁵ Adjustment was made to take into account the female employment (subtract 20% from the Total Agriculture Employment data).

of the poverty level in each of the 13 regions. These figures were derived from a national survey of households conducted in 1968.⁵

Therefore, the complete model to be tested is:

$$M_i = a + bE_i + cR_i. \quad (3.2)$$

The relatively highest correlation coefficients we obtained were as follows:

(1) by using estimates I in Table 3.10 and I(b) in Table 3.10, the least squares estimate yields

$$M = 7.55 - .163 E + .402 R, \quad (3.3)$$

(.277) (.274)

with ($R^2 = .223$ and $F = 1.438$);

(2) by using estimate II in Table 3.10 and estimate I(b) in Table 3.11, we obtain

$$M = 20,195 - .543 E + .501 R, \quad (3.4)$$

(.366) (.379)

with ($R^2 = .358$ and $F = 2.79$).

However, these are poor estimates, especially if we consider the following: We did not take into account the regional distribution of employment in the service sector. [We may note that 20.8 percent of the employed persons were in the service sector in 1972 (Table 2.5)];

⁵Secretariat d'Etat au Plan et a l'Economie Nationale La Consommation et les Depenses de Menages en Tunisie, 1965-1968. Tunis: December 1968.

(2) the Annual Industrial Survey covers about 50 to 70 percent of total industrial employment; (3) handicraft employment was not taken into account; and (4) the regional flows of emigrant workers are only estimates of the total emigrant population.

Even on this tentative basis, the model of equation (3.2) provides some useful information on the migration process by showing that the income variable R_i has little effect and the employment variable E_i considerably more effect on the process of migration. It is necessary to reiterate that these results give no more than an initial insight into the causes of migration.

III.2. The Pull Factor

International differences in wages go far in explaining the geographical mobility of labor. Economic efficiency requires that resources in general, and labor in particular, should move in response to wage differentials. These differentials between regions or countries, except for an allowance made for transportation and other moving expenses, are mainly due to (1) the existence of different endowments of capital and labor and, therefore, different capital-labor ratios; (2) technological innovations in the industrialized countries of a labor-saving nature, which increase the marginal productivity and, therefore, wages of labor; and (3) imperfections such as lack of information and immobility of labor.

There are a number of reasons why information on earnings differentials between labor-exporting and labor-receiving countries is important. First, although the differentials are generally acknowledged to be substantial, the order of magnitudes is not always made explicit. Second, the expectation of higher earnings, a main motive for migration, depends on the wage differentials between the region of origin and the region of destination and the probability that the potential emigrant will secure a job. Since Tunisian migrant workers leave the country either by accepting public offer contracts or by relying on some of their relatives or friends to get them a job, we will assume that the probability of obtaining employment in the country of immigration is equal to one.

On the basis of this assumption, we computed the expected income in French francs of the migrant workers to France, using statistics on the hourly wage rate of 1972 for 12 economic sectors and 4 levels of qualification (unskilled, semi-skilled, and skilled workers and technicians), assuming a 45-hour work-week. One may wonder, for example, whether many immigrant workers do not achieve "artificial parity" with their French coworkers of the same skill level by working much more overtime than they do. But the results of a survey show that immigrants have a

TABLE 3.12.--Monthly Average Wages in France and Tunisia for Four Occupational Categories and Twelve Sectors for 1972 (in French francs).

| Sectors | Unskilled | | | Semi-Skilled | | | Skilled | | | Technicians | | |
|---|-----------|-----|-----|--------------|-----|-----|---------|-----|-----|-------------|-------|------|
| | MGF | MGT | AD | MGF | MGT | AD | MGF | MGT | AD | MGF | MGT | AD |
| Mining and Quarrying | 1,010 | 379 | 631 | 1,152 | 379 | 773 | 1,371 | 884 | 486 | 1,762 | 1,222 | 540 |
| Food, Beverage and Tobacco | 961 | 351 | 610 | 1,131 | 468 | 664 | 1,272 | 480 | 792 | 1,458 | 832 | 626 |
| Construction Materials, Ceramics and Glass | 927 | 325 | 602 | 1,087 | 312 | 775 | 1,218 | 805 | 413 | 1,427 | 845 | 582 |
| Mechanical and Electrical Industries | 1,003 | 300 | 703 | 1,148 | 402 | 746 | 1,362 | 520 | 842 | 1,702 | 949 | 753 |
| Chemical Industries | 921 | 285 | 636 | 1,161 | 455 | 706 | 1,319 | 662 | 657 | 1,582 | 1,052 | 530 |
| Textile, Clothing and Leather | 972 | 351 | 621 | 1,199 | 468 | 731 | 1,404 | 480 | 924 | 1,607 | 832 | 772 |
| Wood and Furnishings | 959 | 233 | 726 | 1,168 | 272 | 896 | 1,354 | 468 | 886 | 1,512 | 645 | 867 |
| Paper and Other Industries | 1,027 | 338 | 689 | 1,287 | 351 | 936 | 1,494 | 546 | 948 | 1,755 | 1,014 | 741 |
| Construction | 923 | 253 | 670 | 1,121 | 481 | 640 | 1,296 | 533 | 763 | 1,490 | 1,351 | 139 |
| Transportation | 945 | 338 | 607 | 1,121 | 416 | 705 | 1,263 | 844 | 419 | 1,501 | 1,677 | -176 |
| Commerce | 968 | 338 | 630 | 1,157 | 402 | 755 | 1,330 | 520 | 810 | 1,544 | 961 | 583 |
| Other Services | 857 | 273 | 584 | 1,013 | 356 | 657 | 1,128 | 456 | 672 | 1,305 | 911 | 394 |

Key to the Table:

MGF--Monthly Wages in France
MGT--Monthly Wages in Tunisia
AD--Absolute Differences

working week ranging from 44 to 47 hours,⁶ and it is not apparent that foreigners worked longer hours than nationals.

It should be noted that we assume that no wage discrimination is made against migrant Tunisian workers in France. Officially recruited migrant workers abroad receive the going rate for whatever job they are doing. Relying on a sample of 1,722 migrant wage earners holding a job in 1970,⁷ it seems that immigrants--chiefly unskilled, semi-skilled, and skilled workers distributed over various industries but mainly in construction and the metal working industries--do not seem to be at too great a disadvantage in relation to other workers employed in France at the same skill level.

Using the 1972 survey on wages for the private sector in Tunisia, we increased all monthly disposable wages for the 4 levels of skill and for the 12 economic sectors by 17 percent. This increase represents the average percentage paid by workers for income tax and social security out of their monthly wages. At this stage, we will interpret wage differentials narrowly as money-wage differentials by converting these figures into French francs at the official exchange rate for 1972 (1 T.D. = 10.74 F.F.). A broader interpretation of wage differentials

⁶ Rene Granier and Jean Pierre Marciano. The Earnings of Immigrant Workers in France. International Labor Review 104 (Feb. 1975):143-65.

⁷ Ibid.

that takes into account not only cost of living differences but also differentials in the availability of various amenities will be given in Chapter IV.

CHAPTER IV

THE COST-BENEFIT MODEL

The migration literature has in general been strongly biased toward examining the determinants of migration, but it is almost completely devoid of direct policy implications. The development of the concept of human capital has allowed a more rigorous analysis of the consequences of the international brain drain, and this analysis applies almost equally well to a theoretical examination of the expected consequences of international migration of workers. The economic effects on Tunisia of supplying workers to the economically more developed European countries during the period 1964-1973 are investigated in this chapter. The judgment as to whether the flow of migrant workers should be encouraged or discouraged is one that cannot be arrived at without an understanding of the factual basis of the phenomenon.

The determination of an optimum emigration policy through a general equilibrium framework is rejected in favor of a simpler partial cost-benefit model for several reasons. First, the most relevant statistics are not

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available. Second, the Tunisian domestic economy has not yet been sufficiently quantified to enable the identification of the domestic output and growth effects of emigration. Third, the rate of the outflow of emigrants is not of a scale which would invalidate the cost-benefit approach.

After a brief review of the economic literature dealing with cost-benefit analysis and migration, we will discuss some conceptual issues relevant to the specific model under consideration. We will then set up a framework of analysis, keeping in mind two decision makers: the individual and society. International migration will be treated as a type of human capital formation, that is, as an investment of time and resources in the present which will increase productive capacity in the future.

I. Review of Literature

In the last few years, there has been a spate of writings, primarily in the United States, on the problem of migration as a human capital process. However, the treatment of migration as a human capital component is not new. Some of the objectives of treating human beings as capital were to determine the effect of investment in education, health, and migration or to estimate the total loss that a country could incur from war. As it appears from a study by B. Frazier Kiker (1966), a debate between

Friedrich Kapp (1870), Charles L. Brece (1870), and Richmond Mayo-Smith (1895) on the monetary value of immigrants to the United States concluded that immigration was economically profitable to the host country. The objective being maximized was national, namely, the military and economic power of the nation.

In reviewing the more recent economic literature on migration which takes the human capital approach, we must distinguish between three groups: (1) highly skilled workers who are dealt with generally as part of the brain drain problem; (2) workers involved in interstate migration; and (3) other workers involved in international migration.

I.1. The Brain-Drain

The concept of the brain drain is nationalistic in origin, stemming from the anxiety aroused in developing countries that their more highly qualified persons attracted to the more developed nations. There is no question that these latter gain from the brain drain. They acquire additional human capital stock at lower cost than if they had to rely on domestic supply.

Herbert G. Grubel and Anthony D. Scott (1966) have focused on the international migration of human capital and on arguments concerning the brain drain. In their work they emphasize the effects of out-migration on social welfare. They suggest a distinction between

aggregative national losses and losses implying a deterioration in economic welfare of the individuals comprising the nation because of the brain drain. For Grubel and Scott, a country is an association of individuals. The most important determinant of welfare in the long run is the standard of living, identified as the per capita income of all initial residents, whatever their place of residence after migration. Emigration should be welcomed whenever two conditions are met: the emigrant improves his own income; and the migrant's departure does not reduce the income of those remaining behind.

The appropriate questions to ask, then, are whether the emigrants give rise to external economies, whether the remaining workers and other factors of production could substitute for the emigrating, and whether the consumption of those remaining of subsidized collectively produced services exceeds their tax contributions. However appealing their welfare measure may be, it is not surprising that, because of the lack of data, Grubel and Scott ultimately make no attempt at direct empirical assessments.

Harry G. Johnson (1968) builds the analysis of Grubel and Scott by adding another dimension to the debate: the cosmopolitan liberal point of view. The international migration of educated people is beneficial process, since it results from the free choices of the individuals. It would contribute to an increase in world output if

provisions were made for any tax loss and adjustment costs. Johnson points out that the country that loses persons whose education has been financed by local taxation also loses the right to tax the higher incomes made possible by the education and is therefore unable to recoup the costs of its educational investment. If education results in the production of new knowledge that now accrues elsewhere because of migration, production functions in sending and receiving areas might be affected. However, to the extent that new knowledge is freely transferable between regions, it makes no difference where the educated person resides.

I.2. The Interstate Migration

Interstate emigration studies focus on labor mobility between different states in one country, primarily the United States. The interest is to form an analytical framework for human capital by devising methods for estimating and identifying private and public costs and returns to migration.

In a 1962 article, Larry A. Sjaastad examined migration primarily as a form of private rational decision making. Migration may be considered within a general model of investment in human capital. People will move if they can increase the present value of their earnings stream by an amount greater than the cost of moving. In a careful

consideration of these costs and returns, Sjaastad has pointed out that more than direct costs and returns are involved. Costs are divided into money and non-money costs, the latter including opportunity costs as well as psychic costs. Opportunity costs consist of transportation costs, costs of job search, and the income a migrant could have earned if he did not move. Sjaastad, then argues that since psychic costs (reluctance to leave family and friends) do not use up real resources, the appropriate formulation of migration models should consider only the money costs.

Burton Weisbrod (1964) uses Sjaastad's base and sets up a model in which the community is treated as a decision-making unit analogous to the individual decision maker of the microeconomic theory, who receives benefits and incurs costs. Weisbrod is concerned about how migration will affect the benefits that a community is presumed to receive from investment in education. Along the same line, Hans J. Bodenhöfer (1967) treats migration by developing Sjaastad's model further.

Samuel Bowles (1970) tested Sjaastad's approach empirically, and his findings confirm that the pattern of geographical mobility of workers may be explained by an investment approach, stipulating that individuals consider the benefits and costs of moving. The costs of migration are less than the differential in the present value of the streams of earnings in two different places.

Another empirical test was made by Alden Speare, Jr. (1968), in a cost-benefit analysis model applied to rural-urban migration in Taiwan. He compares the present value of the stream of private benefits against private costs, but the analysis was tested only for one decision maker, the migrants.

I.3. International Migration of Workers

The economic study of international migration cannot ignore the contribution, although the emphasis is not on a human capital approach, made by Brinley Thomas (1973). In a second edition of a 1954 essay, he presents evidence to support the hypothesis that the respective economies of the "periphery" (especially the United States) and of Great Britain experienced long-run trends in population movements, capital formation, export booms, and so forth, which were causally and inversely related. According to Thomas's evidence, overseas migration and foreign lending fluctuated together, and they bore a significant relation to the rate of capital formation in the sending and receiving countries. There was a long-run community of interest which expressed itself in an inverse relation between the rate of capital construction in Great Britain and the countries of new settlement overseas. These fluctuations or long swings in migration and capital exports had a span corresponding to that of the building

cycle, upswings and downturns in construction in the receiving countries, and in Great Britain, moving in opposite directions.

Solomon Barkin (1967), also working from Sjaastad's model, considers the costs and benefits of international migration of workers with respect to three centers of decision making: the individual, the enterprise, and the nation. He expands the analysis to include the effects of migration on the home country, such as the supply of skilled workers, the impact on urbanization, inflationary effects, and the economic behavior of the citizens remaining behind. All these factors are not susceptible to numerical evaluation.

Leonard S. Miller (1967), in an unpublished doctoral dissertation, tries to evaluate the effects of Greek migrant workers to the rest of Europe. He formulates an econometric cost-benefit model for two welfare functions, the "nation-qua-nation" view, or how the productivity of the nation changes due to emigration, and the "nation-qua-people" view, or how the national income of the people remaining behind changes due to emigration.

The emigrants' remittances constitute the benefit side in both measures. The results show that the present value of the net benefits is positive. However, two main criticisms could be advanced: Miller treats labor as homogeneous, but we know that migration is a very selective

process, and emigrants are not a random sample of the population; and Miller regards the output of the country as a single commodity produced in a constant return to scale production function. We may question the validity of this procedure because of limited opportunities for technical substitution in LDCs.

More recently, in a useful and important book, Suzanne Paine (1974) studies the Turkish experience. Most of the book is given over to a detailed analysis of migrant workers in terms of demographic, regional, and occupational characteristics, both abroad and upon returning home. Her thesis is that the export of workers to gain employment and foreign exchange is costless. Paine lists a set of criteria for examining the total impact of labor migration on the Turkish economy, and she maintains that Turkey's labor export policy has had many positive benefits and almost no negative side effects on the economy. There is no evidence that either industrial or agricultural output suffered, and there is also no evidence that inflows of remittances and savings added to Turkish inflation. But Paine's main findings and conclusions are inadequately developed and do not seem to be supported by any empirical evidence.

From the above discussion of recent work it is evident that the analysis of migration in human investment terms has opened up along a wide front. There are common elements and sharp distinctions in terms of focus,

theoretical frameworks applied, and the kinds of compromises made when faced with incomplete and sometimes unavailable data. But not one study attempted to evaluate international migration in as concise and systematic a framework of cost-benefit analysis as has been developed in manpower studies in the United States. The identification of a conceptually appropriate testable cost-benefit model will be developed in the third section of this chapter, but first some conceptual issues in cost-benefit analysis must be clarified.

II. Conceptual Issues in Cost-Benefit Analysis

The price of learning from trial and error is very high. In choosing among alternative courses of actions, people have found it advantageous to think about the consequences of alternative policies, rather than to choose among them by flipping coins alone. They use models of the real situation to assist them in predicting those consequences.

As defined by Ralph Turvey and Alan R. Prest

(1965):

Cost-benefit analysis is a practical way of assessing the desirability of projects where it is important to take a long view (in the sense of looking at repercussions in the future, as well as in the nearer future) and a wide view (in the sense of allowing for side effects for many kinds on many persons, industries, regions, etc.), i.e., it implies the enumeration and evaluation of all relevant costs and benefits.

This formulation is very general, but it allows us to set out a series of questions: (1) Which costs and which benefits are to be included? (2) How are they to be valued? (3) How far into the future should one look? Any evaluation of costs and benefits presupposes an objective function to be defined for each of the two decision makers, the society and the individual. The list of costs and benefits is not the same for each, nor is the relative importance attached to each by the two centers of decisions the same.

Our decision rule will be to select the project with the highest present value of benefits over costs, the benefit-cost ratio (BCR) is:

$$BCR = \frac{B}{C}, \quad (4.1)$$

where B is the present value of benefits and C the present value of costs. The payoff for any investment does not arise in a single year. It continues over several years, throughout one's working lifetime. This extra income expected two, five, ten or twenty years from now is certainly not equivalent to income today and therefore cannot be simply added to extra income expected immediately. To account for this fact, that income in the present is worth more than income in the future, we employ the present value concept, which assigns lesser importance to income the further into the future it is expected. If the stream

of benefits is $B_1, B_2 \dots, B_t$, the present value of the stream is simply the discounted sum of this stream, the discounting being done at the appropriate rate of interest, i . Representing the present value of benefits (PVB) at i , we obtain

$$PVB = \sum_t \frac{B_t}{(1+i)^t}, \quad (4.2)$$

where t is the number of years spanned by the analysis. We can also define the present value of costs at i by

$$PVC = \sum_t \frac{C_t}{(1+i)^t}, \quad (4.3)$$

If BCR is negative, then the particular activity is unprofitable in an absolute sense, that is, idleness of the resources is better than the particular activity. If BCR is positive, but less than one, it is better to undertake the particular activity than to leave the resources idle. If BCR is superior to one, there is a *prima facie* presumption that the undertaking is an economic one. Economic gains are achieved since benefits exceed the value of the resources used.

The problem of defining costs and benefits and their pricing for each of the two decision makers is left to section III of this chapter.

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II.1. The Discount Rate

In order to compare benefits and costs which are spread over several years, they must be expressed in comparable values. In a perfectly competitive economy there would be only one interest rate for all risk-free loans of any given maturity. This interest rate would be faced in a free market by all savers and investors. But no economy has one single capital market because (1) different rates of taxation exist among activities. Taxation "siphons off" part of the returns to the government (William J. Baumol 1968); and (2) there are impediments, such as monopoly, to the influx of capital into some productive activities. The problem is then to decide on the rate that best reflects the situation in the country and is the best yardstick for the analysis.

II.1.1. The Discount Rate for the Individual.--

Individuals face a number of different interest rates depending upon the uses of the loan and upon the amount to be borrowed. The borrowing rate frequently exceeds the lending rate, even for the same individual and for the same purpose, by as much as 3 or 4 percent. In general, it has been agreed in the manpower studies that two possible measures of time preference could be used as discount rates. The first is a rate which would be the return the individual would receive on his savings. As shown in

Table 4.1, the two interest rates relevant to our subsequent analysis are 4.5 percent and 6 percent. The second is a rate that the individual would have to pay to borrow the discounted value of the benefits. In this case, for Tunisia, the interest rate varies between 8-12 percent.

Therefore, for the individual three discount rates will be employed here: 4, 6, and 12 percent. These reflect the differences among individuals as to rates of time preference as well as investment opportunities they consider applicable to them.

II.1.2. The Discount Rate for Society. --Recent contributions to the literature on the discount rate for the government and for society are converging to the view that the appropriate discount rate to be used in evaluating any public project lies between the marginal productivity of private investment and the social rate of time preference. But how does cost-benefit analysis in practice tackle this problem?

In equilibrium, the marginal productivity of investment is the rate of return in alternative uses of the resources utilized for a specific use. The social rate of time preference is the rate at which society is prepared to postpone consumption from the present to the future. It measures the degree of the society's preference for present over future consumption. It is a normative rate, reflecting the government's relative evaluation

TABLE 4.1.--Interest Rates in Tunisia (Percentage).

| | Rates |
|--|-------|
| <u>On Savings:</u> | |
| Saving Deposits, for less than 12 months | 3.0 |
| Saving Deposits, for less than 18 months | 4.5 |
| Saving Deposits, for more than 24 months | 6.0 |
| On Government Bonds | 5.0 |
| <u>Other Creditor Rates for:</u> | |
| Agriculture Equipment | 8.0 |
| Construction for Housing | 5.5 |
| Tourist Investment | 8.0 |
| Investment for Public Firms | 8.0 |
| Industrial Equipment | 8.0 |
| Others | 8.0 |

Source: Banque Centrale de Tunisie, Statistiques, Financieres, Juin 1974.

of the desirability of consumption at different points in time. A theoretical foundation can be provided for planners' optimal time preferences, based on the notion of the diminishing marginal utility of individual income. If we assume that this marginal utility falls, then the value of the marginal output falls as per capita income rises. Since this social discount rate is designed to reflect the relative value of marginal output at different points in time, this rate should be lower, the smaller the expected increase in per capita output. There is no generally agreed upon empirical basis for deriving it, although it is implicit in theoretical models of growth and functions which postulate the marginal utility of consumption over time.

In practice, cost-benefit analysis takes the rate at which the government borrows as being representative of a risk-free rate, because there is little risk of the government defaulting on its own obligations. But, as noted by Martin S. Feldstein (1964), "all market rates, including the government borrowing rate, contain an element of risk premium" because all bonds are subject to two types of uncertainties. These are variations in market prices or asset value and changes in the purchasing power of money.

Otto Ekstein (1956) estimates that the social rate of time preference is between 3 and 5 percent, but, he argues that it should be higher--about 10 percent--for an economy which needs capital urgently.

William Baumol (1968) advocates a weighted average for the opportunity cost rate of the various sectors. A United Nations Report (1966) states that,

Because of the achievement of higher rates of growth of income, the developing countries should ensure an appreciable level of welfare for future generations. Therefore, the time preference for the present generation for immediate rather than postponed consumption should be reflected in a discount rate of about 10 per cent.

Most studies in the manpower area which calculate present values use a 10 percent discount rate to calculate social benefits.¹

Two more problems concerning the discount rate must be dealt with, the problem of uncertainties and the changes in the discount rate.

Uncertainties arise from (1) the asset's life, its rate of depreciation, and its maintenance costs; (2) the response of other decision makers; and (3) some other variables affecting the outcome which are not fully controllable, such as technological change and political events.

Expenditure criteria must take some cognizance of the risky and uncertain nature of the economic world. Unfortunately, welfare economics has no complete apparatus for dealing with risk. The traditional adjustment for risk has often taken three forms: (1) contingency

¹For the evaluation of training programs, see Borus (1964) 5-10 percent; Hardin and Borus (1972) 5-10 percent. For studies on population control, see S. Enke (1960) 10 percent; and G. Zaiden (1972) 10-15 percent.

allowances, which arbitrarily raise certain categories of costs by a certain percentage or reduce benefits through price assumptions which are below expected prices; (2) a limit to economic life shorter than physical life; and (3) a risk premium from .5 to 1 percent in the interest rate, as is proposed by Otto Ekstein (1958). These crude adjustments are intellectually not very satisfying, but the state of the arts in economics does not provide a better solution.

Changes in the discount rate may also be due to the operation of basic secular forces or year-to-year influences. Funds might be scarce one year and relatively abundant in subsequent years, and trends may imply a rate of labor growth and shift toward or away from capital-intensive industries. The way to deal with this problem has been to get a discount rate somewhere near the historical average. George Stigler (1960) finds that the private rate of return to capital in U.S. manufacturing by the late 1950s was approximately at the same level as that of the late 1920s.

We choose here a rate of 5 percent, which is assumed to represent the long-term rate at which the government can borrow. A 10 and 20 percent rate would represent higher rates of time preference. These three rates approximate the limits of the range of rates which have been used or suggested in other studies. This would

also allow us to indicate how sensitive the capitalized values are to a high discount rate.

II.2. The Time Stream

How far into the future should one look? The time horizon means the length of time over which costs and benefits are estimated and beyond which one cannot see well enough to make estimates worthwhile.

Once more, this involves a subjective evaluation which depends upon the policy maker's attitude toward uncertainty. Temporary migration has been the predominant form of European labor inflows in the post war period. Some knowledge of the length of time which Tunisian migrants spend in the receiving countries is important to set up the number of years for a relevant course of action. Statistics on the subject are scanty. It is reported in a German survey that Tunisian migrant workers stay abroad for only short periods. However, here we assume that Tunisian migrants will stay abroad for two, five, or ten years. After ten years, we assume that the migrant would settle permanently in the receiving country, his living secured.

II.3. International Comparisons of Income

It is well known that official exchange rates are not suitable as conversion factors for international

comparisons in real terms of all economic flows. Exchange rates are not indicators of over-all purchasing power parities; at best they only relate to equilibrium in foreign transactions. Several methodological and conceptual issues arise in attempting to compare the wages in one country with those of another. For any given year, the question arises whether conversion of the present value derived in Tunisian dinars (T.D.) into French francs (F.F.) at the official exchange rate (1 T.D. = 10.95 F.F.) is valid. The official exchange rate does not reflect the relative purchasing power of different currencies, and thus errors are introduced into the comparisons. These errors often may be small, as is probably the case in comparisons between the currencies of the United States and Canada, but they can be quite large when comparing between the currencies of LDCs and the United States (Milton Gilbert and Irving B. Kravis, 1956).

Even if the exchange rate is appropriately valued, the conversion does not necessarily give a true reflection of relative purchasing power. This is so for several reasons. First, the official exchange rate may differ from the equilibrium rate required to keep a country's trade in balance. Second, the equivalence for internationally traded goods, between the internal prices of traded goods and exchange rates, is prevented by barriers to trade in the form of tariffs and transportation costs. Third,

even if the prices of internationally traded goods were approximately the same as exchange rates, the final prices to domestic buyers would certainly differ widely because of differences in the margins added for net indirect taxes, domestic processing, internal transportation, and distribution costs. Finally, the relative price ratios of different commodities and hence their role in the typical consumption basket are different between developed and developing countries, for example, industrial luxuries--cars, radios, televisions, and the like--tend to be expensive in poor nations, but comparatively abundant in developed countries, where they are more common and perhaps even necessary in consumption.

These difficulties in income comparisons have led statisticians and economists to construct comparisons between countries at a common set of prices. But the formulation and interpretation of these numbers involve serious statistical and conceptual problems which we will now examine by reviewing the literature. The focus of interest is mainly on the relative level of real wages and working class consumption.

The United Nations has been preparing retail price comparisons for purposes of international salary determination. The study is explicitly limited to providing the basis for adjusting the salaries of international civil servants working in different countries of the world.

EEC studies have been aimed at providing estimates of the relative real incomes of selected categories of the population, namely, workers in the coal and steel industry of the member countries. For this purpose, the studies have carefully measured both the incomes of the different categories of workers and the purchasing power parities of the typical baskets of goods consumed by these workers.

Wilfred Beckerman (1967) has been developing a method to find the "best" statistical relationship between relative real income or consumption and selected nonmonetary indicators for which data are readily available in most countries.

Dan Usher (1963, 1965 and 1966) attempted to find the purchasing power parity, corresponding to what he called "social needs," in Thailand in order to make a comparison at U.K. prices between British and Thai standards of living. He prices the various items covered at British prices only. The reason he gives for this is that for such comparisons it is better to use the price of the more developed country, since this will give less weight to luxuries, and it is in luxuries that the developed country has the most favorable quantity ratio.

Gopal C. Dorai (1972), in his empirical analysis of the brain drain from India, converts the monetary value of expected income in India in terms of real purchasing power equivalence in the United States. He makes use of

the UN's retail price index. This method could be applied only for people having the same or similar consumption patterns as the UN officials working in various countries. This method cannot be applied to the income of migrant workers, since these workers have a very different consumption pattern than that of UN officials.

Irving B. Kravis (1975) directed a team study of international comparisons of GDP and purchasing power. An important part of the study is methodological. This sort of inquiry requires not only considerable resources of skilled personnel, but also a full understanding of the conceptual issues involved in separating differences in quality with an imputed value from other differences in quality. The preferred method was to find goods that were physically identical in each of the ten countries covered by the study. More usually, however, exactly identical commodities could not be found, and there is also the problem of "unique goods," defined as those available only in one of the countries in a binary comparison. The unique goods problem looms larger and appears on both sides in comparisons between developed and developing countries. It must also be pointed out that on the statistical side the estimates are based upon necessarily limited sets of observations.

Since we do not know by how much the conversion at the official exchange rate is different from the real

purchasing power parity; and since we cannot make cardinal comparisons, we will overcome this difficulty by starting with the exchange rate in a period which appears closer to a market equilibrium. We will compute the purchasing power parity to the 1972 period on the basis of relative changes in the price indexes of Tunisia and France. If we define the actual price of foreign currency in 1963 to be 1 Tunisian dinar equals 10.95 French francs, the theoretical price of foreign currency in 1972 would be equal to:

Theoretical Price in 1972 =

$$\text{Actual Price in 1963} \times \frac{P_T}{P_F}, \quad (4.4)$$

where P_T is the ratio of the price level in Tunisia in 1972 to the price level in Tunisia in 1963, and P_F is the ratio of the price level in France in 1972 to the price level in France in 1963. With a uniform base period (1963 = 100), the index of price level in 1972 for Tunisia is 138.4 percent, and for France 146.6 percent for 1972. This procedure leads to the theoretical price of foreign currency for 1972 of 11.50 French francs for one Tunisian dinar.

But the basic structure of living style and costs may be different between different countries, and we must calculate for Tunisian migrant workers in France what Dan Usher (1966) has called the industrial gross, which is

primarily associated with the cost of transportation to and from work, and the climatic gross, which includes expenditures on clothing, electrical and durable goods, housing, and fuel and light to keep people warm. We will accordingly work also with another alternative for purchasing power by increasing the theoretical price for 1972 (1 T.D. = 11.50 F.F.) by 10 percent. Therefore, we will have for the individual decision model two theoretical exchange rates of 11.50 F.F. and 12.65 F.F. per T.D.

11.4. Cost Benefit Analysis and Labor Surplus Economies

The conceptual framework for a human capital approach to manpower studies was developed mainly with respect to full employment economies. Given full employment and factor markets which function reasonably, nominal factor prices reflect real social worth. In situations of full employment, which apply not only to full employment economies but also to occupations requiring either very high level or very specific training in economies which otherwise have surplus labor, economic benefits to society have been measured by earning differentials. The rationale for doing so is based on the basic premise of classical economic theory that earnings of different types of labor measure their respective marginal productivities, or their additions to the total national product. In symbols:

$$M P = W, \quad (4.5)$$

where W equals wages, and M P equals the marginal product.

In labor surplus economies, the market wage rate is greater than the marginal productivity of labor. We must recognize that there is a problem of socially valuing labor in economies subject to population pressure. When unemployment at all levels of qualifications is widespread, the societal decision model must take some cognizance of this state of affairs. From the point of view of maximizing national income, money wages are not likely to be a reasonable measure of social opportunity costs, and some "adjusted" wage may be needed. We use the computed rate of visible underemployment for 1972 (see Table 2.9) to adjust for the existence of unemployment, lacking shadow wages calculated from linear or dynamic models of the entire Tunisian economy.

III. The Cost-Benefit Model

In order to choose among alternatives, we would build sets of relationships which constitute models. The important function of the theoretical model is to provide a statistical framework suitable for testing. Is the investment in human capital made by migrants worth taking? The geographical mobility process is not intended to "deepen" human capital, but rather to transfer given skills to a place where they generate a higher marginal

productivity. Migration could be regarded as a form of capital. As is physical capital, it is capable of generating a long-term income stream, which represents the return on costs incurred. In the following, we shall endeavor to set up two decision models, for the individual and for society, and we shall illustrate those decision models with empirical data concerning Tunisian migrant workers to France.

III.1. The Cost-Benefit Model for the Individual Decision-Maker

An individual evaluates the opportunities available to him in all locations and chooses the place which maximizes his satisfaction. When the "best" location differs from the one in which he resides, he may move to improve his welfare. Since any increase in individual welfare may be expected to yield benefits over a considerable period of time, and since there are costs which must be incurred, it is appropriate to consider migration as an investment decision for the individual. Thus, an individual will move from one country to another only if the present value of benefits exceeds the present value of costs.

In order to estimate the effects of investment in human capital, manpower analysis frequently relies on data not only about the people involved in the study, but also for control groups or persons who are similar in all respects to those being studied. Robert S. Goldfarb (1969)

and Einar Hardin and Michael E. Borus (1971) make it clear that the designation of an appropriate control group is very difficult. Because of geographical dispersion, no attempt has been made for any follow-up of migrant workers in any country. The figures in the cost-benefit analysis would be an estimate of the average of the variables needed in the model. Benefits and costs are measured on the basis of the so-called "with-without" comparison. In other words, a situation with the proposed action (or project) is compared to a situation without it. Therefore, the cost-benefit model for the individual decision maker will involve a cost side and a benefit side.

III.1.1. The Benefit Side.--The purpose is to formulate an economic behavioral model of international migration which extends the simple wage differential approach. We consider the migration decision as a multi-period one, in which the present value of the costs of migration should, at the margin, be equal to the present value of the benefits from migration. We assume that a given migrant worker would expect his decision to leave his home country to yield a real earnings stream Y_1, Y_2, \dots, Y_n .

The present value of this income stream is

$$V = \sum_{t=0}^n \frac{Y_t}{(1+i)^t}, \quad (4.6)$$

where i is the market discount rate, and it is assumed to be the same for each period. If we let X the alternative of staying in the home country with income stream X_1, X_2, \dots, X_n , then the benefits from choosing Y (leaving the country) for the individual migrant is:

$$B_{I_{i,j}} = \sum_{t=0}^n \frac{Y_t - X_t}{(1+i)^t}. \quad (4.7)$$

- Y_t will represent the average real yearly earnings in the area of destination for the i^{th} occupational category ($i = 1, 2, 3, 4$) and for the j^{th} economic sector ($j = 1, 2, \dots, 12$); while X_t will represent the corresponding average real yearly earnings in the area of origin, Tunisia.

This formulation will be made for four occupational categories (unskilled, semi-skilled, skilled workers, and technicians) and for twelve economic sectors (mining and quarrying; food, beverage, and tobacco; construction materials; ceramics and glass; mechanical and electrical industries; wood and furnishing; paper and other industries; construction; transportation; commerce; and other services).

In addition to the assumptions incorporated in this formulation, we assume that (1) the planning horizon for each worker is identical and independent of others'; (2) the discount rate is constant over the planning horizon and is identical for all migrant workers; (3) a migrant worker with a specified qualification would be paid

a salary corresponding to his French colleague; and (4) there would have been no change in the migrant's employment status or earnings if he had remained in his own country.

At this stage, a number of adjustments must be made to the data on benefits in order to calculate the benefit-cost ratios relevant to our analysis.

Secular growth of Income: r

In dealing with future earnings, we must adjust for the secular growth of income. Income may grow over time due to the accumulation of capital and technical progress. Arnold C. Harberger (1974) states that

In any economy experiencing successful economic development, it can be anticipated that real wage will rise at a rate of two percent a year or more.

Accordingly, we have adjusted equation (4.7) to include a long-term rate of growth of average real wages: r_D in the area of destination and r_0 in the area of origin. Therefore, we have a new equation:

$$B_{I,i,j} = \sum_{t=0}^n \frac{(1+r_D)^t Y_t - (1+r_0)^t X_t}{(1+i)^t}. \quad (4.8)$$

On the basis of the growth of average real yearly earnings in France from 1963 to 1972, this growth rate of wages is assumed to be 3.5 percent for France.² From the

²Annuaire Statistique de la France, 1963 to 1972.

growth rate of average industrial real wages in Tunisia for the period 1961-1971, we find out that r_0 , the growth factor in the area of origin, is about 2 percent.³ Since there is widespread unemployment in Tunisia, the rising real wages need an explanation. Economists studying wages in underdeveloped countries have been unable to explain their findings of rising real wages in modern industry except by recourse to a "political" explanation. Increases in real wages are said to be the result not of market forces, but of economically irrational factors such as strong unions and government policies to gain working class support. There is also an alternative theory in the literature of economic development put forward by Walter Galenson and Harvey Leibenstein (1955) and by John C.H. Fei and Alpha C. Chiang (1966): Within a certain range, higher wages result in higher labor productivity. Therefore, it may be profitable for employers to pay the higher wages.

Adjustment for taxes: T.

Since individuals exclude taxes when evaluating their earnings, the benefits used in determining benefit-cost ratios must also be corrected for taxes. The amount of the tax depends on the worker's total family income and the number of exemptions he claims for dependents. From information on tax rates in Tunisia and France, by range of income family status, we take the average of tax rates.

³See Appendix 2.C.

Thus, the average tax rate in the area of destination, T_D , would be approximately 12 percent,⁴ while the average tax rate in the area of origin, T_0 , would be about 18 percent.⁵ The individual benefits, therefore, would be

$$B_{I_{i,j}} = \sum_{t=0}^n \frac{(1-T_D)(1+r_D)^t y_t - (1-T_0)(1+r_0)^t x_t}{(1+i)^t}. \quad (4.9)$$

If economic knowledge was ideal, the adjustment for taxes would also require an adjustment for the share of public goods. Public goods are defined as those from which the benefits are such that A's partaking thereof does not interfere with the benefits derived by B. Public goods give satisfaction to all people in the society as soon as they are produced. They differ from private goods, whose benefits are enjoyed by either A or B. At some independently determined tax rates some taxpayers are getting more than they are willing to pay for. Unfortunately, we are unable to adjust earnings for the option of being able to use public goods.

Adjustment for unemployment: E

The labor supply to receiving countries is a function not only of the prevailing income differential, but

⁴Guide Pratique du Contribuable, Paris 1972.

⁵Ministere du Plan. Structure des qualifications et des salaires, op. cit.

also of the certainty or uncertainty concerning its receipts. Migration is a costly job, and the uncertainty of finding a suitable job will affect the decision. Migrant workers must balance the probability and risks of being unemployed or underemployed for a certain period of time in the country of origin against the favorable expected wage differentials. Since the level of unemployment among Tunisian migrant workers is not negligible, it is necessary to correct the adjusted figures of present value of disposable income for the percentage of unemployment in the labor force. This adjustment is considered necessary because the probability of unemployment is frequently cited as a cause of out-migration. The model in equation (4.9) has been modified from one of individual decisions, based on individual opportunities, to a probability model based on average opportunities. This modification is, of course, necessary considering the aggregate nature of the available data on migration. This adjustment presupposes that people act like the rational man of the textbooks on probability theory by manifesting behavior approximating the calculated mathematical expectations of their earnings.

The available estimates of unemployment differ widely, and it is difficult to decide which should be accepted for our purpose. The rates of unemployment are also different in different regions. Ideally, we need to

know the rate of unemployment among potential migrant workers. Lacking such data, we will work with three hypotheses concerning the probability of employment at the area of origin, E_0 :

1. $E_0 = 0$, that is, the migrant was unemployed;
2. $E_0 = 1$, that is, the migrant was employed before his departure to another country; and
3. $E_0 = .63$, that is, the migrant was underemployed before his departure. This rate of underemployment was computed in Chapter II for 1972.

But we will assume the probability of employment at the area of destination, E_D , is equal to one, at least until the end of 1973, before the oil crisis.

At this stage, the new adjusted equation is:

$$B_{I,i,j} = \sum_{t=0}^n \frac{E_D(1-T_D)(1+r_D)^t Y_t - E_0(1-T_0)(1+r_0)^t X_t}{(1+i)^t}. \quad (4.10)$$

Adjustment for Differential Ability: α

The earnings differentials which we noted to be associated with geographical mobility cannot be solely attributed to differential investments in mobility. The returns to investment in mobility are crucially influenced by other factors. In order to isolate the effect of

migration, we must use benefit figures adjusted for factors which are exogenous to migration. Native ability, achievement drive, endowed intelligence, ambition, and home background are some of the important factors which have an independent effect on earnings.

However, given the total absence of data concerning the relative significance of these characteristics, will assign an a priori value for α . In the United States where the relevant data exist, there is some consensus that about two-thirds of earnings differentials associated with difference years of schooling can be statistically attributed to schooling alone. The value of α was chosen arbitrarily by Edward F. Denison (1962) in the Sources of Economic Growth in the U.S. Michael E. Borus (1964) suggests that the increase in wages directly due to retraining should be reduced by about 50 percent. Gary S. Becker (1964) estimates the contribution of these noneducational factors to earnings differentials to be about 12 percent. For LDCs, there is no evidence that would throw light on education as opposed to the other determinants of income.

Therefore, we have made our calculation on the assumption that 20 percent of the earnings differentials arise from nonmigration factors. This figure seems reasonable because migrant workers have in general a higher need for achievement than the average population. This pay-off does not arise in a single or several years, but it continues on an average throughout one's working lifetime.

Equation (4.10) becomes

$$B_{Ii,j} =$$

$$\alpha \sum_{t=0}^n \frac{E_D(1-T_D)(1+r_D)^t Y_t - E_D(1-t_0)(1+r_0)^t X_t}{(1+i)^t}, \quad (4.11)$$

where α represents differential ability.

Before moving to the analysis of the cost side, we should note three qualifications. First, no adjustment is made for the "unearned" income that would accrue to the migrants as a return on their savings and investments while abroad. Second, no additional adjustment is made to reflect the incidence of mortality. Third, there is a built in oversimplification in assessing the economic efficiency of migration by reference only to its effect on income earning. Migration does more than merely raise income. References to the income-generating effects of migration imply a view of migration as an investment from which high monetary returns are expected to flow. It is also a consumer good, something which people buy because they like it, not just because it will help raise their incomes; consumption benefits from migration. Including such benefits as possibly increasing enjoyment of life are particularly difficult to measure, but their relevance should not be dismissed.

III.1.2. The Cost Side,--Costs are of two types: pecuniary and nonpecuniary.

Direct pecuniary costs are due to three factors. The first is travel expenditures necessitated by migration. They are estimated, for a one-way trip, to be 500 F.F. Local transportation costs are of relatively minor importance. Even in the unlikely event that 20 to 30 percent more is needed to cover local transportation in the originating and receiving areas, the overall situation is not affected significantly. Second, administrative costs for passports, medical examinations, and so forth, are estimated at 80 F.F. Third, there are costs for additional living expenses in the area of destination in the form of clothing and other amenities. Since the yearly tourist allowance for any Tunisian going abroad is 555 F.F., we use this figure as an approximation of these costs.

There is one major indirect pecuniary cost: Earnings are foregone while searching for a new job. However, unemployment and underemployment are widespread in Tunisia, and these costs may not be great to the extent that such search is concentrated among those already unemployed. Also, recruitment procedures postulate that potential migrant workers should be unemployed for three months at least. These costs may actually be nil for Tunisian migrant workers, but the out of work status facilitates migration procedures.

The major nonpecuniary costs are those which can be defined as the net disutility expected by the migrants. Although these are not out-of-pocket costs, they impose a sacrifice when the migrant leaves home (home ownership, family life, friends, recreational activities). No attempt is made here to identify these costs.

It appears that there is a lack of symmetry between costs and returns. The gains could be identified mainly in monetary terms, while the significant costs for the individual may be essentially noneconomic. However, there are intangible benefits associated with a career advance, especially a movement from a position of unemployment to employment.

In addition to these costs, it appears that Tunisian migrant workers in France visit Tunisia every other year. These costs may be a proxy for the psychic costs of migration. There is an obvious difficulty in measuring these psychic costs. Aba Schwartz (1973) suggests an alternative to direct measurement:

Psychic costs can be transformed into permanent transportation cost by figuring the needed frequency of visits to the place of origin as to negate the agony of departure from family and friends.

He goes on to argue that this frequency is likely to increase with age. Thus, psychic costs are likely to rise with age, and hence the deterring effects of distance should also rise with age. Our estimate for these costs of visiting is about 2,000 F.F. every other year.

Therefore, the cost equation is

$$C_I = C_T + C_A + C_{AD} + \sum_{t=0}^n \frac{C_V}{(1+i)^t}, \quad (4.11)$$

where:

C_I = the present value of the total costs for the individual;

C_T = the cost of transportation;

C_A = the administrative cost;

C_{AD} = the initial adjustment costs or costs for clothing, and so forth, in the area of destination; and

C_V = the cost of visiting every other year.

III.2. The Cost-Benefit Model for the Society

The decision to migrate is a matter of individual choice, but emigration could also affect the nonmigrants in a society. The social economic gain from migration could differ from the private gain because of differences between social and private costs and returns. Economists have generally had little success in estimating the social effects of different investments. Unfortunately, migration is no exception. Direct costs are clearly greater to society than to migrant workers because some of the expenditures on migrant workers are paid out of public subsidies.

Indirect costs, on the other hand, would be greater to society only if the output of migrant workers foregone by society exceeded the returns. The development of a more sophisticated estimate of the social gain is not easy, because other external effects are very difficult to measure. It is, therefore, the purpose of this section to set up a model of cost-benefit analysis for the society as a whole and to identify those costs that would result from such a course of action.

III.2.1. The Benefit Side.--By social benefits we mean the net output made available to the economy that would not have been available in the absence of such a course of action. If this net output adds to the supply of the economy, it may appropriately be regarded as the social benefit for the purposes of our analysis. However, if the net output does not add to the supply available in the economy, but instead substitutes for an alternative source of supply, leaving the total supply constant, then the net output to the society is really reflected by the resources released from the alternative source of supply. These benefits to the society from emigration would comprise the gains in output which might be specifically attributed to the outflow and the saving on current government expenditures. The identification of these benefits involves three presuppositions: (1) we seek to maximize economic welfare however this may be defined.

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Per capita income is the only measure of welfare that is being maximized; (2) this welfare refers only to the people living today and does not take into account the welfare of the unborn; and (3) this welfare refers to the welfare of the residents of the country, viewed as a totality, and excludes from consideration the welfare of people born in Tunisia who choose to leave it, as well as the welfare of the outside world in general.

A. Benefits and Increase in the National Income

Since some of these benefits constitute the increase in national income attributed to the emigration, the only increase in national income resulting from migration is the remittances sent home by the emigrants.

We suppose that remittances increase directly with the net disposable emigrant monthly wage. The amount also depends on the length of stay of the migrant in the receiving country. It is not certain which way this factor will work, but it is hypothesized that the longer the worker stays in the receiving country, the less inclined he is to send home some part of his earnings. Moreover, we suppose that this decay factor is uniform for people living abroad and that, it being a function of the time the emigrant spent away from the country, it will operate after five years of being abroad at a 10 percent yearly rate.

The remittance behavioral equation is, therefore,

$$r = h (W_D, L, a), \quad (4.12)$$

where:

r = the monthly remittance sent home;

W_D = the monthly disposable income;

L = the length of stay in the receiving country; and

a = the marital status of the migrant worker.

Information about saving and family maintenance expenditure taken separately is only available from surveys. There is no general rule governing the amount of these remittances. Each migrant worker represents an individual case. Tunisian data indicate that married migrants will send home about one-third of their disposable income, while bachelors will send, on the average, 15 percent of their disposable income.⁶ We, therefore, proceed with two cases: one for married emigrants and one for bachelors.

Case I: Married Emigrants

The benefits accruing to society, $B_{S,i,j}$, from the increase in national income due to the departure of a worker from the i^{th} occupational category ($i = 1, 2, 3, 4$) and the j^{th} economic sector ($j = 1, 2, \dots, 12$) would be equal to:

⁶Tijani BEN SASSI, op. cit.; and STB Rapport de Mission, Dec. 1972.

$$B_{S,i,j,M} = \sum_{t=0}^n \frac{A \cdot B_M (1-T_D) (1+r_D)^t Y_t}{(1+i)^t}, \quad (4.12)$$

where $B_{Si,j,M}$ is the present value of the benefits over the corresponding range of action (two, five, or ten years) for the i^{th} category and the j^{th} economic sector; T_D is the average income tax in the area of destination (12 percent); r_D is the rate of growth of wages in the area of destination (3.5 percent); Y_t is the yearly wage received by each migrant in the country of immigration for four occupational categories and for 12 economic sectors; i is the social discount rate, at 5, 10, and 20 percent; B_M is the average propensity of sending remittances out of the disposable income for the varried migrant workers, assumed to be about 33 percent; and A is the decay factor. A priori, remittances are expected to vary directly with wages and indirectly with the time migrants are away from home. It is hypothesized that the longer the worker stays in the receiving country, the less inclined he is to remit his earnings, and that the factor will not operate for the first five years. Thereafter, it has the values shown in Table 4.2.

Case II: Bachelor Emigrants

For the case of bachelor emigrants, as compared to married workers, the only difference in the average propensity of sending remittances out of disposable income

TABLE 4.2.--Values of the Decay Factor.

| Years Abroad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------|---|---|---|---|---|----|----|----|----|----|
| Values of A | 1 | 1 | 1 | 1 | 1 | .9 | .8 | .7 | .6 | .5 |

is set at 15 percent rather than 33 percent. Therefore, (4.11) is:

$$B_{Si,j,B} = \sum_{t=0}^n \frac{A \cdot B_B (1-T_D) (1+r_D)^t Y_t}{(1+i)^t}, \quad (4.13)$$

where B_B is the average propensity of sending remittances out of the disposable income for the bachelor emigrants, and all other variables stand as defined for the married case.

Before we move to the benefit accruing to society as a result of the saving on some current expenditure, we should mention that we did not include any multiplier effect, although the consumption of these remittances in the home country by the members of the migrant workers' families might create real income for the rest of the economy.

B. Benefits and Savings on Expenditures

By benefits and savings on expenditures is meant the goods and services withdrawn from the rest of the economy that would not have been withdrawn in the absence of the emigration process. Two types of benefits have been identified as saving on some government expenditures.

The first is the per capita subsidy to all the people living in the country for the basic necessities (sugar, bread, soy bean oil, and so forth) to maintain their prices. On the basis of total subsidies of about

4.345 million T.D. for a total population in 1972 of 5.310 million persons,⁷ this amounts to be about .820 T.D. per capita. The social benefits as they appear in equations (4.12) and (4.13) for the two cases of married migrants and bachelor migrants have to be increased by this saving, S_G , achieved on some current expenditure due to the departure of migrant workers to foreign countries.

$$B_S = \sum_{t=0}^n \frac{S_G}{(1+i)^t}, \quad (4.14)$$

Where B_S is the present value of these benefits and i is the social discount rate.

The second type of benefit is the decrease in transfer payments (TP) owing to the departure of one unemployed person who has been receiving some welfare payments from the public works program. For the case of the unskilled migrant workers, in addition to equations (4.12) or (4.13), we must add the present value of the transfer payments saved, $B_{S.T.P.}$.

$$B_{S.T.P.} = \sum_{t=0}^n \frac{T.P.}{(1+i)^t}, \quad (4.15)$$

⁷The Fourth Development Plan (1973-1976), op. cit.

Since 9,000 million T.D. were spent in 1969 on these public works programs and since 93,000 persons were working, the annual per capita transfer payment saved is about 96.770 T.D.

III.2.2. The Cost Side.--The concept of social cost is amenable to various interpretations, and it is useful to begin with a clear understanding of what costs stand for in the context of social benefit-cost analysis. The social costs can be identified as the effects of reduction in national income from what it would have been in the absence of emigration. The social costs of migration must be calculated on a marginal, or "with" or "without," basis. Only those additional costs which would not have arisen in the absence of the program are considered. With respect to the cost side, we have identified two cases; the first one does not take into account all the social expenditures on education while the second does.

Case I: Exclusion of Educational Investment

In excluding educational investment we must first account for the administrative costs incurred by the OTTEFP when potential migrants submit their cases. The local offices of the OTTEFP perform a number of functions specifically for migration, including screening the files for possible migrants, calling the selected workers in for counseling, aptitude testing, and all the

record-keeping involved in performing these functions. These costs are about 17 T.D. per migrant worker and are denoted by C_G .

Social cost also includes the social loss accruing from migration. This loss is equal to the total surplus made by each individual. While some economic models portray wage earners as spending all of their income in a given period on consumption goods, we proceed here on the assumption that their savings is not zero. We consider any social loss the surplus accruing from any production in excess of the consumption level for each migrant worker. The rationale of such a criterion is the maximization of output, not just in some specific fields in which investments are made, but for the economy as a whole. This method approaches the problem in terms of the propensity of the potential migrant to save, and it is exactly opposite to Stephen Enke's method. Enke's essential idea is that in a country where population pressure on resources is intense, the marginal productivity of people during their lives is less than their consumption.⁸ But if we believe that the marginal productivity of labor is zero, the value of a new birth is obviously negative and consists of nothing but discounted consumption costs. We reject this method and

⁸Stephen Enke, "The Gains to India from Population Control: Some Money Measures and Incentive Schemes," Review of Economic and Statistics 42, No. 2 (May 1960), 175-181.

include in the analysis the belief that some productive surplus will be redeemed. This saving is the net loss to the economy and to the society from the average productivity of the potential migrant, if he had stayed home, in excess of his own consumption.

Therefore, the present value of social cost, $C_{S,i,j}$, for the i^{th} category and the j^{th} economic sector is

$$C_{S,i,j} = C_{Gr} \sum_{t=0}^n \frac{S(1-T_0)(1+r_0)^t E_0 X_t}{(1+i)^t}, \quad (4.16)$$

where:

T_0 = the average income tax in the area of origin
(17 percent);

r_0 = the rate of growth of wages in the area of
origin (2 percent);

E_0 = the national average rate of unemployment in
Tunisia;

i = the social discount rate;

X_t = the yearly wage received by each migrant
in Tunisia for the four occupational
categories and for 12 economic sectors; and

S = the marginal propensity to save out of
disposable income.

Concerning the savings factor, estimates of the short-run consumption function are often derived from budget studies of consumer behavior based on

cross-sectional data. It is well known that such estimates of the short-run consumption function differ from life cycle consumption patterns on time-series analysis. For our purpose of estimating the long-run proportion of income saved, what we need is the latter. A coefficient of 7.7 percent was found when consumption was regressed upon private disposable income in Tunisia.⁹

Case II: Inclusion of Educational Investment

A migrant does not suffer in terms of income if he leaves the country in which he was educated for a higher paying job abroad. The individual's benefits from his educational investment tend to be realized by the individual, wherever he may be located. But part of the investment probably was made by others, such as government or business. The tax system is, of course, a principal means by which public authorities seek to finance this investment. If the subsidized portion of education received by an individual exceeds his (or his family's) tax contributions, there is a "debt to society." If, however, emigrating individuals have really been paying more taxes than benefits received from subsidized public services, there is clearly a net loss to society. There are two major issues here: The first concerns the redistribution of personal

⁹The Fourth Economic Development Plan (1973-1976), op. cit., p. 100.

income by governmental taxation and expenditure policies. It is assumed that the emigrant is typically in a higher income tax bracket than the average of the population. In this case, emigration deprives those who remain behind of their tax-mediated share in the emigrant's income. The second concerns intergenerational transfers of income through the governmental budget. To the extent that the currently working generation pays the costs of education of the young through its taxes, and in return expects to be supported in its old age by pensions financed by taxes on the incomes of the presently young after they have moved into the currently working category, emigration of the young after completion of education imposes a redistributive burden on society if the expectation of the elders of expected retirement benefits is to be met.

We feel that migration constitutes a safety-valve rather than a net loss. For various reasons, it seems that the educational system produces a supply larger than the economic system can absorb. Apart from any deterioration in the newly acquired skills of the potential migrant workers due to idleness, public authorities are subject, and yield, to pressure to find employment for them, which results in expenditures which are better incurred elsewhere. Although, when more developed, the country will need and be able to employ a much larger number of educated people than under present circumstances, additional

educated people do not necessarily contribute significantly to the development process. For our social model, we will therefore consider a case which takes into account the social cost of vocational education because this output, as reported by Alya Chouikha-Baffoun (1971), provides the major element for emigration. To equation (4.16), we thus add the social costs of education, C_{ED} , per migrant worker for three occupational categories: semi-skilled and skilled workers, and technicians.¹⁰ Unskilled labor is defined as only the most primary kind, that which can be supplied by a man without any special education or general training.

Human investment decision models provide useful conceptual and empirical tools when applied to migration. In this chapter we have developed models of labor mobility. They began with the individual viewpoint and then were transformed into more complex decision models, as individually expected earnings were replaced by socially expected or realized productive contributions. Virtually all the implications are based on the effect on investment in migration on earnings and productivity. Consequently, the significance of that analysis can be determined most directly through an empirical examination of the relation between earnings or productivity and human capital. This

¹⁰See Appendix 2.B.

will be done in the next chapter for a number of time periods, levels of qualification, discount rates, unemployment rates, and economic sectors.

CHAPTER V

NUMERICAL RESULTS AND OTHER EFFECTS OF MIGRATION ON ECONOMIC VARIABLES

We are now able to combine the information on benefits and costs of migration to calculate the benefit-cost ratios for the two decision makers, the individual and the society, and for different alternatives and levels of qualification. Rather than simply listing the data inputs (which is done in the appendix to this chapter and in Tables A5.1 to A5.40), we will attempt to research the information in a more systematic and analytical way in Section I. Section II will move from the estimate of benefit-cost ratios to a discussion of the effect of international migration on economic variables in the labor exporting country. Finally, in Section III, some elements about the future of the emigration system and the question of returning migrants will be discussed.

I. Numerical Results

The results of the different hypotheses for each model of cost-benefit analysis (the individual and the

society) will be presented separately and then some general findings related to the two models will be offered.

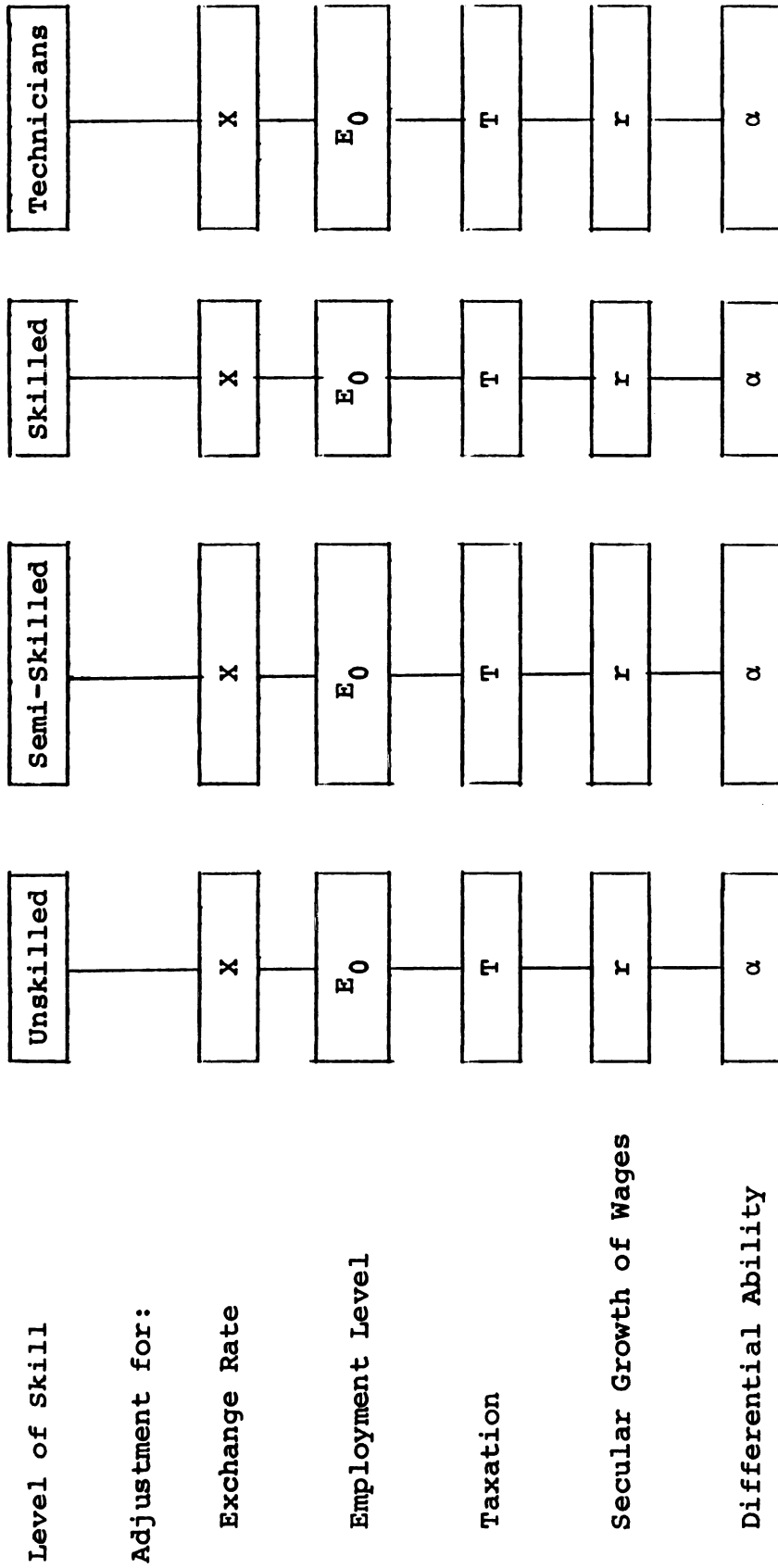
I.1. Results for the Individual Cost-Benefit Analysis

The findings for the different benefit-cost ratios (BCR) under the hypotheses worked out in the model presented in Chapter IV (see Figure 5.1) support the decision made by individuals with respect to migration. In all cases, the BCRs show a figure greater than 2.41.

As we proceed, with respect to the individual's decision, from a situation of employment in the area of origin equal to 1 ($E_0 = 1$) to a situation of total unemployment in the area of origin ($E_0 = 0$), the BCRs increase for all the four occupational categories in all the 12 economic sectors covered by the analysis. The increase averages 20-59 percent for unskilled workers, 31 to 38 percent for the semi-skilled, 39 to 41 percent for skilled workers, and 57 to 58 percent for technicians. Therefore, we can say that the lower the probability of employment in Tunisia, the greater the inducement to migrate (Tables 5.1, 5.2, 5.3 and 5.4).

Although these results are suggestive of large potential pay-offs from emigration, several points should be noted.

First, individuals are not likely to make precise calculations of benefits and costs. Nevertheless, underlying the decision to migrate is a basic expectation of a



Discount Rates: 4, 6, 12%

Figure 5.1.--Variants of Private Benefits Developed in the Private Cost-Benefit Model.

TABLE 5.1.--Averages and Standard Deviations of Private Benefit-Cost Ratios for the Unskilled Workers.

| E_0 | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|-------------|---|---------------|---------------|---|---------------|---------------|--|---------------|---------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| X = 11.50 | | | | | | | | | |
| $E_0 = 0$ | 5.18 (.25) | 8.28 (.40) | 8.55 (.41) | 5.14 (.25) | 8.15 (.39) | 8.45 (.41) | 5.05 (.25) | 7.79 (.38) | 7.08 (.34) |
| $E_0 = .63$ | 4.15 (.21) | 6.68 (.34) | 6.95 (.35) | 4.13 (.27) | 6.57 (.33) | 6.87 (.34) | 4.05 (.21) | 6.28 (.32) | 5.74 (.29) |
| $E_0 = 1$ | 3.55 (.23) | 5.74 (.37) | 6.01 (.38) | 3.53 (.23) | 5.65 (.36) | 5.94 (.37) | 3.46 (.22) | 5.39 (.34) | 4.96 (.31) |
| X = 12.65 | | | | | | | | | |
| $E_0 = 0$ | 4.98 (.24) | 8.07 (.39) | 8.48 (.40) | 4.88 (.31) | 7.94 (.38) | 8.33 (.40) | 4.46 (.21) | 7.56 (.36) | 8.00 (.39) |
| $E_0 = .63$ | 3.91 (.21) | 6.36 (.33) | 6.70 (.35) | 3.87 (.20) | 6.21 (.29) | 6.61 (.34) | 3.48 (.18) | 5.95 (.31) | 6.34 (.33) |
| $E_0 = 1$ | 3.26 (.23) | 5.35 (.37) | 5.68 (.38) | 3.23 (.23) | 5.25 (.36) | 5.61 (.38) | 2.92 (.21) | 5.20 (.35) | 5.37 (.31) |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE 5.2.---Averages and Standard Deviations of Private Benefit-Cost Ratios for Semi-Skilled Workers.

| E_0 | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|-------------|---|---------------|----------------|---|---------------|----------------|--|---------------|---------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| $X = 11.50$ | | | | | | | | | |
| $E_0 = 0$ | 6.21 (.35) | 9.93 (.56) | 10.24 (.57) | 6.17 (.34) | 9.77 (.55) | 10.12 (.57) | 6.05 (.34) | 9.34 (.52) | 9.48 (.48) |
| $E_0 = .63$ | 4.91 (.40) | 7.90 (.64) | 8.23 (.65) | 4.88 (.39) | 7.77 (.63) | 8.13 (.64) | 4.79 (.39) | 7.43 (.60) | 7.79 (.54) |
| $E_0 = 1$ | 4.15 (.47) | 6.70 (.72) | 7.04 (.76) | 4.05 (.55) | 6.60 (.74) | 6.95 (.76) | 4.0 (.47) | 6.30 (.71) | 5.80 (.63) |
| $X = 12.65$ | | | | | | | | | |
| $E_0 = 0$ | 5.92 (.42) | 9.67 (.54) | 10.10 (.57) | 5.92 (.33) | 9.51 (.53) | 9.89 (.42) | 5.28 (.31) | 9.06 (.51) | 5.59 (.54) |
| $E_0 = .63$ | 4.60 (.39) | 7.50 (.64) | 7.91 (.66) | 4.56 (.39) | 7.37 (.63) | 7.81 (.65) | 3.85 (.41) | 6.99 (.61) | 7.45 (.71) |
| $E_0 = 1$ | 3.79 (.48) | 6.18 (.67) | 6.63 (.79) | 3.37 (.49) | 6.12 (.66) | 6.54 (.78) | 3.40 (.43) | 5.82 (.72) | 6.26 (.75) |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE 5.3.--Averages and Standard Deviations of Private Benefit-Cost Ratios for the Skilled Workers.

| E_0 | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|-------------|---|----------------|----------------|---|----------------|----------------|--|----------------|----------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| $X = 11.50$ | | | | | | | | | |
| $E_0 = 0$ | 7.14 (.50) | 11.42 (.81) | 11.78 (.83) | 7.09 (.50) | 11.24 (.79) | 11.56 (.83) | 6.96 (.49) | 10.74 (.76) | 9.76 (.69) |
| $E_0 = .63$ | 5.21 (.76) | 8.39 (1.21) | 8.75 (1.22) | 5.17 (.76) | 8.01 (1.53) | 8.66 (1.21) | 5.07 (.75) | 7.89 (1.14) | 7.24 (1.02) |
| $E_0 = 1$ | 4.07 (1.02) | 6.61 (1.61) | 7.00 (1.61) | 4.04 (1.01) | 6.42 (1.59) | 6.91 (1.61) | 3.96 (.99) | 6.21 (1.21) | 5.75 (1.35) |
| $X = 12.65$ | | | | | | | | | |
| $E_0 = 0$ | 6.86 (.48) | 11.13 (.79) | 11.63 (.82) | 6.81 (.48) | 10.94 (.77) | 11.48 (.81) | 6.15 (.43) | 10.42 (.73) | 11.03 (.78) |
| $E_0 = .63$ | 4.82 (.77) | 7.88 (1.24) | 8.35 (1.27) | 4.79 (.77) | 7.75 (1.22) | 8.24 (1.25) | 4.31 (.69) | 7.37 (1.16) | 7.90 (1.21) |
| $E_0 = .63$ | 3.62 (1.05) | 5.96 (1.67) | 6.43 (1.71) | 3.59 (1.04) | 5.86 (1.65) | 6.34 (1.69) | 3.24 (.94) | 5.58 (1.57) | 6.10 (1.70) |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE 5.4.--Averages and Standard Deviations of Private Benefit-Cost Ratios for Technicians.

| E_0 | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|-------------|---|-----------------|-----------------|---|-----------------|-----------------|--|-----------------|-----------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| $X = 11.50$ | | | | | | | | | |
| $E_0 = 0$ | 8.37 (.66) | 13.77 (1.34) | 13.95 (1.21) | 8.15 (.93) | 13.31 (1.16) | 13.79 (1.20) | 8.24 (.72) | 12.71 (1.11) | 11.55 (1.00) |
| $E_0 = .63$ | 5.23 (.94) | 8.46 (1.47) | 8.90 (1.50) | 8.90 (1.95) | 8.32 (1.45) | 8.80 (1.48) | 5.08 (1.48) | 7.94 (1.38) | 7.33 (1.24) |
| $E_0 = 1$ | 3.32 (1.21) | 5.48 (1.91) | 5.94 (1.92) | 3.29 (1.21) | 5.39 (1.88) | 5.86 (1.92) | 3.22 (1.20) | 5.14 (1.80) | 4.84 (1.65) |
| $X = 12.65$ | | | | | | | | | |
| $E_0 = 0$ | 8.13 (.71) | 13.17 (1.14) | 13.76 (1.19) | 8.06 (.70) | 12.95 (1.13) | 13.59 (1.18) | 7.28 (.63) | 12.13 (1.07) | 13.05 (1.14) |
| $E_0 = .63$ | 4.70 (.93) | 7.75 (1.50) | 8.29 (1.54) | 4.67 (.93) | 7.60 (1.49) | 8.17 (1.52) | 4.21 (.84) | 7.24 (1.40) | 7.67 (1.55) |
| $E_0 = 1$ | 2.73 (1.27) | 4.59 (1.94) | 5.09 (2.03) | 2.67 (1.24) | 4.48 (1.96) | 5.18 (2.08) | 2.41 (1.21) | 4.25 (1.87) | 4.74 (1.93) |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

net gain to the person himself and to his family. This does not preclude the possibility, of course, of a divergence between expected and actual benefits and perhaps even a subsequent decision to return.

Second, some migrants do not secure a fixed contract, but venture on their own as tourists. For these migrants costs are greater and BCRs are lower.

Third, concerning wages in the country of destination, we have worked out the numerical evaluation as if migrant workers will be paid the same wages as the native of the country of destination for each occupational category and for each sector. But migrant workers may suffer from a wage lower than that of the nationals. This will have the effect of lowering the present value of the benefits per migrant worker and, therefore, the BCRs.

Fourth, the calculations have been computed on the assumption of a 2 percent annual increase in real wages in Tunisia and a 3.5 percent increase in France. But if the gap between earnings narrows, the decision to migrate might be altered. We calculate some other annual rates of increase in real wages in the country of origin that will lead to a nil wage differential. These rates are between 15.2 and 4.3 percent for a time horizon of ten years and for an exchange rate, equal to 11.50. These rates are very high for the unskilled, semi-skilled, and skilled workers, but lower for technicians. For this latter

category, if any shortage is felt, wages may increase at an annual rate of 4.3 to 5.5 percent in order to encourage technicians to stay. These figures are an indication of how much earnings in the country of origin (Tunisia) would have to rise for people to stop migration.

Fifth, BCRs have been worked out on the assumption of an average work-week of 45 hours. Some migrant workers, to achieve an "artificial" parity, will work more, and this again will increase the BCRs presented here.

Sixth, the BCRs are not affected to a great extent by the length of the period of stay in the country of destination. As the migrant workers stay longer, the BCRs increase for the four occupational categories, the twelve economic sectors, the three discount rates, the two rates of exchange, and the three probability of employment in the area of origin variables. The increase is 32 to 43 percent for a period of stay of two and five years, respectively. Although it is a matter of indifference between the decision to stay five or ten years, a difference of 3 to 6 percent in the BCRs is noticed.

Seventh, in the two rates of exchange used ($X = 11.50$ and $X = 12.65$) to reflect what D. Usher (1966) called the climatic and the industrial gross, there is a change of 2 to 6 percent in the BCRs.

Eighth, throughout all analysis we have assumed a probability of employment in the area of destination

equal to one ($E_D = 1$). Although this figure is not supported by the information available, it does reflect a very close approximation of reality. Still, in 1973 and after the oil crisis, there were in France 1.93 million foreign workers, and only 120,000 were unemployed. This yields a rate of unemployment of 6.6 percent.¹

Ninth, the discount rates used for the individual decision maker, 4, 6, and 12 percent, do not seem to affect in any way the decision to migrate.

Finally, some individuals would expect other gains, including experience, knowledge of a new language, and the insights into the ways of others. There is in fact a consumption side to the investment side which is very difficult to evaluate.

I.2. Results of the Society Cost-Benefit Analysis

Cost-benefit analysis serves economic policy makers only as an aid or preparation in reaching decisions. It cannot displace the responsibility for making the decision, which must finally be politically determined. But to inform those with responsibility of the effects of their decision on social welfare, a numerically supported analysis is necessary.

¹The Economist, August 9, 1975.

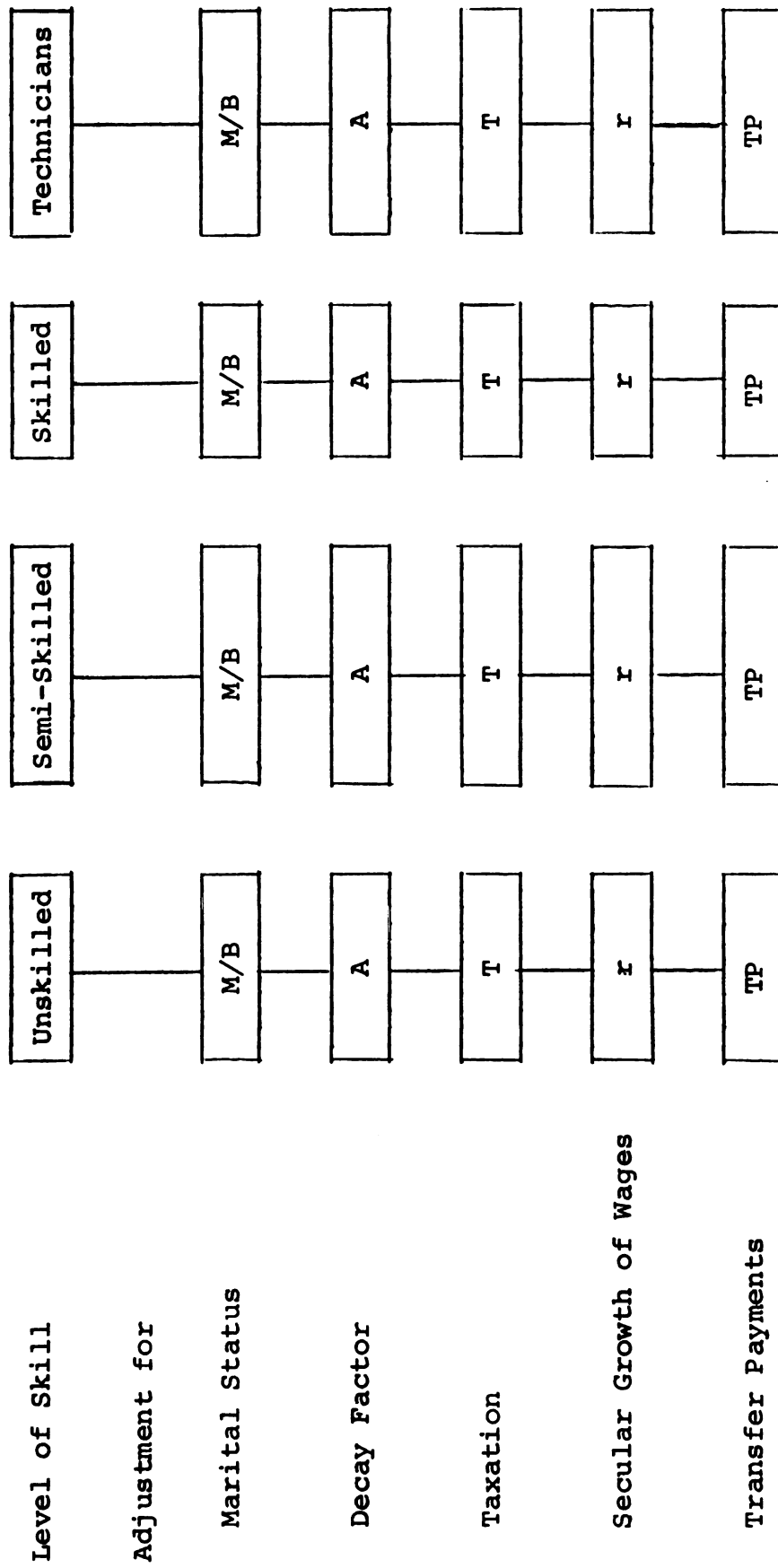
Two cases will be distinguished (see Figure 5.2): social cost-benefit analysis which does not take into account any form of transfer payments; and social cost-benefit analysis which takes into account the transfer payments given to unskilled workers and the educational costs embodied as investment in human capital in each migrant who is a semi-skilled or skilled worker, or technician.

I.2.1. Transfer Payments Not Included.--When the educational costs embodied as human capital are not taken into account, the BCRs are greater than 4.83 in all cases for the married or bachelor migrant workers (Table 5.5, 5.6, 5.7, and 5.8). We may also note several points.

(1) The BCRs for married migrant workers, because of the behavioral assumption made with respect to the amount sent home (married migrants will send 33 percent while bachelors will send only 15 percent of disposable income), are greater by 42 to 46 percent in all the cases.

(2) It appears from Tables 5.5, 5.6, 5.7, and 5.8 that the period of stay abroad has very little effect on the values of the BCRs. There is a slight increase of 2 to 4 percent between a stay of two and five years but there is a more substantial decrease of 6 to 13 percent in the BCRs between a stay of five and ten years.

(3) As the social discount rate increases from 5 to 20 percent, we notice a slight increase of one to 3 percent in the different values of the BCRs for all cases.



Discount Rates: 5, 10, 20%

Figure 5.2.--Variants of Social Benefits Developed in the Social Cost-Benefit Model.

TABLE 5.5.--Averages and Standard Deviations of Social Benefit-Cost Ratios for Unskilled Workers.

| Family Status | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------|--|------------------|------------------|---|------------------|------------------|---|------------------|------------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Transfer Payments Not Included | | | | | | | | | |
| Married | 22.07 (3.06) | 22.55 (3.13) | 19.62 (2.96) | 22.01 (3.13) | 22.51 (3.13) | 20.37 (3.13) | 22.06 (2.87) | 22.46 (3.07) | 20.97 (2.91) |
| Bachelor | 10.01 (1.41) | 10.24 (1.42) | 9.58 (1.26) | 10.03 (1.39) | 10.23 (1.39) | 9.26 (1.28) | 10.02 (1.39) | 10.37 (1.48) | 9.18 (1.33) |
| Transfer Payments Included | | | | | | | | | |
| Married | 29.01 (3.44) | 29.31 (4.13) | 29.17 (4.58) | 29.42 (4.17) | 29.36 (4.14) | 26.83 (3.79) | 29.55 (4.22) | 29.40 (4.15) | 27.60 (3.89) |
| Bachelor | 17.34 (2.53) | 17.04 (2.44) | 18.75 (2.73) | 17.38 (2.50) | 17.07 (2.45) | 19.08 (2.76) | 17.52 (2.54) | 17.15 (2.46) | 19.69 (2.79) |

TABLE 5.6.---Averages and Standard Deviations of Social Benefit-Cost Ratios for Semi-Skilled Workers.

| Family Status | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------|--|------------------|------------------|---|------------------|------------------|---|------------------|------------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Educational Costs Not Included | | | | | | | | | |
| Married | 21.14 (4.10) | 21.60 (4.19) | 19.99 (4.55) | 21.14 (4.10) | 21.57 (4.18) | 19.47 (3.82) | 21.13 (4.10) | 21.92 (4.12) | 20.09 (3.62) |
| Bachelor | 9.61 (1.86) | 9.81 (1.90) | 8.70 (1.68) | 9.61 (1.86) | 9.80 (1.90) | 8.87 (1.72) | 9.60 (1.86) | 9.77 (1.89) | 9.12 (1.77) |
| Educational Costs Included | | | | | | | | | |
| Married | 3.34 (.20) | 6.68 (.51) | 8.69 (.85) | 3.15 (.19) | 6.02 (.40) | 7.75 (.69) | 2.82 (.17) | 5.09 (.39) | 6.18 (.47) |
| Bachelor | 1.52 (.09) | 2.97 (.18) | 3.94 (.39) | 1.43 (.09) | 2.73 (.26) | 3.52 (.35) | 1.28 (.07) | 2.31 (.17) | 2.81 (.21) |

TABLE 5.7.--Averages and Standard Deviations of Social Benefit-Cost Ratios for Skilled Workers.

| Family Status | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------|--|------------------|------------------|---|------------------|------------------|---|------------------|------------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Educational Costs Not Included | | | | | | | | | |
| Married | 16.79 (4.02) | 17.15 (4.11) | 15.21 (3.64) | 16.78 (4.02) | 17.12 (4.11) | 15.50 (3.72) | 16.78 (4.02) | 17.08 (4.09) | 15.95 (3.82) |
| Bachelor | 7.62 (1.83) | 7.79 (1.87) | 6.91 (1.78) | 7.62 (1.82) | 7.78 (1.86) | 7.04 (1.83) | 7.62 (1.83) | 7.76 (1.86) | 7.24 (1.74) |
| Educational Costs Included | | | | | | | | | |
| Married | 1.02 (.06) | 2.27 (.17) | 3.81 (.39) | .95 (.05) | 2.01 (.14) | 3.20 (.31) | .85 (.05) | 1.65 (.12) | 2.42 (.21) |
| Bachelor | .53 (.04) | 1.10 (.28) | 1.73 (.17) | .50 (.03) | 1.05 (.08) | 1.47 (.13) | .44 (.03) | .85 (.07) | 1.09 (.09) |

TABLE 5.8.--Averages and Standard Deviations of Social Benefit-Cost Ratios for Technicians.

| Family Status | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------|--|------------------|------------------|---|------------------|------------------|---|------------------|------------------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Educational Costs Not Included | | | | | | | | | |
| Married | 11.63 (2.57) | 11.88 (2.63) | 10.54 (2.33) | 11.63 (2.58) | 11.87 (2.63) | 10.74 (2.38) | 10.62 (2.58) | 11.84 (2.62) | 11.05 (2.45) |
| Bachelor | 5.28 (1.18) | 5.39 (1.20) | 4.87 (1.06) | 5.28 (1.17) | 5.38 (1.19) | 4.85 (1.07) | 5.28 (1.17) | 5.37 (1.19) | 4.83 (1.04) |
| Educational Costs Included | | | | | | | | | |
| Married | .74 (.06) | 1.67 (.14) | 2.46 (.23) | .70 (.06) | 1.48 (.13) | 2.09 (.19) | .62 (.05) | 1.20 (.10) | 1.54 (.13) |
| Bachelor | .34 (.03) | .76 (.06) | 1.11 (.11) | .32 (.05) | .67 (.06) | .94 (.08) | .27 (.03) | .54 (.04) | .70 (.06) |

I.2.2. Transfer Payments Included.--According to one view, migrant workers' training costs can be regarded not as a means of helping them to get better jobs, but as an investment by the society in human capital, the return in which is obtained when the migrant worker repatriates savings and remittances from abroad. Taking into account the educational costs embodied as investment in human capital in each migrant, and keeping all the other assumptions, several results can be drawn from Tables 5.5., 5.6, 5.7, and 5.8.

(1) The higher the investment in human capital embodied in each migrant, the lower the BCRs for a ten-year stay abroad. While the average BCR for the married semi-skilled worker at a 5 percent discount rate and for a ten-year stay is 8.69, it is only 3.81 for the married skilled worker, and 2.46 for the married technician. At a 20 percent discount rate, the BCR is equal to 2.81 for the semi-skilled bachelor, 1.09 for the skilled bachelor, and only .70 for the bachelor technician (or 25 percent of the BCR for the semi-skilled worker, while the difference in the investment of human capital made is about 86 percent lower for the semi-skilled worker).

(2) The longer the period of stay abroad, the higher the returns on investment in human capital embodied in each worker. From Tables 5.5 to 5.8, we see that, for married semi-skilled migrants, the BCR increases from .74

for periods of stay of two years to 2.46 (or by 3.3 times) for ten year stays. The BCR increases for married skilled migrants from 1.02 to 3.81 (or by 3.7 times) at a 5 percent discount rate, and for the married technicians, also at a 5 percent rate, the BCR increases from .74 to 2.46 (or 3.2 times).

(3) A comparison between the figures in Table 5.5 to 5.8 suggests that the returns on educational investment are much higher for married migrant workers than for bachelors. At a 20 percent discount rate, the average BCR for periods of stay of ten years is 6.81 (or 35 percent) for semi-skilled bachelors (Table 5.6). At the same discount rate and for the same period of stay, the BCR is 2.42 for skilled marrieds, while it is 1.09 for skilled bachelors (Table 5.7). Table 5.8 shows that the BCR for married technicians is 1.54, while it is .70 for bachelors (a decrease of 55 percent).

(4) Taking into account not only educational social costs, but also other social costs, such as health, will have the effect of lowering the values of BCRs. For some occupational categories it would then pay not to encourage migration.

(5) When educational social costs are included, the country of origin seems to bear a heavy share of total real costs associated with the migration of its people. This fact suggests there is some asymmetry in the burden of

costs between individual migrants and society. Population shifts result in costs as well as benefits, and the people who bear the costs are often not those who reap the benefits. Serious inequities do arise. Social BCRs (not including educational costs) exceed social BCRs (including such costs) simply because migration is subsidized in various ways by the society (the educational investment) and the subsidies are never adequately recouped by subsequent income taxation of the earnings of the migrant workers.

(6) Unaccompanied married workers tend to repatriate more foreign exchange, so that there is a temptation to discourage family emigration. Here there is a direct conflict of interest between the welfare of the migrants themselves and the policy of using emigration to obtain foreign exchange.

(7) Although there is no unemployment benefit program in Tunisia, we will consider a case where there are some increasing benefits due to a reduction in transfer payments because of the departure of some unskilled workers who have been previously enrolled in the CLCSD. Table 5.5 indicates that, for married migrant workers, BCRs increase by 25 percent between a situation that does not include transfer payments and a situation that does for a ten-year stay abroad. These BCRs indicate that since no human capital is embodied in these unskilled workers (cf.

Appendix 2), the only social costs are the administrative costs incurred by the OTTEFP, for helping potential migrants. These social BCRs (Table 5.5) are higher than the private BCRs for unskilled workers (Table 5.1).

The figures about the private BCRs suggest that the gains associated with international migration are substantial enough to more than offset any reasonable direct costs. The functioning of this process is rather rational. People migrate to foreign countries looking for jobs because they are better there than any opportunity available to them in the home country. The social BCRs of this "de facto" migration, although substantially high, raise some important policy questions. It is very difficult to assess the overall dynamic effects of this phenomenon since they are largely nonquantifiable.

II. Some Nonquantifiable Effects of International Migration

It is difficult to quantify some effects. The model of cost-benefit analysis of migration is expressed here in terms of economic efficiency, but there are other relevant nonquantifiable effects of emigration. These are dispersed throughout the economy and have a major effect in a certain number of areas (agricultural production, industrial production, rural-urban migration, education of the children of the migrant workers, crime in the cities, and so forth). These effects may be identified as

externalities, or indirect side effects or spillover impacts which result from a decision. Not considered a direct benefit or cost, externalities inflict harm on someone without compensating him for it, or confer gain on someone without demanding payment. The more significant of these are considered below.

II.1. The "Selectivity of Migration"

Demographers call migration "selective" in the sense that the migrants do not represent a random sample of the population. Workers who take jobs abroad are generally more mobile, more active and enterprising, and more physically fit for hard work. When outstanding individuals leave, it is true that society loses far more than the services for which these individuals are compensated. Empirically, the significant question is whether there is an unusual concentration of individuals of this category among those who contribute to the statistics of migration. There are few "hard" data which one might cite. If among the emigrating workers there is a "disproportionate concentration of the broad spectrum of leadership attributes,"¹ this will cause a decrease in the quantity of the country's human stock and will influence national welfare in the long run.

¹Subbiah Kannappan, "The Brain Drain and Developing Countries," International Labour Review 98, No. 1 (January 1968), 1-26.

II.2. The Effects on Production

When there is an aggregate labor surplus, emigration does relieve unemployment. But emigration may involve more than the removable surplus, in particular, employed skilled workers. Their withdrawal leaves gaps in the domestic labor market, occasions replacement costs, hinders development, and induces new unemployment and further emigration. What are the effects of international migration on the production of the agricultural and industrial sectors?

II.2.1. The Production of the Agricultural Sector.--The outflow of labor almost certainly affects the economic development of the agricultural sector. Owing to migration, many people are no longer available at home, and animal husbandry and agriculture may suffer. In the absence of such emigration, there may be less need for internal migration, and the resources available may suffice to provide the remaining local population with a tolerable standard of living. Conversely, emigration may maintain or reinforce the existing backwardness and therefore increase the push factors behind the rural exodus. What some have called "the agricultural brain drain" hinders the setting up of viable rural centers. As old people find the work increasingly difficult and become less able to introduce agricultural innovations or absorb new ideas,

there seems more reason for the young to depart. Moreover, the flow of money into the traditional setting, and the accompanying new ideas and expectations tend to perpetuate out-migration. The general economic advantage or disadvantage to the rural economy can be determined, at least in the short run, by balancing benefits thus obtained against the costs suffered by the village economy as the result of the absence of men. The necessary data for drawing up such a balance sheet in quantitative terms do not exist.

I.2.2. The Production of the Industrial Sector.--

Two or three years ago, increasing numbers of highly skilled workers began to leave their jobs in Tunisia to take employment abroad. Some employers have complained that they have become training schools for workers who leave for foreign countries and that this has led to rising labor costs. As a rule, OTTEEFP will not assist the emigration plans of workers who are needed in the domestic economy or whose employers are reluctant to have them take a job abroad. But many of these workers do not find it difficult to secure jobs abroad through other channels. According to employers, the shortage of skilled workers as a result of emigration has become a limiting factor for the development of individual firms and industries (especially in the mechanical, chemical, and construction industries). Emigration may alter the relative quantities available of educated

people and of cooperant factors of production. But care should be taken to distinguish between chronic and perhaps even endemic shortages confronting individual segments or sectors of the economy and general shortages. A shortage may arise not only because individuals leave certain sectors and shift supply functions leftwards, but also because of increases in demand. But how serious are national, as opposed to sectorial, shortages? Adverse consequences for the economy as a whole are difficult to reconcile with reports of widespread unemployment, including educated unemployment. Shortages and surpluses are relative terms, indicating the relationship between demand and supply, at prevailing levels of remuneration.

II.3. International Emigration and the Price Level

The emigrant's government faces two potential sources of inflation: that arising from skilled labor shortages caused by migrant departures and that caused by unexpected increases in spending out of repatriated earnings.

We tested in a linear regression model the inflationary pressure on wages caused by emigration. We regressed the compound growth rates of average real yearly wages ($GRAW_i$) for the period 1961-1971 for each industrial sector i ($i = 1, 2, \dots, 12$); on the compound growth rates of annual value added ($GRAV_i$) per annum for the same

period; and the emigration pressure rate (EMR_i), defined as the ratio of total emigrant workers to France for the period (1967-1972 in sector i to the total permanent employment for the industrial sectors in Tunisia plus the emigrants to France. The equation that has been estimated is

$$GRAW_i = \alpha + \beta GRAV_i + \varepsilon EMR_i. \quad (5.1)$$

But a least squares estimate for this regression model yields a poor correlation coefficient ($R^2 = .293$). It seems, therefore, that until 1972 the emigration pressure was not so great as to affect wage levels and cost-push inflation.

Remittances, which constitute the important benefit in the social cost-benefit analysis, may have counter effects by causing inflation. To what extent has expenditure from repatriated earnings contributed to inflation? Receipt of savings and remittances after the introduction of a labor export policy need not have an inflationary impact if the government uses the foreign exchange equivalent of the savings and remittances to create the capacity to supply the commodities demanded by those spending the domestic currency equivalent. There is also not very much evidence as to whether or not returned workers' demand for other commodities has had an inflationary impact.

Excess capacity has been a perennial problem for many Tunisian industries (see Chapter II, Section IV.1.2), so that often an unexpected increase in demand can be met with existing resources (housing not included).

The discussion in this section has been sufficient to suggest that, given our present state of knowledge, it is almost impossible to quantify many externalities. We cannot emphasize too strongly that this is not a sound reason for ignoring externalities. Rather, it is one of the most serious limitations of social cost-benefit analysis.

III. The Future of the Migrant Labor System

Accurate prediction of actual migration flows in the future is very difficult. Simple historical trends are poor guides because conditions prevailing during the 1950s and 1960s are unlikely to be repeated. In the 1970s new conditions are emerging, complicated by such factors as very high inflation rates, currency realignments, the energy crisis, and so forth. Two areas will be examined in this section: the problem of returnees and possible supply and demand characteristics of the future migrant labor system.

III.1. The Returnees

There is no agreement as to how many Tunisian migrants have returned home. Little information exists as

to the number of returnees, the nature of their experience, the possible changes in job status, the sectorial impact of their return, and the social effects of returning migrant workers.

Many see the returning migrants as persons enriched by their sojourn abroad in terms of skill, knowledge, and learning capacity, and thus as representing an increase in the human capital stock. It has been argued that migrants have benefited through learning and are more used to the discipline of industrial life and are enriched in terms of behavioral norms. But the utilization of returnees is not very satisfactory in the more challenging LDC context for several reasons.

First, emigrant workers abroad are extremely mistrustful of the labor market in their countries of origin. Generally, they do not believe they can find jobs at home which correspond to their new qualifications and pretensions.

Second, the occupational reintegration of emigrants seems to be essentially outside the wage earning sectors as different articles in the local press report.

Third, as a general rule, the first to come back are the least able, those who have encountered the most difficulties in adjusting to the new living and working

conditions. Firms and employers are reluctant to recruit such workers.²

The human capital approach to returnees is based on some unfounded assumptions: (1) that the foreign-trained supply of industrial skills matches the home demand for them; (2) that no significant training costs are associated with the integration of returning migrants; (3) that the skills the migrant has learned abroad through on-the-job or formal training may not be useful, given the prevailing production techniques at home; and (4) that since at least one-third of the migrant workers are employed in unskilled positions, no skills are imparted to them.

The productive integration of returning migrants into the development process of the home country presupposes that the home country has a defined employment and manpower policy. A returnee policy must begin with the out-migration potential before it leaves the home country. Such a policy should deny migration assistance to those from industries or occupations with actual or pending shortages of labor; select those with a high propensity to return (for example, married migrants); guide out-migrants to rewarding jobs in terms of acquisition of skills and experience; and extend the information system to give migrants abroad knowledge of economic, employment, and housing opportunities at home.

²Bernard Kayser, Cyclically-determined Homeward Flows of Migrant Workers (Paris: OECD, 1972).

III.2. The Prospects for Migration

Previous chapters have shown that the migration of labor is a complex phenomenon which, although heavily influenced by economic factors, may also be subject to a significant range of institutional and other noneconomic factors. Nevertheless, it is possible to make quantitative projections which can give a general idea of the possible magnitudes involved.

III.2.1. The Demand for Migrant Labor.--The United Nations Economic Commission for Europe's (UNECE) Economic Survey of Europe (1969) contained a detailed quantitative projection of individual country labor deficits (and hence an implicit demand for foreign labor) in 1980 for twelve European countries. The results of this projection show an overall total deficit of between 11.7 and 12.3 million workers (4.5 million in Germany alone) for the period 1965/67-1980.

The temptation to view the migration of labor in purely economic terms should be tempered by recent political developments in some receiving countries.³ Switzerland attempted to stabilize its migrant labor force in Spring 1971 and then introduced a cut in the number of entry permits in July 1973. Since October 1972 in Holland, November 1973 in Germany, and July 1974 in France, new

³The Economist, December 1, 1973; August 9, 1975; and January 31, 1976.

restrictions on new entrants (except from EEC countries) were enacted. Although these countries attributed their policy to the oil crisis, there is some evidence that this was merely a catalyst. This made the change in migration policy politically feasible for governments which felt that this was the only way to cope with social and political problems to which their ineffective management of the emigrant labor system had led. The major deficiencies of the labor import system can be summed up as follows:

(1) the availability of mobile manpower is said to have accelerated agglomeration and industrial concentration. Thus, the deficiencies of social infrastructure have become most visible in large cities; (2) the unlimited supply of unskilled workers has obstructed technical progress and inhibited necessary structural changes in the economy; and (3) the inflow of young and able foreign workers may have forced women and older workers out of the labor market.

But the effectiveness of the measures taken will depend on the degree to which it is possible to substitute national workers for foreigners and capital for labor, make more efficient use of domestic manpower, and transfer production to other countries.

There is still the need to do the socially undesirable jobs. These low wage jobs offer poor working conditions and low social status. A combination of higher aspirations inspired by better education and favorable

economic conditions have led to the disaffection of national workers with the whole range of jobs at the bottom end of the social scale. These jobs and all unskilled work are turned over almost entirely to immigrants.

Although Western Europe host countries seem to have abandoned further reliance on mass immigration, it is possible that a similar system may be introduced in the future in some of the sparsely populated oil producing countries. The additional manpower required for Saudi Arabia's five-year plan (1975-1980) is about 232,000 Saudis and nearly 500,000 foreigners.⁴

III.2.2. The Supply of Migrant Labor.--Tunisia's labor force increases by nearly 56,700 workers annually (see Table 5.9). During the decade 1976-1986 the increase in the labor force is thought likely to be about 567,600 workers (see Table 5.9). Given present policies the prospect for a corresponding increase in employment in Tunisia is not favorable. Even assuming a zero level of unemployment at present and no change in the level of rural underemployment, several possibilities for Tunisia's future could be postulated. First, given the physical limitations on agricultural land and water, the chances of absorbing even a small part of the increase in the labor force in

⁴The Economist, August 9, 1975.

TABLE 5.9.--Assumed Evolution of Employment (in thousands).

| Sectors | 1972 | 1976 | 1980 | 1984 | 1986 | Increase 1976-1986 |
|--------------------------|---------|---------|---------|---------|---------|-----------------------|
| Agriculture | 530.0 | 511.2 | 559.5 | 614.4 | 644.7 | 114.7 |
| Mining | 19.0 | 16 | 16.0 | 16.0 | 16.0 | - 3 |
| Energy | 6.3 | 6.4 | 7.0 | 8.9 | 10.0 | 3.7 |
| Manufacturing | 125.9 | 173.2 | 226.3 | 299.8 | 346.5 | 221 |
| Construction | 55.0 | 78.9 | 84.4 | 102.0 | 113.7 | 58.7 |
| Transportation, Commerce | 37.5 | 44.7 | 50.5 | 59.7 | 65.7 | 28.2 |
| Tourism | 19.7 | 33.3 | 48.7 | 66.3 | 77.4 | 57.7 |
| Other Services | 151.0 | 171.1 | 190.3 | 221.8 | 242.1 | 91.1 |
| Government Services | 125.0 | 154.5 | 171.3 | 179.1 | 229.9 | 104.9 |
| Artisanat | 45.0 | 49.0 | 53.3 | 54.4 | 60.0 | 15 |
| Total | 1,115.0 | 1,238.7 | 1,407.7 | 1,462.1 | 1,806.1 | 691.2 |
| Labor Force | 1,541.0 | 1,682.1 | 1,816.9 | 1,862.7 | 2,108.6 | 567.6 |
| Unemployed | 426.0 | 443.0 | 409.2 | 400.6 | 302.4 | -123.6 |
| Rate of Unemployment (%) | .27 | .26 | .22 | .21 | .14 | -- |

Source: The Economic Development of Tunisia. A Basic Report. IBRD, Appendix Table, November 1973.

agriculture are very limited. Second, with the present level of technology and the consequent capital-labor ratios in industry, the industrial sector would be able in 1986 to absorb only about 346,500 workers (16 percent of the total labor force). Third, the expectation of employing the residual labor force of some 302,400 persons in construction, trade, and services is not realistic. Fourth, with the present rate of urbanization, reservoirs of unemployment in urban centers could develop which might have unfavorable social and political effects. As a possible solution to some of these problems, migration could bring relief and ease the strain on the labor market in the future.

The primary aim of this chapter has been to offer all the benefit-cost ratios for the different alternatives and hypotheses. Some elements also have been added to the theoretical framework developed in Chapter IV about externalities, returnees, and the prospects for the continuation of the present labor system based on emigration.

The following chapter reviews some conclusions and policy recommendations.

APPENDIX TO CHAPTER V

BENEFIT-COST RATIOS

TABLE A5.1.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|--|--|------|------|--|---|------|------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 5.48 | 8.75 | 9.03 | | 5.44 | 8.62 | 8.93 | | 5.34 | 8.24 | 7.48 | |
| Food, Beverages and Tobacco | 5.21 | 8.33 | 8.59 | | 5.17 | 8.20 | 8.50 | | 5.08 | 7.84 | 7.12 | |
| Construction Materials and Ceramics | 5.03 | 8.03 | 8.29 | | 4.99 | 7.91 | 8.20 | | 4.90 | 7.56 | 6.86 | |
| Mechanical and Electrical Industries | 5.44 | 8.69 | 8.97 | | 5.40 | 8.56 | 8.87 | | 5.30 | 8.18 | 7.43 | |
| Chemical Industries | 4.99 | 7.98 | 8.24 | | 4.96 | 7.86 | 8.15 | | 4.87 | 7.51 | 6.82 | |
| Textile, Clothing and Leather | 5.28 | 8.43 | 8.69 | | 5.23 | 8.29 | 8.60 | | 5.14 | 7.93 | 7.20 | |
| Wood and Furnishings | 5.20 | 8.31 | 8.58 | | 5.16 | 8.18 | 8.48 | | 5.07 | 7.82 | 7.10 | |
| Printing and Other Industries | 5.57 | 8.90 | 9.19 | | 5.53 | 8.76 | 9.08 | | 5.43 | 8.38 | 7.61 | |
| Construction | 5.00 | 8.00 | 8.25 | | 4.97 | 7.87 | 8.17 | | 4.88 | 7.53 | 6.86 | |
| Transportation | 5.12 | 8.19 | 8.45 | | 5.09 | 8.06 | 8.36 | | 4.99 | 7.71 | 7.00 | |
| Commerce | 5.25 | 8.39 | 8.66 | | 5.22 | 8.26 | 8.56 | | 5.12 | 7.89 | 7.17 | |
| Other Services | 4.65 | 7.43 | 7.67 | | 4.61 | 7.31 | 7.58 | | 4.53 | 6.99 | 6.35 | |
| Average | 5.18 | 8.28 | 8.55 | | 5.14 | 8.15 | 8.45 | | 5.05 | 7.79 | 7.08 | |
| Standard Deviation | .25 | .40 | .41 | | .25 | .39 | .41 | | .24 | .38 | .34 | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.2.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|-------|-------|--|--|-------|-------|--|---|-------|------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 6.25 | 9.99 | 10.30 | | 6.21 | 9.83 | 10.12 | | 6.09 | 9.39 | 8.53 | |
| Food, Beverages and Tobacco | 6.14 | 9.81 | 10.12 | | 6.10 | 9.66 | 10.00 | | 5.98 | 9.23 | 8.38 | |
| Construction Materials and Ceramics | 5.89 | 9.43 | 9.72 | | 5.85 | 9.27 | 9.62 | | 5.74 | 8.86 | 8.05 | |
| Mechanical and Electrical Industries | 6.23 | 9.95 | 10.27 | | 6.18 | 9.80 | 10.16 | | 6.07 | 9.36 | 8.50 | |
| Chemical Industries | 6.30 | 10.06 | 10.39 | | 6.25 | 9.91 | 10.27 | | 6.14 | 9.47 | 8.60 | |
| Textile, Clothing and Leather | 6.51 | 10.39 | 10.72 | | 6.46 | 10.23 | 10.61 | | 6.34 | 9.78 | 8.88 | |
| Wood and Furnishings | 6.33 | 10.13 | 10.45 | | 6.29 | 9.97 | 10.33 | | 6.18 | 9.52 | 8.65 | |
| Printing and Other Industries | 6.98 | 11.16 | 11.51 | | 6.93 | 10.98 | 11.39 | | 6.80 | 10.50 | 9.53 | |
| Construction | 6.08 | 9.72 | 10.03 | | 6.04 | 9.56 | 9.92 | | 5.92 | 9.14 | 8.30 | |
| Transportation | 6.08 | 9.72 | 10.03 | | 6.04 | 9.56 | 9.92 | | 5.92 | 9.14 | 8.30 | |
| Commerce | 6.28 | 10.03 | 10.35 | | 6.24 | 9.87 | 10.23 | | 6.12 | 9.43 | 8.57 | |
| Other Services | 5.49 | 8.78 | 9.06 | | 5.45 | 8.64 | 8.96 | | 5.35 | 8.26 | 7.50 | |
| Average | 6.21 | 9.93 | 10.24 | | 6.17 | 9.77 | 10.12 | | 6.05 | 9.34 | 8.48 | |
| Standard Deviation | .35 | .56 | .57 | | .35 | .55 | .57 | | .34 | .52 | .48 | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.3.--Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|-------|-------|------|--|-------|------|-------|---|---|---|----|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 7.44 | 11.88 | 12.26 | 7.38 | 11.70 | 12.13 | 7.25 | 11.18 | 10.15 | | | |
| Food, Beverages and Tobacco | 6.90 | 11.03 | 11.38 | 6.85 | 10.85 | 11.25 | 6.72 | 10.37 | 9.42 | | | |
| Construction Materials and Ceramics | 6.61 | 10.56 | 10.89 | 6.56 | 10.39 | 10.78 | 6.44 | 9.93 | 9.02 | | | |
| Mechanical and Electrical Industries | 7.39 | 11.81 | 12.18 | 7.34 | 11.62 | 12.05 | 7.20 | 11.11 | 10.09 | | | |
| Chemical Industries | 7.15 | 11.44 | 11.80 | 7.10 | 11.25 | 11.67 | 6.97 | 10.76 | 9.77 | | | |
| Textile, Clothing and Leather | 7.62 | 12.17 | 12.56 | 7.56 | 11.98 | 12.42 | 7.42 | 11.45 | 10.40 | | | |
| Wood and Furnishings | 7.34 | 11.74 | 12.11 | 7.29 | 11.55 | 11.98 | 7.16 | 11.04 | 10.03 | | | |
| Printing and Other Industries | 8.11 | 12.95 | 13.36 | 8.05 | 12.75 | 13.22 | 7.90 | 12.18 | 11.07 | | | |
| Construction | 7.03 | 11.24 | 11.59 | 6.98 | 11.06 | 11.47 | 6.85 | 10.57 | 9.60 | | | |
| Transportation | 6.85 | 10.95 | 11.30 | 6.80 | 10.77 | 11.17 | 6.68 | 10.30 | 9.35 | | | |
| Commerce | 7.21 | 11.53 | 11.90 | 7.16 | 11.35 | 11.77 | 7.03 | 10.85 | 9.85 | | | |
| Other Services | 6.12 | 9.78 | 10.09 | 6.07 | 9.62 | 9.98 | 5.96 | 9.20 | 8.35 | | | |
| Average | 7.14 | 11.42 | 11.78 | 7.09 | 11.24 | 11.65 | 6.96 | 10.74 | 9.76 | | | |
| Standard Deviation | .50 | .81 | .83 | .50 | .79 | .83 | .49 | .76 | .69 | | | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.4.--Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|-------|-------|--|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 9.56 | 15.28 | 15.76 | 9.49 | 15.04 | 15.59 | 9.31 | 14.37 | 13.05 |
| Food, Beverages and Tobacco | 7.91 | 12.64 | 13.07 | 7.85 | 12.44 | 12.90 | 7.71 | 11.89 | 10.80 |
| Construction Materials and Ceramics | 7.74 | 12.37 | 12.76 | 7.69 | 12.18 | 12.62 | 7.54 | 11.64 | 10.57 |
| Mechanical and Electrical Industries | 9.23 | 14.76 | 15.22 | 9.17 | 14.52 | 15.06 | 9.00 | 13.88 | 12.61 |
| Chemical Industries | 8.58 | 13.71 | 14.15 | 8.52 | 13.50 | 14.00 | 8.37 | 12.90 | 11.72 |
| Textile, Clothing and Leather | 8.58 | 13.72 | 14.15 | 8.52 | 13.50 | 14.00 | 8.37 | 12.90 | 11.72 |
| Wood and Furnishings | 8.72 | 13.94 | 14.37 | 8.66 | 13.71 | 14.22 | 8.49 | 13.11 | 11.90 |
| Printing and Other Industries | 8.52 | 15.22 | 15.70 | 9.45 | 14.98 | 15.53 | 9.28 | 14.31 | 13.00 |
| Construction | 8.08 | 15.92 | 13.33 | 8.03 | 12.71 | 13.18 | 7.88 | 12.15 | 11.04 |
| Transportation | 8.14 | 13.00 | 13.43 | 8.09 | 12.81 | 13.28 | 7.94 | 12.24 | 11.12 |
| Commerce | 8.37 | 13.39 | 13.81 | 8.32 | 13.18 | 13.66 | 8.16 | 12.59 | 11.44 |
| Other Services | 7.08 | 11.31 | 11.67 | 7.03 | 11.14 | 11.54 | 6.90 | 10.64 | 9.67 |
| Average | 8.37 | 13.77 | 13.95 | 8.15 | 13.31 | 13.79 | 8.24 | 12.71 | 11.55 |
| Standard Deviation | .66 | 1.34 | 1.21 | .93 | 1.16 | 1.20 | .72 | 1.11 | 1.00 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.5.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 5.26 | 8.54 | 8.91 | 5.22 | 8.39 | 8.80 | 4.71 | 7.99 | 8.46 |
| Food, Beverages and Tobacco | 5.01 | 8.13 | 8.48 | 4.97 | 7.98 | 8.38 | 4.49 | 7.60 | 8.05 |
| Construction Materials and Ceramics | 4.83 | 7.83 | 8.18 | 4.79 | 7.70 | 8.08 | 4.32 | 7.33 | 7.76 |
| Mechanical and Electrical Industries | 5.23 | 8.47 | 8.85 | 5.19 | 8.33 | 8.74 | 4.68 | 7.94 | 8.40 |
| Chemical Industries | 4.80 | 7.78 | 8.13 | 4.76 | 7.65 | 8.03 | 4.30 | 7.29 | 7.71 |
| Textile, Clothing and Leather | 5.07 | 8.21 | 8.58 | 5.03 | 8.07 | 8.47 | 4.54 | 7.69 | 8.14 |
| Wood and Furnishings | 5.01 | 8.10 | 8.46 | 4.26 | 7.97 | 8.36 | 4.47 | 7.59 | 8.03 |
| Printing and Other Industries | 5.35 | 8.68 | 9.06 | 5.31 | 8.53 | 8.95 | 4.79 | 8.13 | 8.60 |
| Construction | 4.81 | 7.80 | 8.14 | 4.77 | 7.67 | 8.04 | 4.31 | 7.30 | 7.73 |
| Transportation | 4.92 | 7.98 | 8.34 | 4.89 | 7.85 | 8.24 | 4.41 | 7.48 | 7.91 |
| Commerce | 5.05 | 8.18 | 8.54 | 5.01 | 8.04 | 8.44 | 4.52 | 7.66 | 8.11 |
| Other Services | 4.47 | 7.24 | 7.56 | 4.43 | 7.12 | 7.47 | 4.00 | 6.78 | 7.18 |
| Average | 4.98 | 8.07 | 8.43 | 4.88 | 7.94 | 8.33 | 4.46 | 7.56 | 8.00 |
| Standard Deviation | .24 | .39 | .40 | .31 | .38 | .40 | .21 | .36 | .39 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.6.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|-------|-------|--|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 6.01 | 9.73 | 10.16 | 5.96 | 9.57 | 10.00 | 5.38 | 9.12 | 9.65 |
| Food, Beverages and Tobacco | 5.90 | 9.57 | 9.99 | 5.85 | 9.40 | 9.87 | 5.28 | 8.96 | 9.48 |
| Construction Materials and Ceramics | 5.07 | 9.19 | 9.59 | 5.62 | 9.03 | 9.47 | 5.07 | 8.60 | 9.10 |
| Mechanical and Electrical Industries | 5.97 | 9.70 | 10.13 | 5.94 | 9.54 | 10.01 | 5.36 | 9.08 | 9.61 |
| Chemical Industries | 6.05 | 9.81 | 10.24 | 6.00 | 9.64 | 10.12 | 5.42 | 9.19 | 9.72 |
| Textile, Clothing and Leather | 6.25 | 10.13 | 10.58 | 6.20 | 9.96 | 10.45 | 5.60 | 9.49 | 10.04 |
| Wood and Furnishings | 6.09 | 9.87 | 10.31 | 6.04 | 9.70 | 10.18 | 5.45 | 9.24 | 9.78 |
| Printing and Other Industries | 6.71 | 10.87 | 11.36 | 6.66 | 10.69 | 11.22 | 6.01 | 10.18 | 10.78 |
| Construction | 5.84 | 9.47 | 9.89 | 5.80 | 9.31 | 9.77 | 5.23 | 8.87 | 9.39 |
| Transportation | 5.84 | 9.47 | 9.89 | 5.80 | 9.31 | 9.77 | 5.23 | 8.87 | 9.39 |
| Commerce | 6.03 | 9.78 | 10.21 | 5.98 | 9.61 | 10.08 | 5.40 | 9.15 | 9.69 |
| Other Services | 5.28 | 8.56 | 8.94 | 5.24 | 8.41 | 8.83 | 4.00 | 8.01 | 8.48 |
| Average | 5.92 | 9.67 | 10.10 | 5.92 | 9.51 | 9.89 | 5.28 | 9.06 | 9.59 |
| Standard Deviation | .42 | .54 | .57 | .33 | .53 | .42 | .46 | .51 | .54 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.7.--Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 12.65$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|-------|-------|--|--|-------|-------|--|---|-------|-------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 7.15 | 11.59 | 12.10 | | 7.09 | 11.39 | 11.95 | | 6.40 | 10.85 | 11.48 | |
| Food, Beverages and Tobacco | 6.63 | 10.75 | 11.23 | | 6.58 | 10.57 | 11.09 | | 5.94 | 10.07 | 10.65 | |
| Construction Materials and Ceramics | 6.35 | 10.29 | 10.75 | | 6.30 | 10.12 | 10.62 | | 5.68 | 9.64 | 10.20 | |
| Mechanical and Electrical Industries | 7.10 | 11.51 | 12.02 | | 7.04 | 11.32 | 11.87 | | 6.36 | 10.78 | 11.41 | |
| Chemical Industries | 6.87 | 11.14 | 11.64 | | 6.82 | 10.96 | 11.50 | | 6.16 | 10.44 | 11.05 | |
| Textile, Clothing and Leather | 7.32 | 11.87 | 12.39 | | 7.26 | 11.68 | 12.24 | | 6.55 | 11.11 | 11.76 | |
| Wood and Furnishings | 7.06 | 11.44 | 11.99 | | 7.00 | 11.25 | 11.80 | | 6.32 | 10.71 | 11.34 | |
| Printing and Other Industries | 7.79 | 12.62 | 13.19 | | 7.73 | 12.41 | 13.02 | | 6.97 | 11.82 | 12.51 | |
| Construction | 6.76 | 10.95 | 11.44 | | 6.71 | 10.77 | 11.30 | | 6.05 | 10.26 | 10.85 | |
| Transportation | 6.58 | 10.67 | 11.14 | | 6.53 | 10.49 | 11.01 | | 5.89 | 9.99 | 10.58 | |
| Commerce | 6.94 | 11.24 | 11.74 | | 6.88 | 11.05 | 11.59 | | 6.21 | 10.52 | 11.14 | |
| Other Services | 5.88 | 9.53 | 9.95 | | 5.83 | 9.37 | 9.83 | | 5.28 | 8.93 | 9.45 | |
| Average | 6.86 | 11.13 | 11.63 | | 6.81 | 10.94 | 11.48 | | 6.15 | 10.42 | 11.03 | |
| Standard Deviation | .48 | .79 | .82 | | .48 | .77 | .81 | | .43 | .73 | .78 | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.8.--Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = 0$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|-------|-------|------|--|-------|------|-------|---|---|---|----|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 9.19 | 14.89 | 15.55 | 9.12 | 14.64 | 15.36 | 8.23 | 13.94 | 14.76 | | | |
| Food, Beverages and Tobacco | 7.60 | 12.32 | 12.87 | 7.54 | 12.11 | 12.71 | 6.81 | 11.54 | 12.21 | | | |
| Construction Materials and Ceramics | 7.44 | 12.06 | 12.59 | 7.38 | 11.86 | 12.44 | 6.66 | 11.29 | 11.95 | | | |
| Mechanical and Electrical Industries | 8.87 | 14.38 | 15.02 | 8.81 | 14.14 | 14.84 | 7.94 | 13.47 | 14.25 | | | |
| Chemical Industries | 8.25 | 13.37 | 13.96 | 8.18 | 13.14 | 13.79 | 7.38 | 12.52 | 13.25 | | | |
| Textile, Clothing and Leather | 8.25 | 13.37 | 13.96 | 8.18 | 13.14 | 13.79 | 7.38 | 12.52 | 13.25 | | | |
| Wood and Furnishings | 8.38 | 13.58 | 14.18 | 8.31 | 13.35 | 14.01 | 7.50 | 12.72 | 13.46 | | | |
| Printing and Other Industries | 9.15 | 14.83 | 15.49 | 9.08 | 14.58 | 15.30 | 8.19 | 13.89 | 14.70 | | | |
| Construction | 7.77 | 12.59 | 13.15 | 7.71 | 12.38 | 12.99 | 6.96 | 11.79 | 12.48 | | | |
| Transportation | 7.83 | 12.68 | 13.25 | 7.76 | 12.47 | 13.08 | 7.01 | 11.88 | 12.57 | | | |
| Commerce | 8.05 | 13.05 | 13.63 | 7.99 | 12.83 | 13.46 | 7.21 | 12.22 | 12.93 | | | |
| Other Services | 6.80 | 11.03 | 11.52 | 6.75 | 10.84 | 11.37 | 6.09 | 10.33 | 10.90 | | | |
| Average | 8.13 | 13.17 | 13.76 | 8.06 | 12.95 | 13.59 | 7.28 | 12.13 | 13.05 | | | |
| Standard Deviation | .71 | 1.14 | 1.19 | .70 | 1.13 | 1.18 | .63 | 1.07 | 1.14 | | | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.9.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.24 | 6.82 | 7.11 | 4.21 | 6.71 | 7.02 | 4.13 | 6.41 | 5.87 |
| Food, Beverages and Tobacco | 4.06 | 6.54 | 6.81 | 4.04 | 6.43 | 6.73 | 3.96 | 6.15 | 5.63 |
| Construction Materials and Ceramics | 3.97 | 6.38 | 6.64 | 3.94 | 6.27 | 6.56 | 3.86 | 5.99 | 5.48 |
| Mechanical and Electrical Industries | 4.46 | 7.17 | 7.44 | 4.43 | 7.05 | 7.36 | 4.34 | 6.73 | 6.15 |
| Chemical Industries | 4.06 | 6.53 | 6.79 | 4.03 | 6.42 | 6.71 | 3.96 | 6.14 | 5.61 |
| Textile, Clothing and Leather | 4.12 | 6.63 | 6.91 | 4.10 | 6.53 | 6.83 | 4.02 | 6.24 | 5.71 |
| Wood and Furnishings | 4.44 | 7.12 | 7.39 | 4.41 | 7.01 | 7.31 | 4.33 | 6.70 | 6.11 |
| Printing and Other Industries | 4.47 | 7.18 | 7.47 | 4.43 | 7.06 | 7.38 | 4.35 | 6.75 | 6.17 |
| Construction | 4.18 | 6.71 | 6.97 | 4.15 | 6.60 | 6.89 | 4.07 | 6.31 | 5.76 |
| Transportation | 4.02 | 6.47 | 6.73 | 3.99 | 6.36 | 6.65 | 3.92 | 6.08 | 5.56 |
| Commerce | 4.14 | 6.67 | 6.94 | 4.12 | 6.56 | 6.86 | 4.04 | 6.27 | 5.73 |
| Other Services | 3.75 | 6.03 | 6.27 | 3.73 | 5.94 | 6.21 | 3.66 | 5.67 | 5.19 |
| Average | 4.15 | 8.68 | 6.95 | 4.13 | 6.57 | 6.87 | 4.05 | 6.28 | 5.74 |
| Standard Deviation | .21 | .34 | .35 | .21 | .33 | .34 | .21 | .32 | .29 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.10.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 5.01 | 8.05 | 8.38 | 4.98 | 7.92 | 8.28 | 4.88 | 7.57 | 6.92 |
| Food, Beverages and Tobacco | 4.61 | 7.42 | 7.75 | 4.58 | 7.31 | 7.66 | 4.49 | 6.98 | 6.40 |
| Construction Materials and Ceramics | 4.88 | 7.83 | 8.14 | 4.84 | 7.70 | 8.00 | 4.75 | 7.36 | 6.72 |
| Mechanical and Electrical Industries | 4.92 | 7.90 | 8.23 | 4.88 | 7.77 | 8.13 | 4.79 | 7.43 | 6.79 |
| Chemical Industries | 4.81 | 7.74 | 8.07 | 4.78 | 7.62 | 7.98 | 4.69 | 7.28 | 6.67 |
| Textile, Clothing and Leather | 4.97 | 8.01 | 8.35 | 4.94 | 7.88 | 8.25 | 4.85 | 7.53 | 6.89 |
| Wood and Furnishings | 5.45 | 8.74 | 9.06 | 5.41 | 8.60 | 8.96 | 5.31 | 8.21 | 7.49 |
| Printing and Other Industries | 5.83 | 9.37 | 9.73 | 5.79 | 9.22 | 9.62 | 5.68 | 8.81 | 8.04 |
| Construction | 4.51 | 7.26 | 7.58 | 4.48 | 7.15 | 7.49 | 4.39 | 6.83 | 6.26 |
| Transportation | 4.72 | 7.59 | 7.91 | 4.69 | 7.47 | 7.82 | 4.60 | 7.14 | 6.54 |
| Commerce | 4.97 | 7.98 | 8.31 | 4.93 | 7.85 | 8.21 | 4.84 | 7.50 | 6.86 |
| Other Services | 4.33 | 6.96 | 7.25 | 4.30 | 6.85 | 7.17 | 4.22 | 6.55 | 5.99 |
| Average | 4.91 | 7.90 | 8.23 | 4.88 | 7.77 | 8.13 | 4.79 | 7.43 | 6.79 |
| Standard Deviation | .40 | .64 | .65 | .39 | .63 | .64 | .39 | .60 | .54 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.11.--Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|-------|-------|--|-------|-------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.55 | 7.37 | 7.70 | 4.52 | 7.26 | 7.67 | 4.43 | 6.92 | 6.40 |
| Food, Beverages and Tobacco | 5.33 | 8.58 | 8.94 | 5.30 | 8.44 | 8.83 | 5.20 | 8.06 | 7.38 |
| Construction Materials and Ceramics | 3.98 | 6.45 | 6.80 | 3.95 | 6.35 | 6.72 | 3.88 | 6.06 | 5.60 |
| Mechanical and Electrical Industries | 5.82 | 9.36 | 9.57 | 5.78 | 9.21 | 9.64 | 5.68 | 8.80 | 8.05 |
| Chemical Industries | 4.99 | 8.06 | 8.43 | 4.96 | 4.92 | 8.33 | 4.86 | 7.57 | 6.96 |
| Textile, Clothing and Leather | 6.05 | 9.72 | 10.12 | 6.01 | 9.57 | 10.00 | 5.89 | 9.14 | 8.36 |
| Wood and Furnishings | 5.82 | 9.35 | 9.73 | 5.78 | 9.20 | 9.62 | 5.67 | 8.79 | 8.04 |
| Printing and Other Industries | 6.32 | 10.17 | 10.59 | 6.28 | 10.01 | 10.47 | 6.16 | 9.56 | 8.75 |
| Construction | 5.29 | 8.51 | 8.88 | 5.25 | 8.38 | 8.78 | 5.15 | 8.00 | 7.33 |
| Transportation | 4.09 | 6.64 | 7.01 | 4.06 | 6.53 | 6.92 | 3.93 | 6.24 | 5.77 |
| Commerce | 5.65 | 9.08 | 9.46 | 5.61 | 8.94 | 9.35 | 5.51 | 8.54 | 7.82 |
| Other Services | 4.63 | 7.45 | 7.77 | 4.60 | 7.33 | 7.68 | 4.51 | 7.00 | 6.42 |
| Average | 5.21 | 8.39 | 8.75 | 5.17 | 8.01 | 8.66 | 5.07 | 7.89 | 7.24 |
| Standard Deviation | .76 | 1.21 | 1.22 | .76 | 1.53 | 1.21 | .75 | 1.14 | 1.02 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.12.--Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|-------|-------|--|-------|-------|---|-------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 5.57 | 9.04 | 9.55 | 5.53 | 8.89 | 9.43 | 5.43 | 8.49 | 7.86 |
| Food, Beverages and Tobacco | 5.19 | 8.39 | 8.81 | 5.16 | 8.26 | 8.71 | 5.06 | 7.89 | 7.27 |
| Construction Materials and Ceramics | 4.97 | 8.04 | 8.45 | 4.93 | 7.91 | 8.34 | 4.84 | 7.55 | 6.96 |
| Mechanical and Electrical Industries | 6.13 | 9.91 | 10.40 | 6.09 | 9.75 | 10.27 | 5.98 | 9.31 | 8.57 |
| Chemical Industries | 5.15 | 8.35 | 8.80 | 5.11 | 8.21 | 8.69 | 5.01 | 7.84 | 7.25 |
| Textile, Clothing and Leather | 5.87 | 9.47 | 9.92 | 5.82 | 9.31 | 9.80 | 5.71 | 8.89 | 8.18 |
| Wood and Furnishings | 6.61 | 10.64 | 11.09 | 6.56 | 10.47 | 10.96 | 6.44 | 10.00 | 9.16 |
| Printing and Other Industries | 6.36 | 10.04 | 10.54 | 6.17 | 9.88 | 10.41 | 6.05 | 9.43 | 8.69 |
| Construction | 3.67 | 6.02 | 6.46 | 3.64 | 5.92 | 6.37 | 3.58 | 5.65 | 5.30 |
| Transportation | 3.97 | 6.49 | 6.93 | 3.94 | 6.39 | 6.85 | 3.87 | 6.09 | 5.69 |
| Commerce | 5.24 | 8.48 | 8.92 | 5.20 | 8.34 | 8.82 | 5.10 | 7.96 | 7.35 |
| Other Services | 4.10 | 6.66 | 7.00 | 4.07 | 6.55 | 6.95 | 4.00 | 6.26 | 5.79 |
| Average | 5.23 | 8.46 | 8.90 | 5.18 | 8.32 | 8.80 | 5.08 | 7.94 | 7.33 |
| Standard Deviation | .94 | 1.47 | 1.50 | .02 | 1.45 | 1.48 | .90 | 1.38 | 1.24 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.13.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 3.96 | 6.46 | 6.82 | 3.93 | 6.35 | 6.73 | 3.54 | 6.04 | 6.46 |
| Food, Beverages and Tobacco | 3.80 | 6.20 | 6.54 | 3.77 | 6.09 | 6.46 | 3.40 | 5.80 | 6.19 |
| Construction Materials and Ceramics | 3.71 | 6.05 | 6.38 | 3.68 | 5.95 | 6.30 | 3.32 | 5.66 | 6.04 |
| Mechanical and Electrical Industries | 4.10 | 6.83 | 7.19 | 4.16 | 6.27 | 7.10 | 3.75 | 6.39 | 6.81 |
| Chemical Industries | 3.82 | 6.22 | 6.55 | 3.78 | 6.11 | 6.47 | 3.41 | 5.82 | 6.20 |
| Textile, Clothing and Leather | 3.85 | 6.29 | 6.64 | 3.82 | 6.18 | 6.55 | 3.45 | 5.89 | 6.29 |
| Wood and Furnishings | 4.19 | 6.82 | 7.17 | 4.16 | 6.71 | 7.08 | 3.75 | 6.39 | 6.80 |
| Printing and Other Industries | 4.18 | 6.83 | 7.20 | 4.15 | 6.71 | 7.10 | 3.75 | 6.39 | 6.80 |
| Construction | 3.94 | 6.42 | 6.75 | 3.91 | 6.30 | 6.66 | 3.52 | 6.01 | 6.39 |
| Transportation | 3.76 | 6.14 | 6.47 | 3.73 | 6.03 | 6.39 | 3.36 | 5.74 | 6.13 |
| Commerce | 3.88 | 6.33 | 6.68 | 3.85 | 6.22 | 6.59 | 3.47 | 5.92 | 6.32 |
| Other Services | 3.52 | 5.74 | 6.05 | 3.50 | 5.65 | 5.98 | 3.15 | 5.38 | 5.73 |
| Average | 3.90 | 6.36 | 6.70 | 3.87 | 6.21 | 6.61 | 3.48 | 5.95 | 6.34 |
| Standard Deviation | .21 | .33 | .35 | .20 | .29 | .34 | .18 | .31 | .33 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.14.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.70 | 7.66 | 8.07 | 4.66 | 7.53 | 7.97 | 4.20 | 7.17 | 7.64 |
| Food, Beverages and Tobacco | 4.29 | 7.00 | 7.41 | 4.25 | 6.88 | 7.31 | 3.84 | 6.55 | 7.01 |
| Construction Materials and Ceramics | 4.59 | 7.47 | 7.87 | 4.55 | 7.35 | 7.77 | 4.11 | 7.00 | 7.45 |
| Mechanical and Electrical Industries | 4.60 | 7.50 | 7.91 | 4.56 | 7.37 | 7.81 | 4.11 | 7.02 | 7.49 |
| Chemical Industries | 4.48 | 7.32 | 7.74 | 4.45 | 7.20 | 7.64 | 4.01 | 6.85 | 7.32 |
| Textile, Clothing and Leather | 4.64 | 7.57 | 8.00 | 4.60 | 7.44 | 7.90 | 4.15 | 7.08 | 7.57 |
| Wood and Furnishings | 5.15 | 8.38 | 8.80 | 5.11 | 8.24 | 8.69 | 4.61 | 7.84 | 8.34 |
| Printing and Other Industries | 5.50 | 8.95 | 9.42 | 5.45 | 8.80 | 9.30 | 3.75 | 8.38 | 8.92 |
| Construction | 4.19 | 6.84 | 7.24 | 4.15 | 6.72 | 7.14 | 3.53 | 6.40 | 6.85 |
| Transportation | 4.41 | 7.20 | 7.60 | 4.37 | 7.07 | 7.50 | 3.36 | 6.73 | 7.19 |
| Commerce | 4.64 | 7.57 | 7.99 | 4.61 | 7.45 | 7.89 | 3.47 | 6.71 | 7.57 |
| Other Services | 4.05 | 6.61 | 6.98 | 4.02 | 6.50 | 6.89 | 3.15 | 6.19 | 6.06 |
| Average | 4.60 | 7.50 | 7.91 | 4.56 | 7.37 | 7.81 | 3.85 | 6.99 | 7.45 |
| Standard Deviation | .39 | .64 | .66 | .39 | .63 | .65 | .41 | .61 | .71 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.15.--Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 12.65$; $E_0 = .63$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|-------|--|------|-------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.09 | 6.74 | 7.22 | 4.06 | 6.63 | 7.12 | 3.67 | 6.30 | 6.81 |
| Food, Beverages and Tobacco | 4.98 | 8.12 | 8.58 | 4.94 | 7.98 | 8.47 | 4.45 | 7.60 | 8.12 |
| Construction Materials and Ceramics | 3.57 | 5.89 | 6.31 | 3.54 | 5.78 | 6.22 | 3.20 | 5.50 | 5.95 |
| Mechanical and Electrical Industries | 5.45 | 8.89 | 9.38 | 5.40 | 8.74 | 9.26 | 4.88 | 8.32 | 8.88 |
| Chemical Industries | 4.59 | 7.52 | 7.99 | 4.55 | 7.39 | 7.88 | 4.11 | 7.04 | 7.55 |
| Textile, Clothing and Leather | 5.67 | 9.24 | 9.74 | 5.62 | 9.08 | 9.62 | 5.07 | 8.65 | 9.22 |
| Wood and Furnishings | 5.45 | 8.88 | 9.37 | 5.40 | 8.73 | 9.25 | 4.87 | 8.31 | 8.87 |
| Printing and Other Industries | 5.90 | 9.64 | 10.17 | 5.85 | 9.47 | 10.00 | 5.29 | 9.02 | 9.63 |
| Construction | 4.92 | 8.03 | 8.49 | 4.88 | 7.89 | 8.38 | 4.40 | 7.51 | 8.03 |
| Transportation | 3.67 | 6.05 | 6.49 | 3.64 | 5.95 | 6.40 | 3.29 | 5.66 | 6.12 |
| Commerce | 5.28 | 8.62 | 9.09 | 5.24 | 8.47 | 8.98 | 4.73 | 8.06 | 8.60 |
| Other Services | 4.31 | 7.04 | 7.44 | 4.27 | 6.92 | 7.34 | 3.85 | 6.58 | 7.04 |
| Average | 4.82 | 7.88 | 8.35 | 4.79 | 7.75 | 8.24 | 4.31 | 7.37 | 7.90 |
| Standard Deviation | .77 | 1.24 | 1.27 | .77 | 1.22 | 1.25 | .69 | 1.16 | 1.21 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.16.--Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = .65$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|-------|-------|--|------|-------|---|------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.97 | 8.20 | 8.80 | 4.93 | 8.06 | 8.68 | 4.45 | 7.66 | 8.30 |
| Food, Beverages and Tobacco | 4.73 | 7.77 | 8.28 | 4.69 | 7.63 | 8.17 | 4.23 | 7.26 | 6.04 |
| Construction Materials and Ceramics | 4.51 | 7.41 | 7.91 | 4.47 | 7.28 | 7.80 | 4.03 | 6.93 | 7.46 |
| Mechanical and Electrical Industries | 5.60 | 9.19 | 9.78 | 5.55 | 9.03 | 9.65 | 5.01 | 8.59 | 9.24 |
| Chemical Industries | 4.62 | 7.61 | 8.16 | 4.58 | 7.48 | 8.00 | 4.13 | 7.11 | 7.69 |
| Textile, Clothing and Leather | 5.37 | 8.81 | 9.37 | 5.33 | 8.66 | 9.24 | 4.81 | 8.24 | 8.85 |
| Wood and Furnishings | 6.15 | 10.05 | 10.62 | 6.10 | 9.88 | 10.48 | 5.51 | 9.40 | 10.05 |
| Printing and Other Industries | 5.65 | 9.28 | 9.89 | 5.61 | 9.12 | 9.76 | 5.06 | 8.68 | 9.34 |
| Construction | 3.10 | 5.19 | 5.69 | 3.08 | 5.10 | 5.61 | 2.78 | 4.85 | 5.34 |
| Transportation | 3.42 | 5.69 | 6.20 | 3.39 | 5.59 | 6.11 | 3.04 | 5.32 | 5.82 |
| Commerce | 4.73 | 7.78 | 8.32 | 4.69 | 7.65 | 8.21 | 4.23 | 7.28 | 7.85 |
| Other Services | 3.66 | 6.04 | 6.49 | 3.63 | 5.93 | 6.40 | 3.27 | 5.64 | 6.11 |
| Average | 4.70 | 7.75 | 8.29 | 4.67 | 7.60 | 8.17 | 4.21 | 7.24 | 7.67 |
| Standard Deviation | .93 | 1.50 | 1.54 | .93 | 1.49 | 1.52 | .84 | 1.40 | 1.55 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.17.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 11.50$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|------|--|------|------|------|---|---|---|----|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 3.51 | 5.69 | 5.98 | 3.49 | 5.59 | 5.90 | 3.42 | 5.34 | 4.93 | | | |
| Food, Beverage and Tobacco | 3.39 | 5.49 | 5.76 | 3.37 | 5.40 | 5.69 | 3.30 | 5.15 | 4.75 | | | |
| Construction Materials and Ceramics | 3.34 | 5.40 | 5.67 | 3.32 | 5.31 | 5.60 | 3.26 | 5.07 | 4.67 | | | |
| Mechanical and Electrical Industries | 3.88 | 6.26 | 6.55 | 3.86 | 6.16 | 6.47 | 3.78 | 5.89 | 5.40 | | | |
| Chemical Industries | 3.52 | 5.67 | 5.93 | 3.49 | 5.58 | 5.83 | 3.43 | 5.33 | 4.90 | | | |
| Textile, Clothing and Leather | 3.45 | 5.58 | 5.86 | 3.43 | 5.49 | 5.78 | 3.37 | 5.24 | 4.83 | | | |
| Wood and Furnishings | 3.99 | 6.42 | 6.69 | 3.96 | 6.32 | 6.60 | 3.89 | 6.00 | 5.53 | | | |
| Printing and Other Industries | 3.82 | 6.17 | 6.46 | 3.79 | 6.06 | 6.39 | 3.72 | 5.79 | 5.33 | | | |
| Construction | 3.69 | 5.95 | 6.22 | 3.66 | 5.86 | 6.12 | 3.60 | 5.59 | 5.13 | | | |
| Transportation | 3.37 | 5.45 | 5.72 | 3.34 | 5.36 | 5.64 | 3.29 | 5.12 | 4.72 | | | |
| Commerce | 3.50 | 5.65 | 5.93 | 3.47 | 5.56 | 5.89 | 3.41 | 5.31 | 4.89 | | | |
| Other Services | 3.24 | 5.21 | 5.46 | 3.21 | 5.13 | 5.38 | 3.15 | 4.90 | 4.50 | | | |
| Average | 3.55 | 5.74 | 6.01 | 3.53 | 5.65 | 5.94 | 3.46 | 5.39 | 4.96 | | | |
| Standard Deviation | .23 | .37 | .38 | .23 | .36 | .37 | .22 | .34 | .31 | | | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.18.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 11.50$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.28 | 6.92 | 7.25 | 4.25 | 6.81 | 7.16 | 4.17 | 6.50 | 5.98 |
| Food, Beverages and Tobacco | 3.71 | 6.02 | 6.35 | 3.69 | 5.93 | 6.27 | 3.62 | 5.66 | 5.23 |
| Construction Materials and Ceramics | 4.28 | 6.89 | 7.20 | 4.25 | 6.78 | 7.12 | 4.17 | 6.48 | 5.95 |
| Mechanical and Electrical Industries | 4.14 | 6.69 | 7.02 | 4.11 | 6.59 | 6.94 | 4.00 | 6.29 | 5.79 |
| Chemical Industries | 3.94 | 6.38 | 6.71 | 3.11 | 6.28 | 6.64 | 3.80 | 5.99 | 5.53 |
| Textile, Clothing and Leather | 4.08 | 6.60 | 6.95 | 4.05 | 6.50 | 6.87 | 3.98 | 6.20 | 5.73 |
| Wood and Furnishings | 4.92 | 7.92 | 8.25 | 4.89 | 7.79 | 8.16 | 4.83 | 7.44 | 6.81 |
| Printing and Other Industries | 5.16 | 8.14 | 8.68 | 5.13 | 8.18 | 8.59 | 5.03 | 7.82 | 7.17 |
| Construction | 3.59 | 5.82 | 6.15 | 3.56 | 5.73 | 6.07 | 3.50 | 5.47 | 5.06 |
| Transportation | 3.92 | 6.35 | 6.67 | 3.89 | 6.25 | 6.58 | 3.82 | 5.96 | 5.50 |
| Commerce | 4.19 | 6.76 | 7.10 | 4.16 | 6.66 | 7.01 | 4.08 | 6.36 | 5.86 |
| Other Services | 3.65 | 5.90 | 6.19 | 3.62 | 5.80 | 5.10 | 3.56 | 5.54 | 5.10 |
| Average | 4.15 | 6.70 | 7.04 | 4.05 | 6.60 | 6.95 | 4.00 | 6.30 | 5.80 |
| Standard Deviation | .47 | .72 | .76 | .55 | .74 | .76 | .47 | .71 | .63 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.19.--Private Benefit-Cost Ratios, Case: Skilled Workers. $X = 11.50$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 2.85 | 4.72 | 5.13 | 2.83 | 4.64 | 5.05 | 2.78 | 4.42 | 4.15 |
| Food, Beverages and Tobacco | 4.41 | 7.14 | 7.50 | 4.38 | 7.02 | 7.42 | 4.30 | 6.71 | 6.19 |
| Construction Materials and Ceramics | 2.43 | 4.04 | 4.40 | 2.42 | 3.97 | 4.33 | 2.37 | 3.79 | 3.59 |
| Mechanical and Electrical Industries | 4.90 | 7.93 | 8.32 | 4.87 | 7.81 | 8.23 | 4.78 | 7.45 | 6.86 |
| Chemical Industries | 3.72 | 6.07 | 6.45 | 3.69 | 5.97 | 6.36 | 3.63 | 5.70 | 5.30 |
| Textile, Clothing and Leather | 5.13 | 8.28 | 8.69 | 5.09 | 8.15 | 8.60 | 5.00 | 7.78 | 7.16 |
| Wood and Furnishings | 4.92 | 7.95 | 8.34 | 4.89 | 7.82 | 8.24 | 4.79 | 7.47 | 6.87 |
| Printing and Other Industries | 5.28 | 8.53 | 8.96 | 5.24 | 8.39 | 8.88 | 5.14 | 8.02 | 7.39 |
| Construction | 4.28 | 6.91 | 7.29 | 4.25 | 5.76 | 7.21 | 4.15 | 6.49 | 6.00 |
| Transportation | 2.48 | 4.11 | 4.49 | 2.46 | 4.04 | 4.41 | 2.41 | 3.85 | 3.67 |
| Commerce | 4.73 | 7.65 | 8.03 | 4.70 | 7.53 | 7.96 | 4.61 | 7.19 | 6.62 |
| Other Services | 3.76 | 6.08 | 6.41 | 3.73 | 5.99 | 6.34 | 3.66 | 5.72 | 5.28 |
| Average | 4.07 | 6.61 | 7.00 | 4.04 | 6.42 | 6.91 | 3.96 | 6.21 | 5.75 |
| Standard Deviation | 1.02 | 1.61 | 1.61 | 1.01 | 1.59 | 1.61 | .99 | 1.21 | 1.35 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.20.--Private Benefit-Cost Ratios, Case: Technicians. $X = 11.50$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 3.22 | 5.37 | 5.89 | 3.20 | 5.28 | 5.81 | 3.14 | 5.03 | 4.81 |
| Food, Beverages and Tobacco | 3.60 | 5.90 | 6.33 | 3.57 | 5.81 | 6.24 | 3.51 | 5.54 | 5.19 |
| Construction Materials and Ceramics | 3.34 | 5.49 | 5.91 | 3.32 | 5.40 | 5.83 | 3.25 | 5.15 | 4.84 |
| Mechanical and Electrical Industries | 4.31 | 7.06 | 7.56 | 4.28 | 6.95 | 7.48 | 4.20 | 6.63 | 6.21 |
| Chemical Industries | 3.13 | 5.19 | 5.66 | 3.11 | 5.10 | 5.59 | 3.05 | 4.86 | 4.62 |
| Textile, Clothing and Leather | 4.27 | 6.97 | 7.43 | 4.24 | 6.85 | 7.35 | 4.16 | 6.54 | 6.10 |
| Wood and Furnishings | 5.37 | 8.70 | 9.16 | 5.33 | 8.55 | 9.06 | 5.23 | 8.17 | 7.55 |
| Printing and Other Industries | 4.27 | 7.00 | 7.51 | 4.23 | 6.88 | 7.43 | 4.16 | 6.56 | 6.16 |
| Construction | 1.08 | 1.97 | 2.42 | 1.06 | 1.93 | 2.35 | 1.01 | 1.83 | 1.72 |
| Transportation | 1.52 | 2.66 | 3.12 | 1.50 | 2.61 | 3.05 | 1.42 | 2.48 | 2.41 |
| Commerce | 3.39 | 5.60 | 6.06 | 3.37 | 5.50 | 5.99 | 3.30 | 5.25 | 4.95 |
| Other Services | 2.35 | 3.93 | 4.32 | 2.33 | 3.86 | 4.25 | 2.29 | 3.68 | 3.52 |
| Average | 3.32 | 5.48 | 5.94 | 3.29 | 5.39 | 5.86 | 3.22 | 5.14 | 4.84 |
| Standard Deviation | 1.21 | 1.91 | 1.92 | 1.21 | 1.88 | 1.92 | 1.20 | 1.80 | 1.65 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.21.--Private Benefit-Cost Ratios, Case: Unskilled Workers. $X = 12.65$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 3.19 | 5.24 | 5.59 | 3.16 | 5.15 | 5.52 | 2.85 | 4.90 | 5.28 |
| Food, Beverages and Tobacco | 3.08 | 5.07 | 5.40 | 3.06 | 4.98 | 5.33 | 2.76 | 4.74 | 5.10 |
| Construction Materials and Ceramics | 3.05 | 5.01 | 5.33 | 3.03 | 4.92 | 5.26 | 2.73 | 4.68 | 5.04 |
| Mechanical and Electrical Industries | 3.58 | 5.87 | 6.22 | 3.56 | 5.77 | 6.14 | 3.21 | 5.49 | 5.88 |
| Chemical Industries | 3.24 | 5.30 | 5.63 | 3.21 | 5.21 | 5.55 | 2.90 | 4.96 | 5.32 |
| Textile, Clothing and Leather | 3.14 | 5.16 | 5.50 | 3.12 | 5.07 | 5.42 | 2.82 | 4.83 | 5.19 |
| Wood and Furnishings | 3.72 | 6.07 | 6.42 | 3.69 | 5.97 | 6.34 | 3.33 | 5.68 | 6.07 |
| Printing and Other Industries | 3.50 | 5.74 | 6.10 | 3.47 | 5.64 | 6.02 | 3.18 | 5.37 | 5.76 |
| Construction | 3.42 | 5.60 | 5.93 | 3.40 | 5.51 | 5.85 | 3.07 | 5.24 | 5.61 |
| Transportation | 3.07 | 5.05 | 5.38 | 3.05 | 4.96 | 5.31 | 2.75 | 4.72 | 5.08 |
| Commerce | 3.19 | 5.24 | 5.58 | 3.17 | 5.15 | 5.51 | 2.86 | 4.90 | 5.27 |
| Other Services | 2.97 | 4.87 | 5.17 | 2.95 | 4.78 | 5.09 | 2.66 | 4.55 | 4.88 |
| Average | 3.26 | 5.35 | 5.68 | 3.23 | 5.25 | 5.61 | 2.92 | 5.00 | 5.37 |
| Standard Deviation | .23 | .37 | .39 | .23 | .37 | .38 | .21 | .35 | .37 |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.22.--Private Benefit-Cost Ratios, Case: Semi-Skilled Workers. $X = 12.65$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|--|--|------|------|--|---|------|------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 3.94 | 6.44 | 6.85 | | 3.90 | 6.33 | 6.76 | | 3.52 | 6.03 | 6.47 | |
| Food, Beverages and Tobacco | 3.30 | 5.50 | 5.89 | | 3.31 | 5.41 | 5.81 | | 2.99 | 5.14 | 5.56 | |
| Construction Materials and Ceramics | 3.95 | 6.47 | 6.86 | | 3.92 | 6.36 | 6.77 | | 3.54 | 6.06 | 6.48 | |
| Mechanical and Electrical Industries | 3.78 | 6.21 | 6.61 | | 3.75 | 6.10 | 6.54 | | 3.39 | 5.81 | 6.24 | |
| Chemical Industries | 3.56 | 5.86 | 6.26 | | 3.53 | 5.76 | 6.16 | | 3.19 | 5.48 | 5.91 | |
| Textile, Clothing and Leather | 3.69 | 6.07 | 6.48 | | 3.66 | 5.96 | 6.40 | | 3.30 | 5.67 | 6.12 | |
| Wood and Furnishings | 4.60 | 7.50 | 7.92 | | 4.65 | 7.38 | 7.81 | | 4.12 | 7.02 | 7.50 | |
| Printing and Other Industries | 4.78 | 7.28 | 8.28 | | 4.75 | 7.69 | 8.18 | | 4.28 | 7.32 | 7.83 | |
| Construction | 3.21 | 5.30 | 5.68 | | 3.18 | 5.20 | 5.61 | | 2.87 | 4.95 | 5.36 | |
| Transportation | 3.56 | 5.86 | 6.25 | | 3.54 | 5.75 | 6.18 | | 3.19 | 5.48 | 5.90 | |
| Commerce | 3.83 | 6.28 | 6.69 | | 3.80 | 6.18 | 6.61 | | 3.43 | 5.88 | 6.32 | |
| Other Services | 3.33 | 5.47 | 5.82 | | 3.31 | 5.37 | 5.75 | | 2.98 | 5.11 | 5.50 | |
| Average | 3.79 | 6.18 | 6.63 | | 3.77 | 6.12 | 6.54 | | 3.40 | 5.82 | 6.26 | |
| Standard Deviation | .48 | .67 | .79 | | .49 | .66 | .78 | | .43 | .72 | .75 | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.23.--Private Benefit-Cost Ratios, Case: Skilled Workers. $x = 12.65$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | Discount Rate of 6% and Length of Stay (Years) | | | Discount Rate of 12% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|--|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 2.30 | 3.90 | 4.35 | 2.28 | 3.83 | 4.28 | 2.06 | 3.64 | 4.06 |
| Food, Beverages and Tobacco | 4.00 | 6.58 | 7.02 | 3.97 | 6.47 | 6.93 | 3.58 | 6.15 | 6.63 |
| Construction Materials and Ceramics | 1.94 | 3.30 | 3.70 | 1.92 | 3.24 | 3.64 | 1.74 | 3.07 | 3.45 |
| Mechanical and Electrical Industries | 4.48 | 7.35 | 7.82 | 4.44 | 7.22 | 7.72 | 4.01 | 6.87 | 7.39 |
| Chemical Industries | 3.25 | 5.39 | 5.84 | 3.22 | 5.30 | 5.76 | 2.91 | 5.00 | 5.49 |
| Textile, Clothing and Leather | 4.69 | 7.70 | 8.19 | 4.65 | 7.57 | 8.08 | 4.20 | 7.20 | 7.73 |
| Wood and Furnishings | 4.50 | 7.38 | 7.85 | 4.46 | 7.25 | 7.74 | 4.02 | 6.90 | 7.42 |
| Printing and Other Industries | 4.80 | 7.88 | 8.41 | 4.76 | 7.75 | 8.30 | 4.30 | 7.37 | 7.94 |
| Construction | 3.83 | 6.14 | 6.76 | 3.80 | 6.01 | 6.67 | 3.43 | 5.90 | 6.38 |
| Transportation | 1.96 | 3.34 | 3.75 | 1.94 | 3.28 | 3.68 | 1.76 | 3.11 | 3.50 |
| Commerce | 4.31 | 7.08 | 7.54 | 4.28 | 6.96 | 7.48 | 3.86 | 6.62 | 7.12 |
| Other Services | 3.38 | 5.57 | 5.97 | 3.36 | 5.48 | 5.89 | 3.03 | 5.21 | 5.62 |
| Average | 3.62 | 5.96 | 6.43 | 3.59 | 5.86 | 6.34 | 3.24 | 5.58 | 6.10 |
| Standard Deviation | 1.05 | 1.67 | 1.71 | 1.04 | 1.65 | 1.69 | .94 | 1.57 | 1.70 |

Note: E_0 is the probability of employment in the sending country.

x is the exchange rate.

TABLE A5.24.--Private Benefit-Cost Ratios, Case: Technicians. $X = 12.65$; $E_0 = 1$.

| Sectors | Discount Rate of 4% and Length of Stay (Years) | | | | Discount Rate of 6% and Length of Stay (Years) | | | | Discount Rate of 12% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|--|--|------|------|--|---|------|------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 2.49 | 4.27 | 4.84 | | 2.47 | 4.19 | 4.76 | | 2.23 | 3.97 | 4.51 | |
| Food, Beverages and Tobacco | 3.05 | 5.09 | 5.58 | | 3.02 | 5.00 | 5.50 | | 2.72 | 4.76 | 5.24 | |
| Construction Materials and Ceramics | 2.79 | 4.68 | 5.15 | | 2.76 | 4.60 | 5.08 | | 2.49 | 4.37 | 4.83 | |
| Mechanical and Electrical Industries | 3.67 | 6.14 | 6.71 | | 3.64 | 6.03 | 6.64 | | 3.29 | 5.73 | 6.29 | |
| Chemical Industries | 2.48 | 4.23 | 4.92 | | 2.46 | 4.15 | 6.84 | | 2.22 | 3.94 | 4.43 | |
| Textile, Clothing and Leather | 3.69 | 6.14 | 6.67 | | 3.66 | 6.03 | 6.59 | | 3.30 | 5.73 | 6.27 | |
| Wood and Furnishings | 4.84 | 7.97 | 8.53 | | 4.80 | 7.83 | 8.42 | | 4.33 | 7.45 | 8.05 | |
| Printing and Other Industries | 3.60 | 6.02 | 6.61 | | 3.57 | 5.91 | 6.53 | | 3.22 | 5.62 | 6.12 | |
| Construction | 0.36 | 0.99 | 1.31 | | 0.35 | 0.83 | 1.26 | | 0.32 | 0.77 | 1.15 | |
| Transportation | 0.83 | 1.84 | 2.06 | | 0.80 | 1.55 | 2.01 | | 0.74 | 1.46 | 1.86 | |
| Commerce | 2.78 | 4.70 | 5.21 | | 2.76 | 4.61 | 5.14 | | 2.49 | 4.38 | 4.87 | |
| Other Services | 1.81 | 3.11 | 3.54 | | 1.79 | 3.05 | 3.48 | | 1.62 | 2.89 | 3.29 | |
| Average | 2.73 | 4.59 | 5.09 | | 2.67 | 4.48 | 5.18 | | 2.41 | 4.25 | 4.74 | |
| Standard Deviation | 1.27 | 1.94 | 2.03 | | 1.24 | 1.96 | 2.08 | | 1.12 | 1.87 | 1.93 | |

Note: E_0 is the probability of employment in the sending country.

X is the exchange rate.

TABLE A5.25.---Social Benefit-Cost Ratios, Case: Married Unskilled Workers. Not Receiving Any Form of Transfer Payments.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 18.99 | 19.40 | 17.20 | 18.29 | 19.37 | 17.53 | 18.98 | 19.33 | 18.05 |
| Food, Beverages and Tobacco | 19.50 | 19.92 | 17.67 | 19.50 | 19.89 | 18.00 | 19.49 | 19.84 | 18.53 |
| Construction Materials and Ceramics | 20.31 | 20.75 | 18.40 | 20.31 | 20.72 | 18.75 | 20.30 | 20.67 | 19.30 |
| Mechanical and Electrical Industries | 23.81 | 24.32 | 21.57 | 23.80 | 24.29 | 21.98 | 23.80 | 24.23 | 22.62 |
| Chemical Industries | 23.00 | 23.49 | 20.83 | 22.99 | 23.46 | 21.23 | 22.99 | 23.40 | 21.85 |
| Textile, Clothing and Leather | 19.72 | 20.15 | 17.87 | 19.72 | 20.12 | 18.21 | 19.71 | 20.07 | 18.74 |
| Wood and Furnishings | 29.27 | 29.90 | 26.52 | 29.26 | 29.86 | 27.02 | 29.25 | 29.78 | 27.81 |
| Printing and Other Industries | 21.64 | 22.11 | 16.06 | 21.63 | 22.08 | 19.97 | 21.63 | 22.02 | 20.56 |
| Construction | 26.00 | 26.56 | 23.56 | 26.00 | 26.53 | 24.00 | 25.99 | 26.46 | 24.71 |
| Transportation | 19.91 | 20.34 | 18.04 | 19.91 | 20.31 | 18.38 | 19.90 | 20.26 | 18.92 |
| Commerce | 20.39 | 20.84 | 18.57 | 20.39 | 20.81 | 18.83 | 20.39 | 20.75 | 19.38 |
| Other Services | 22.34 | 22.82 | 20.24 | 22.34 | 22.79 | 20.62 | 22.33 | 22.74 | 21.23 |
| Average | 22.07 | 22.55 | 19.62 | 22.01 | 22.51 | 20.37 | 22.06 | 22.46 | 20.97 |
| Standard Deviation | 3.06 | 3.13 | 2.96 | 3.13 | 3.13 | 2.83 | 3.07 | 3.12 | 2.91 |

TABLE A5.26.---Social Benefit-Cost Ratios, Case: Married Semi-Skilled Workers. Educational Costs not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 21.66 | 22.13 | 19.62 | 21.66 | 22.10 | 20.00 | 21.65 | 22.04 | 20.58 |
| Food, Beverages and Tobacco | 17.24 | 17.61 | 15.62 | 17.23 | 17.59 | 15.91 | 17.23 | 17.54 | 16.38 |
| Construction Materials and Ceramics | 24.81 | 25.34 | 22.47 | 24.80 | 25.31 | 22.90 | 24.79 | 25.24 | 23.57 |
| Mechanical and Electrical Industries | 20.34 | 20.78 | 18.43 | 20.34 | 20.75 | 18.78 | 20.33 | 20.70 | 19.33 |
| Chemical Industries | 18.18 | 18.58 | 16.47 | 18.18 | 18.55 | 16.79 | 18.17 | 23.40 | 17.28 |
| Textile, Clothing and Leather | 18.26 | 18.65 | 16.54 | 18.25 | 18.63 | 16.85 | 18.25 | 18.58 | 17.35 |
| Wood and Furnishings | 30.55 | 31.21 | 27.68 | 30.55 | 31.17 | 28.21 | 30.54 | 31.09 | 29.03 |
| Printing and Other Industries | 26.12 | 26.68 | 23.66 | 26.11 | 26.64 | 24.11 | 26.10 | 26.58 | 24.82 |
| Construction | 16.61 | 16.97 | 15.05 | 16.61 | 16.94 | 15.33 | 16.60 | 16.90 | 15.78 |
| Transportation | 19.20 | 19.61 | 17.39 | 19.20 | 19.59 | 17.13 | 19.19 | 19.54 | 18.24 |
| Commerce | 20.50 | 20.94 | 18.57 | 20.50 | 20.92 | 18.93 | 20.49 | 20.86 | 19.48 |
| Other Services | 20.59 | 20.72 | 28.38 | 20.28 | 20.70 | 18.73 | 20.28 | 20.65 | 19.28 |
| Average | 21.14 | 21.60 | 19.99 | 21.14 | 21.57 | 19.47 | 21.13 | 21.92 | 20.09 |
| Standard Deviation | 4.10 | 4.19 | 4.55 | 4.10 | 4.18 | 3.82 | 4.10 | 4.12 | 3.62 |

TABLE A5.27.--Social Benefit-Cost Ratios, Case: Married Skilled Workers. Educational Costs not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 11.04 | 11.28 | 10.00 | 11.04 | 11.26 | 10.19 | 11.03 | 11.23 | 10.49 |
| Food, Beverages and Tobacco | 18.88 | 19.29 | 17.11 | 18.88 | 19.27 | 17.43 | 18.87 | 19.22 | 17.94 |
| Construction Materials and Ceramics | 10.78 | 11.01 | 9.76 | 10.77 | 10.99 | 9.95 | 10.77 | 10.97 | 10.24 |
| Mechanical and Electrical Industries | 20.26 | 20.70 | 18.35 | 20.26 | 20.67 | 18.70 | 20.25 | 20.62 | 19.25 |
| Chemical Industries | 14.19 | 14.49 | 12.85 | 14.18 | 14.47 | 13.09 | 14.18 | 14.44 | 13.48 |
| Textile, Clothing and Leather | 20.84 | 21.29 | 18.88 | 20.84 | 21.26 | 19.24 | 20.83 | 21.21 | 19.81 |
| Wood and Furnishings | 20.62 | 21.06 | 18.68 | 20.62 | 21.04 | 19.08 | 20.61 | 20.98 | 19.59 |
| Printing and Other Industries | 19.51 | 19.93 | 17.67 | 19.50 | 19.90 | 18.01 | 19.50 | 19.85 | 18.54 |
| Construction | 17.30 | 17.68 | 15.68 | 17.30 | 17.65 | 15.97 | 17.29 | 17.61 | 16.44 |
| Transportation | 10.66 | 10.89 | 9.66 | 10.66 | 10.87 | 9.84 | 10.65 | 10.85 | 10.13 |
| Commerce | 19.78 | 20.21 | 17.92 | 19.78 | 20.18 | 18.26 | 19.77 | 20.13 | 18.80 |
| Other Services | 17.63 | 18.01 | 15.97 | 17.63 | 17.99 | 16.28 | 17.62 | 17.94 | 16.75 |
| Average | 16.79 | 17.15 | 15.21 | 16.78 | 17.12 | 15.50 | 16.78 | 17.08 | 15.95 |
| Standard Deviation | 4.02 | 4.11 | 3.64 | 4.02 | 4.11 | 3.72 | 4.02 | 4.09 | 3.82 |

TABLE A5.28.--Social Benefit-Cost Ratios, Case: Married Technicians. Educational Costs not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 10.26 | 10.48 | 9.30 | 10.26 | 10.47 | 9.47 | 10.26 | 10.44 | 9.75 |
| Food, Beverages and Tobacco | 12.48 | 12.75 | 11.31 | 12.48 | 12.74 | 11.52 | 12.48 | 12.70 | 11.86 |
| Construction Materials and Ceramics | 11.97 | 12.22 | 10.84 | 11.96 | 12.21 | 11.05 | 11.96 | 12.18 | 11.37 |
| Mechanical and Electrical Industries | 12.77 | 13.04 | 11.57 | 12.77 | 13.03 | 11.79 | 12.76 | 12.99 | 12.13 |
| Chemical Industries | 10.71 | 10.94 | 9.70 | 10.71 | 10.92 | 9.88 | 10.70 | 10.90 | 10.17 |
| Textile, Clothing and Leather | 13.53 | 13.82 | 12.26 | 13.53 | 13.80 | 12.49 | 13.52 | 13.77 | 12.86 |
| Wood and Furnishings | 17.73 | 18.11 | 16.06 | 17.73 | 18.09 | 16.37 | 17.72 | 18.04 | 16.85 |
| Printing and Other Industries | 12.32 | 12.59 | 11.16 | 12.32 | 12.57 | 11.38 | 12.32 | 12.54 | 11.71 |
| Construction | 7.85 | 8.02 | 7.11 | 7.85 | 8.01 | 7.25 | 7.85 | 7.99 | 7.46 |
| Transportation | 8.37 | 8.56 | 7.58 | 8.37 | 8.54 | 7.72 | 8.36 | 8.52 | 7.95 |
| Commerce | 11.44 | 11.68 | 10.36 | 11.43 | 11.67 | 10.56 | 11.43 | 11.64 | 10.87 |
| Other Services | 10.20 | 10.42 | 9.24 | 10.19 | 10.40 | 9.41 | 10.19 | 10.38 | 9.69 |
| Average | 11.63 | 11.88 | 10.54 | 11.63 | 11.87 | 10.74 | 11.62 | 11.84 | 11.05 |
| Standard Deviation | 2.57 | 2.63 | 2.33 | 2.58 | 2.63 | 2.38 | 2.58 | 2.62 | 2.45 |

TABLE A5.29.--Social Benefit-Cost Ratios, Case: Bachelor Unskilled Workers. Not Receiving Any Form of Transfer Payments.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | | Discount Rate of 10% and Length of Stay (Years) | | | | Discount Rate of 20% and Length of Stay (Years) | | | |
|--|--|-------|-------|--|---|-------|-------|--|---|-------|-------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | 8.63 | 8.82 | 7.82 | | 8.63 | 8.80 | 7.97 | | 8.62 | 8.78 | 8.20 | |
| Food, Beverages and Tobacco | 8.66 | 9.05 | 8.03 | | 8.86 | 9.04 | 8.18 | | 8.86 | 9.02 | 8.42 | |
| Construction Materials and Ceramics | 9.23 | 9.43 | 8.36 | | 9.23 | 9.42 | 8.52 | | 9.23 | 9.39 | 8.77 | |
| Mechanical and Eletrical Industries | 10.82 | 11.05 | 9.80 | | 10.82 | 11.04 | 9.99 | | 10.82 | 11.01 | 10.28 | |
| Chemical Industries | 10.45 | 10.68 | 9.47 | | 10.45 | 10.66 | 9.65 | | 10.45 | 10.63 | 9.93 | |
| Textile, Clothing and Leather | 8.96 | 9.16 | 8.12 | | 8.96 | 9.14 | 8.27 | | 8.96 | 9.12 | 8.52 | |
| Wood and Furnishings | 13.30 | 13.59 | 12.05 | | 13.30 | 13.57 | 12.28 | | 13.30 | 13.54 | 12.64 | |
| Printing and Other Industries | 9.83 | 10.05 | 8.91 | | 9.83 | 10.03 | 9.08 | | 9.83 | 10.01 | 9.34 | |
| Construction | 11.82 | 12.07 | 10.71 | | 11.81 | 12.05 | 10.91 | | 11.81 | 12.02 | 11.23 | |
| Transportation | 9.05 | 9.24 | 8.20 | | 9.05 | 9.23 | 8.35 | | 9.05 | 9.21 | 8.60 | |
| Commerce | 9.27 | 9.47 | 8.40 | | 9.27 | 9.45 | 8.55 | | 9.26 | 9.43 | 8.81 | |
| Other Services | 10.15 | 10.37 | 9.20 | | 10.15 | 10.36 | 9.37 | | 10.15 | 10.33 | 9.05 | |
| Average | 10.01 | 10.24 | 9.08 | | 10.03 | 10.23 | 9.26 | | 10.02 | 10.37 | 9.48 | |
| Standard Deviation | 1.41 | 1.42 | 1.26 | | 1.39 | 1.42 | 1.28 | | 1.39 | 1.48 | 1.33 | |

TABLE A5.30.--Social Benefit-Cost Ratios, Case: Bachelor Semi-Skilled Workers. Educational Cost not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | | Discount Rate of 10% and Length of Stay (Years) | | | | Discount Rate of 20% and Length of Stay (Years) | | | |
|---|--|-------|-------|-------|---|-------|-------|-------|---|-------|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 9.84 | 10.06 | 8.92 | 9.84 | 10.04 | 9.09 | 9.84 | 10.02 | 9.35 | 9.84 | 10.02 | 9.35 |
| Food, Beverages and Tobacco | 7.83 | 8.00 | 7.10 | 7.83 | 7.99 | 7.23 | 7.83 | 7.97 | 7.44 | 7.83 | 7.97 | 7.44 |
| Construction Materials and Ceramics | 11.27 | 11.52 | 10.21 | 11.27 | 11.50 | 10.41 | 11.27 | 11.47 | 10.71 | 11.27 | 11.47 | 10.71 |
| Mechanical and Electrical Industries | 9.24 | 9.44 | 8.37 | 9.24 | 9.43 | 8.53 | 9.24 | 9.41 | 8.78 | 9.24 | 9.41 | 8.78 |
| Chemical Industries | 8.26 | 8.44 | 7.49 | 8.26 | 8.43 | 7.63 | 8.26 | 8.41 | 7.85 | 8.26 | 8.41 | 7.85 |
| Textile, Clothing and Leather | 8.30 | 8.48 | 7.52 | 8.29 | 8.46 | 7.66 | 8.29 | 8.44 | 7.88 | 8.29 | 8.44 | 7.88 |
| Wood and Furnishings | 13.89 | 14.19 | 12.59 | 13.88 | 14.17 | 12.82 | 13.88 | 14.13 | 13.19 | 13.88 | 14.13 | 13.19 |
| Printing and Other Industries | 11.87 | 12.12 | 10.75 | 11.87 | 12.11 | 10.96 | 11.86 | 12.08 | 11.28 | 11.86 | 12.08 | 11.28 |
| Construction | 7.55 | 7.71 | 6.84 | 7.55 | 7.70 | 6.97 | 7.54 | 7.68 | 7.17 | 7.54 | 7.68 | 7.17 |
| Transportation | 8.72 | 8.91 | 7.90 | 8.72 | 8.90 | 8.05 | 8.72 | 8.88 | 8.29 | 8.72 | 8.88 | 8.29 |
| Commerce | 9.32 | 9.52 | 8.44 | 9.31 | 9.50 | 8.60 | 9.31 | 9.48 | 8.85 | 9.31 | 9.48 | 8.85 |
| Other Services | 9.22 | 9.42 | 8.35 | 9.22 | 9.40 | 8.51 | 9.21 | 9.38 | 8.76 | 9.21 | 9.38 | 8.76 |
| Average | 9.61 | 9.81 | 8.70 | 9.61 | 9.80 | 8.87 | 9.60 | 9.77 | 9.12 | 9.60 | 9.77 | 9.12 |
| Standard Deviation | 1.86 | 1.90 | 1.68 | 1.86 | 1.90 | 1.72 | 1.86 | 1.89 | 1.77 | 1.86 | 1.89 | 1.77 |

TABLE A5.31.--Social Benefit-Cost Ratios, Case: Bachelor Skilled Workers. Educational Costs not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|---|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 5.01 | 5.12 | 4.54 | 5.01 | 5.12 | 4.63 | 5.01 | 5.10 | 4.76 |
| Food, Beverages and Tobacco | 8.58 | 8.77 | 7.77 | 8.58 | 8.75 | 7.92 | 8.58 | 8.73 | 8.15 |
| Construction Materials and Ceramics | 4.90 | 5.00 | 4.43 | 4.89 | 4.99 | 4.52 | 4.89 | 4.97 | 4.65 |
| Mechanical and Electrical Industries | 9.21 | 9.40 | 8.34 | 9.20 | 9.39 | 8.50 | 9.20 | 9.37 | 8.75 |
| Chemical Industries | 6.45 | 6.58 | 5.84 | 6.44 | 6.58 | 5.95 | 6.44 | 6.56 | 6.12 |
| Textile, Clothing and Leather | 9.47 | 9.68 | 8.58 | 9.47 | 9.66 | 8.74 | 9.47 | 9.64 | 9.00 |
| Wood and Furnishings | 9.37 | 9.57 | 8.49 | 9.37 | 9.56 | 8.65 | 9.37 | 9.53 | 8.90 |
| Printing and Other Industries | 8.86 | 9.06 | 8.03 | 8.80 | 9.04 | 8.18 | 8.86 | 9.02 | 8.42 |
| Construction | 7.86 | 8.03 | 7.12 | 7.86 | 8.02 | 7.26 | 7.86 | 8.00 | 7.47 |
| Transportation | 4.84 | 4.95 | 4.39 | 4.84 | 4.94 | 4.47 | 4.84 | 4.93 | 4.60 |
| Commerce | 8.99 | 9.18 | 8.14 | 8.99 | 9.17 | 8.30 | 8.99 | 9.15 | 8.54 |
| Other Services | 8.01 | 8.18 | 7.26 | 8.01 | 8.17 | 7.40 | 8.01 | 8.15 | 7.61 |
| Average | 7.62 | 7.79 | 6.91 | 7.62 | 7.78 | 7.04 | 7.62 | 7.76 | 7.24 |
| Standard Deviation | 1.83 | 1.87 | 1.78 | 1.82 | 1.86 | 1.68 | 1.83 | 1.86 | 1.74 |

TABLE A5.32.--Social Benefit-Cost Ratios, Case: Bachelor Technicians. Educational Costs not Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|---|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 4.66 | 4.70 | 4.22 | 4.66 | 4.70 | 4.30 | 4.66 | 4.74 | 4.43 |
| Food, Beverages and Tobacco | 5.67 | 5.79 | 5.14 | 5.67 | 5.79 | 5.24 | 5.67 | 5.77 | 5.39 |
| Construction Materials and Ceramics | 5.44 | 5.55 | 4.92 | 5.44 | 5.55 | 5.02 | 5.44 | 5.53 | 5.17 |
| Mechanical and Electrical Industries | 5.80 | 5.93 | 5.26 | 5.80 | 5.92 | 5.35 | 5.80 | 5.90 | 5.51 |
| Chemical Industries | 4.86 | 4.97 | 4.41 | 4.86 | 5.96 | 4.49 | 4.86 | 4.95 | 4.62 |
| Textile, Clothing and Leather | 6.15 | 6.28 | 5.57 | 6.15 | 6.27 | 5.67 | 6.15 | 6.26 | 5.84 |
| Wood and Furnishings | 8.06 | 8.23 | 7.30 | 8.05 | 8.22 | 7.44 | 8.05 | 8.20 | 7.66 |
| Printing and Other Industries | 5.60 | 5.72 | 5.07 | 5.60 | 5.71 | 5.17 | 5.60 | 5.70 | 5.32 |
| Construction | 3.57 | 3.64 | 3.23 | 3.57 | 3.64 | 3.29 | 3.57 | 3.63 | 3.39 |
| Transportation | 3.80 | 3.88 | 3.44 | 3.80 | 3.88 | 3.51 | 3.80 | 3.87 | 3.61 |
| Commerce | 5.20 | 5.31 | 4.71 | 5.19 | 5.30 | 4.80 | 5.19 | 5.29 | 4.94 |
| Other Services | 4.63 | 4.73 | 4.20 | 4.63 | 4.73 | 4.28 | 4.63 | 4.71 | 4.40 |
| Average | 5.28 | 5.39 | 4.87 | 5.28 | 5.38 | 4.85 | 5.28 | 5.37 | 4.83 |
| Standard Deviation | 1.18 | 1.20 | 1.06 | 1.17 | 1.19 | 1.07 | 1.17 | 1.19 | 1.04 |

TABLE A5.33.--Social Benefit-Cost Ratios, Case: Married Unskilled Workers. Receiving Transfer Payments.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 25.00 | 24.91 | 22.38 | 24.98 | 24.93 | 22.76 | 25.04 | 24.96 | 23.42 |
| Food, Beverages and Tobacco | 25.94 | 25.87 | 16.59 | 25.89 | 25.89 | 23.65 | 26.05 | 25.93 | 24.35 |
| Construction Materials and Ceramics | 27.28 | 27.20 | 24.44 | 27.29 | 27.20 | 24.86 | 27.33 | 27.25 | 25.59 |
| Mechanical and Electrical Industries | 34.82 | 31.29 | 28.11 | 31.34 | 31.31 | 28.58 | 31.46 | 31.31 | 29.40 |
| Chemical Industries | 29.42 | 30.83 | 27.71 | 30.89 | 30.81 | 28.18 | 31.09 | 30.88 | 29.00 |
| Textile, Clothing and Leather | 32.21 | 26.10 | 27.63 | 26.12 | 26.12 | 23.86 | 26.27 | 26.16 | 24.57 |
| Wood and Furnishings | 25.90 | 38.87 | 34.92 | 39.03 | 38.83 | 35.54 | 39.22 | 38.91 | 36.54 |
| Printing and Other Industries | 28.38 | 28.30 | 25.42 | 28.32 | 28.31 | 25.85 | 28.41 | 28.32 | 26.59 |
| Construction | 34.95 | 34.82 | 31.32 | 34.91 | 34.88 | 31.86 | 35.23 | 34.94 | 32.78 |
| Transportation | 26.57 | 26.53 | 23.83 | 26.59 | 26.54 | 24.25 | 26.69 | 26.56 | 24.95 |
| Commerce | 27.05 | 27.07 | 24.27 | 27.07 | 27.04 | 24.70 | 27.17 | 27.06 | 25.41 |
| Other Services | 30.68 | 30.50 | 27.43 | 30.61 | 30.51 | 27.89 | 30.73 | 30.55 | 28.67 |
| Average | 29.01 | 29.31 | 26.17 | 29.42 | 29.36 | 26.83 | 29.55 | 29.40 | 27.60 |
| Standard Deviation | 3.44 | 4.13 | 4.58 | 4.17 | 4.14 | 3.79 | 4.22 | 4.15 | 3.89 |

TABLE A5.34.--Social Benefit-Cost Ratios, Case: Married Semi-Skilled Workers. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|------|-------|---|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 3.39 | 6.81 | 8.89 | 3.19 | 6.18 | 7.91 | 2.86 | 5.15 | 6.29 |
| Food, Beverages and Tobacco | 3.21 | 6.24 | 7.90 | 3.03 | 5.70 | 7.11 | 2.73 | 4.80 | 5.77 |
| Construction Materials and Ceramics | 3.28 | 6.79 | 9.12 | 3.09 | 6.13 | 8.02 | 2.76 | 5.07 | 6.28 |
| Mechanical and Electrical Industries | 3.44 | 6.60 | 8.62 | 3.15 | 5.98 | 7.69 | 2.82 | 4.90 | 6.16 |
| Chemical Industries | 3.31 | 6.46 | 8.12 | 3.12 | 5.85 | 7.38 | 2.79 | 4.92 | 5.98 |
| Textile, Clothing and Leather | 3.40 | 6.61 | 8.36 | 3.21 | 6.02 | 7.53 | 2.88 | 5.74 | 6.11 |
| Wood and Furnishings | 3.59 | 7.55 | 10.33 | 3.39 | 6.33 | 9.02 | 3.03 | 5.32 | 6.98 |
| Printing and Other Industries | 3.83 | 7.78 | 10.28 | 3.62 | 7.07 | 9.10 | 3.25 | 5.91 | 7.19 |
| Construction | 3.16 | 6.12 | 7.71 | 2.98 | 5.55 | 6.95 | 2.68 | 4.72 | 5.66 |
| Transportation | 3.24 | 6.43 | 8.28 | 3.05 | 5.82 | 7.41 | 2.72 | 4.90 | 5.95 |
| Commerce | 3.27 | 6.71 | 8.69 | 3.18 | 6.10 | 7.75 | 2.85 | 5.10 | 6.21 |
| Other Services | 3.01 | 6.10 | 8.04 | 2.84 | 5.56 | 7.13 | 2.54 | 4.60 | 5.64 |
| Average | 3.34 | 6.68 | 8.69 | 3.15 | 6.02 | 7.75 | 2.82 | 5.09 | 6.18 |
| Standard Deviation | .20 | .51 | .85 | .19 | .40 | .69 | .17 | .39 | .47 |

TABLE A5.35.--Social Benefit-Cost Ratios, Case: Married Skilled Workers. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | | Discount Rate of 10% and Length of Stay (Years) | | | | Discount Rate of 20% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|--|---|------|------|--|---|------|------|--|
| | 2 | 5 | 10 | | 2 | 5 | 10 | | 2 | 5 | 10 | |
| Mining | .99 | 2.12 | 3.49 | | .93 | 1.90 | 3.03 | | .83 | 1.56 | 2.33 | |
| Food, Beverages and Tobacco | 1.02 | 2.32 | 3.86 | | .96 | 2.07 | 3.26 | | .85 | 1.65 | 2.41 | |
| Construction Materials and Ceramics | 1.98 | 2.04 | 3.21 | | .89 | 1.83 | 2.77 | | .79 | 1.49 | 2.11 | |
| Mechanical and Electrical Industries | 1.02 | 2.35 | 4.14 | | .97 | 2.09 | 3.49 | | .86 | 1.68 | 2.58 | |
| Chemical Industries | 1.03 | 2.26 | 3.69 | | .96 | 2.02 | 3.16 | | .85 | 1.64 | 2.37 | |
| Textile, Clothing and Leather | 1.09 | 2.45 | 4.26 | | 1.02 | 2.18 | 3.60 | | .90 | 1.75 | 2.66 | |
| Wood and Furnishings | 1.06 | 2.40 | 4.13 | | .99 | 2.13 | 3.49 | | .88 | 1.71 | 2.57 | |
| Printing and Other Industries | 1.16 | 2.59 | 4.40 | | 1.08 | 2.30 | 3.73 | | .96 | 1.86 | 2.78 | |
| Construction | 1.01 | 2.26 | 3.83 | | .94 | 2.01 | 3.25 | | .84 | 1.86 | 2.42 | |
| Transportation | .97 | 2.08 | 3.27 | | .91 | 1.87 | 2.84 | | .81 | 1.53 | 2.17 | |
| Commerce | 1.05 | 2.37 | 4.04 | | .98 | 1.93 | 2.97 | | .87 | 1.69 | 2.52 | |
| Other Services | .92 | 2.09 | 3.46 | | .86 | 1.85 | 2.92 | | .76 | 1.49 | 2.15 | |
| Average | 1.02 | 2.27 | 3.81 | | .95 | 2.01 | 3.20 | | .85 | 1.65 | 2.42 | |
| Standard Deviation | .06 | .17 | .39 | | .05 | .14 | .31 | | .05 | .12 | .21 | |

TABLE A5.36.--Social Benefit-Cost Ratios, Case: Married Technicians. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | | Discount Rate of 10% and Length of Stay (Years) | | | | Discount Rate of 20% and Length of Stay (Years) | | | |
|--------------------------------------|--|------|------|-----|---|------|-----|------|---|---|---|----|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | .83 | 1.83 | 2.63 | .78 | 1.63 | 2.25 | .69 | 1.32 | 1.69 | | | |
| Food, Beverages and Tobacco | .71 | 1.60 | 2.40 | .66 | 1.42 | 2.02 | .58 | 1.14 | 1.48 | | | |
| Construction Materials and Ceramics | .69 | 1.57 | 2.33 | .64 | 1.39 | 1.97 | .57 | 1.12 | 1.45 | | | |
| Mechanical and Electrical Industries | .75 | 1.68 | 2.46 | .71 | 1.50 | 2.09 | .63 | 1.21 | 1.56 | | | |
| Chemical Industries | .77 | 1.74 | 2.60 | .72 | 1.54 | 2.19 | .63 | 1.24 | 1.61 | | | |
| Textile, Clothing and Leather | .79 | 1.82 | 2.77 | .74 | 1.61 | 2.31 | .65 | 1.29 | 1.68 | | | |
| Wood and Furnishings | .84 | 1.88 | 2.76 | .79 | 1.67 | 2.33 | .70 | 1.35 | 1.74 | | | |
| Printing and Other Industries | .70 | 1.52 | 2.16 | .65 | 1.36 | 1.86 | .58 | 1.11 | 1.40 | | | |
| Construction | .70 | 1.55 | 2.21 | .66 | 1.38 | 1.90 | .59 | 1.12 | 1.43 | | | |
| Transportation | .74 | 1.67 | 2.46 | .69 | 1.42 | 2.08 | .61 | 1.19 | 1.54 | | | |
| Commerce | .63 | 1.42 | 2.10 | .59 | 1.26 | 1.78 | .52 | 1.01 | 1.31 | | | |
| Other Services | | | | | | | | | | | | |
| Average | .74 | 1.67 | 2.46 | .70 | 1.48 | 2.09 | .62 | 1.20 | 1.54 | | | |
| Standard Deviation | .06 | .14 | .23 | .06 | .13 | .19 | .05 | .10 | .13 | | | |

TABLE A5.37.---Social Benefit-Cost Ratios, Case: Bachelor Unskilled. Receiving Transfer Payments.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|---|--|-------|-------|---|-------|-------|---|-------|-------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 14.58 | 14.33 | 15.79 | 14.60 | 14.35 | 16.05 | 14.69 | 14.44 | 16.98 |
| Food, Beverages and Tobacco | 15.30 | 15.00 | 16.47 | 15.32 | 15.03 | 16.78 | 15.41 | 15.10 | 17.29 |
| Construction Materials and Ceramics | 16.19 | 15.87 | 17.48 | 16.20 | 15.72 | 17.81 | 16.34 | 15.97 | 18.32 |
| Mechanical and Electrical Industries | 18.37 | 18.02 | 19.68 | 18.35 | 18.05 | 20.04 | 18.48 | 18.12 | 20.63 |
| Chemical Industries | 18.38 | 18.01 | 19.86 | 18.42 | 18.04 | 20.22 | 18.54 | 18.14 | 20.83 |
| Textile, Clothing and Leather | 15.40 | 15.11 | 16.57 | 15.38 | 15.14 | 16.87 | 15.52 | 15.21 | 17.38 |
| Wood and Furnishings | 23.03 | 22.55 | 24.75 | 23.03 | 22.55 | 25.23 | 23.22 | 22.67 | 25.96 |
| Printing and Other Industries | 15.90 | 16.23 | 17.63 | 16.51 | 16.26 | 18.01 | 16.62 | 16.31 | 18.54 |
| Construction | 20.76 | 20.33 | 22.62 | 20.74 | 20.35 | 22.85 | 21.00 | 20.49 | 23.53 |
| Transportation | 15.71 | 15.43 | 16.96 | 15.72 | 15.44 | 17.28 | 15.84 | 15.51 | 17.79 |
| Commerce | 15.99 | 15.65 | 17.16 | 15.95 | 15.66 | 17.49 | 16.06 | 15.74 | 18.00 |
| Other Services | 18.47 | 18.01 | 20.05 | 18.42 | 18.06 | 20.42 | 18.56 | 18.15 | 21.04 |
| Average | 17.34 | 17.04 | 18.75 | 17.38 | 17.05 | 19.08 | 17.52 | 17.15 | 19.69 |
| Standard Deviation | 2.53 | 2.44 | 2.73 | 2.50 | 2.45 | 2.76 | 2.54 | 2.46 | 2.79 |

TABLE A5.38.--Social Benefit-Cost Ratios, Case: Semi-Skilled Workers. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|---|------|------|---|------|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | 1.54 | 3.09 | 4.04 | 1.45 | 2.81 | 3.59 | 1.30 | 2.34 | 2.86 |
| Food, Beverages and Tobacco | 1.46 | 2.83 | 3.59 | 1.38 | 2.59 | 3.23 | 1.24 | 2.18 | 2.62 |
| Construction Materials and Ceramics | 1.49 | 3.08 | 4.14 | 1.40 | 2.78 | 3.64 | 1.25 | 2.30 | 2.85 |
| Mechanical and Electrical Industries | 1.52 | 3.02 | 3.92 | 1.43 | 2.75 | 3.49 | 1.28 | 2.23 | 2.80 |
| Chemical Industries | 1.505 | 2.93 | 3.69 | 1.42 | 2.68 | 3.53 | 1.30 | 2.23 | 2.72 |
| Textile, Clothing and Leather | 1.54 | 3.00 | 3.80 | 1.46 | 2.74 | 3.46 | 1.32 | 2.61 | 2.78 |
| Wood and Furnishings | 1.63 | 3.43 | 4.69 | 1.53 | 3.09 | 3.33 | 1.37 | 2.41 | 3.17 |
| Printing and Other Industries | 1.74 | 2.82 | 4.73 | 1.64 | 3.20 | 4.52 | 1.46 | 2.68 | 3.27 |
| Construction | 1.43 | 2.78 | 3.50 | 1.36 | 2.54 | 3.60 | 1.22 | 2.14 | 2.57 |
| Transportation | 1.47 | 2.92 | 3.76 | 1.39 | 2.66 | 3.16 | 1.24 | 2.23 | 2.70 |
| Commerce | 1.53 | 3.05 | 3.85 | 1.44 | 2.77 | 3.47 | 1.29 | 2.32 | 2.83 |
| Other Services | 1.36 | 2.77 | 3.65 | 1.28 | 2.15 | 3.24 | 1.15 | 2.09 | 2.56 |
| Average | 1.52 | 2.97 | 3.94 | 1.43 | 2.73 | 3.52 | 1.28 | 2.31 | 2.81 |
| Standard Deviation | .09 | .18 | .39 | .09 | .26 | .35 | .07 | .17 | .21 |

TABLE A5.39.--Social Benefit-Cost Ratios, Case: Bachelor Skilled Workers. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|------|------|---|------|------|---|-----|------|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | .54 | 1.14 | 1.58 | .50 | 1.03 | 1.38 | .45 | .84 | 1.06 |
| Food, Beverages and Tobacco | .52 | 1.18 | 1.75 | .40 | 1.05 | 1.48 | .43 | .84 | 1.09 |
| Construction Materials and Ceramics | .48 | 1.04 | 1.45 | .45 | .93 | 1.26 | .40 | .76 | .96 |
| Mechanical and Electrical Industries | .56 | 1.27 | 1.18 | .52 | 1.12 | 1.58 | .46 | .90 | 1.17 |
| Chemical Industries | .53 | 1.16 | 1.67 | .50 | 1.04 | 1.43 | .44 | .87 | 1.08 |
| Textile, Clothing and Leather | .58 | 1.30 | 1.93 | .54 | 1.16 | 1.63 | .48 | .90 | 1.21 |
| Wood and Furnishings | .56 | 1.26 | 1.88 | .52 | 1.12 | 1.58 | .46 | .90 | 1.17 |
| Printing and Other Industries | .61 | 1.36 | 2.00 | .57 | 1.21 | 1.69 | .50 | .99 | 1.26 |
| Construction | .53 | 1.19 | 1.74 | .40 | 1.05 | 1.48 | .44 | .85 | 1.09 |
| Transportation | .49 | 1.06 | 1.48 | .46 | .95 | 1.29 | .41 | .78 | .98 |
| Commerce | .55 | 1.24 | 1.83 | .51 | 1.10 | 1.55 | .45 | .88 | 1.14 |
| Other Services | .46 | 1.05 | 1.62 | .43 | .93 | 1.32 | .39 | .75 | .97 |
| Average | .53 | 1.10 | 1.73 | .50 | 1.05 | 1.47 | .44 | .85 | 1.09 |
| Standard Deviation | .04 | .28 | .17 | .03 | .08 | .13 | .03 | .07 | .09 |

TABLE A5.40.--Social Benefit-Cost Ratios, Case: Bachelor Technicians. Educational Costs Included.

| Sectors | Discount Rate of 5% and Length of Stay (Years) | | | Discount Rate of 10% and Length of Stay (Years) | | | Discount Rate of 20% and Length of Stay (Years) | | |
|--------------------------------------|--|-----|------|---|-----|------|---|-----|-----|
| | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 |
| Mining | .38 | .83 | 1.19 | .35 | .74 | 1.02 | .31 | .60 | .77 |
| Food, Beverages and Tobacco | .32 | .73 | 1.09 | .30 | .64 | .91 | .26 | .52 | .67 |
| Construction Materials and Ceramics | .31 | .71 | 1.06 | .29 | .63 | .89 | .26 | .51 | .65 |
| Mechanical and Electrical Industries | .37 | .83 | 1.23 | .35 | .74 | 1.04 | .31 | .60 | .77 |
| Chemical Industries | .34 | .76 | 1.12 | .32 | .68 | .95 | .28 | .55 | .71 |
| Textile, Clothing and Leather | .35 | .79 | 1.18 | .32 | .70 | .99 | .29 | .56 | .73 |
| Wood and Furnishings | .36 | .82 | 1.26 | .46 | .73 | 1.05 | .29 | .58 | .76 |
| Printing and Other Industries | .38 | .85 | 1.25 | .35 | .76 | 1.06 | .31 | .61 | .79 |
| Construction | .32 | .69 | .98 | .29 | .61 | .84 | .26 | .50 | .64 |
| Transportation | .32 | .70 | 1.00 | .30 | .63 | .86 | .26 | .51 | .65 |
| Commerce | .33 | .75 | 1.11 | .31 | .67 | .94 | .28 | .54 | .70 |
| Other Services | .28 | .64 | .95 | .26 | .57 | .80 | .23 | .46 | .59 |
| Average | .34 | .76 | 1.11 | .32 | .67 | .94 | .27 | .54 | .70 |
| Standard Deviation | .03 | .06 | .11 | .05 | .06 | .08 | .03 | .04 | .06 |

CHAPTER VI

SUMMARY AND CONCLUSIONS

Material progress usually has been associated with the gradual but continuous transfer of economic agents from rural based traditional agriculture to urban oriented modern industry. For almost fifteen years, Tunisian migrant workers, mainly from a traditional rural society, have been crossing the Mediterranean Sea to work in European industry. Although this study of the economic effects of international migration is far from definitive, several principle findings emerge.

1. Migration reduces the aggregate level of unemployment, the costs of unemployment and public assistance, and the burdens of unemployment for specific groups of the unemployed. Tunisia suffers from chronic and intractable unemployment. Emigration provides at least a short-term solution. Migration has provided the country with a volume of employment abroad (about 200,000 people) which would have required very large capital outlays to duplicate at home. Approximately 2,000 million T.D. would have been needed to create these jobs during

1961-1971; actual investment was only 1.200 million T.D., and only 132,000 jobs were created.

2. About 90 percent of Tunisian emigrants from 1969 to 1973 were between the ages of 15 and 39, and most of the emigrants were single.

3. There has been a substantial increase in the nation's output through remittances from abroad. These constitute a flow of foreign exchange available to the national monetary authorities which decreases the dependence of Tunisia on foreign aid.

4. Since the real wage rate is higher in France than in Tunisia, the movement of Tunisians to France is entirely consistent with the general body of economic theory. If a labor supply curve has any positive elasticity, more workers are willing to offer their services at higher real wages.

5. The study tries to meet the usual objections to applying a cost-benefit approach to such a complex phenomenon as migration. Conceptually, we believe that these objections have been met as best as can be expected today.

6. Our cost-benefit model assumes that migration is associated with additional earnings and takes into account a number of variables.

7. As could be expected, the results differ according to the length of stay abroad, the social discount rate, the level of skills of migrants, and their marital

status. Two values for the exchange rate have been used. The first considers the official exchange rate adjusted for cost of living differentials, and the second uses a broader interpretation for wage differentials which takes into account differentials in the availability of various amenities. Moreover, three hypotheses concerning the probability of employment at the area of origin are used.

8. The results for the different alternatives show that the private benefits are 5.0 to 14.0 times as large as the costs (for a ten-year stay abroad).

9. The social benefit-cost ratios show a larger differential if transfer payments are not included. But if the educational costs embodied as human capital in migrant workers are included, the benefit-cost ratios can be less than one for technicians (for a ten-year stay abroad and at a 20 percent discount rate).

10. The Tunisian economy has certainly lost some scarce skilled manpower, but this does not as yet seem to have been accompanied by serious output losses. The social cost-benefit ratios for technicians is less than one but it is still positive.

This study has discussed the assumptions and limitations inherent in this type of analysis. Several difficulties were encountered.

1. The data reflect a "with and without" situation, whereas what is needed is a "before and after" approach.

2. In formulating our testing model, we made some assumptions whose main justification was computational feasibility. Finding adequate, reliable, and comparable empirical information proved the most time-consuming and frustrating task in field work. The cost-benefit model was tested with only French data because of the lack of comparable wage data in the other countries of immigration (Libya, Germany, and so forth). Cost-benefit analysis is expensive when one must collect unpublished data. Tunisian officials balked at supplying any information which might encourage migration or appear to indicate a failure of the local economy to provide jobs for its own people. But the progress of research depends to a large extent on the availability of comprehensive and accurate empirical data. Statistics of external migration for most countries leave much to be desired, and, unfortunately, the rate of improvement in recent decades has not been encouraging. Due to the traditions of state sovereignty, each country has organized its system of statistics to suit itself without any regard to international comparability. The researcher thus faces a bewildering variety of definitions and classifications.

3. Our estimates are based on the assumption of no changes in the values of the parameters over time. They are also based on actual evidence from the present and the past. In a growing economy, past and present costs and

wages and employment relationships are likely to be substantially altered over time. While the cost-benefit analysis is based on past evidence, policy makers must deal with the future. We cannot be too definite about what the future will yield, but limited available information suggests that the relatively high benefit-cost ratios will continue to obtain. We base this inference on evidence of continued underutilization of labor resources in Tunisia (including population growth) and progressive diminution of difficulties experienced by Tunisian migrants in the overseas labor markets.

4. The use of aggregate data did not allow us to control for individual characteristics such as level of entrepreneurship and achievement drive among migrants. There are no published data on the incomes or earnings of people cross-classified by age, occupation, and educational attainment.

5. Despite the fact that Tunisian migration to Western Europe and Libya has been taking place for almost fifteen years, remarkably little is known about what happens to workers who return home. Therefore, no adjustment is made in the study to consider the social returns for the home country from returning migrant workers. The spillover effects of migration may appear in many areas of an individual's and a society's life. While it has not been possible to express these in monetary terms, they have been enumerated and identified.

6. As yet, little is known about the consumption benefits of migration. The precise definition of these benefits, their operational measurability, and their quantitative significance, all require fuller exploration.

Reports and analysis of migration have been increasing, both in quantity and, on the whole, in quality. Most merely summarize, expand, or comment on the aggregate statistics available from public sources. The economic articles on migration of Larry S. Sjaastad (1962), Herbert G. Grubel and Anthony D. Scott (1966), Solomon Barkin (1967), and Harry G. Johnson (1968) are limited to definitions of the approaches and an enumeration of the systems to be evaluated. All stress the usefulness of pilot studies. The justification and the originality of the present study can be explained in the following points.

1. The analysis is made in terms of two units: the individual, who is the central figure in the decision to migrate, and the society.

2. A range of alternative values has been presented. In principle, this enabled us to test the effect of many assumptions about costs, benefits, discount rates, exchange rates, level of unemployment, and so forth. Many manpower studies give only one set of assumptions and one value of the benefit-cost ratio or the internal rate of return.

3. The approach to social cost-benefit analysis presented consists in attempting to measure as many of the consequences of migration on the Tunisian economy as possible. A deliberately narrow economic point of view has been taken, not because noneconomic factors are unimportant, but because we should at least be clear where clarity is possible.

Overall, our objective has not been to recommend policies but, rather, to assist in assessing the implications of different alternatives. If successful, we will have broadened the scope for more rational policy choices in the future. The cost-benefit study does not pretend to emerge with precise and accurate results, but it aims at providing well-defined orders of magnitude. It may offer a useful tool for action. The study provides policy makers with an ex post analysis as a basis for rational decisions. Finally, it would be grossly misleading to suggest that any cost-benefit analysis measures gains and losses with precision. Errors affect each item, arising from inadequate information, from the nature of the data, from uncertainty about projected values over time, and from "simulating" market behavior in nonmarket contexts.

APPENDIX 1

A GUIDE TO THE SOURCE MATERIAL ON THE STATISTICS OF TUNISIAN MIGRATION

A GUIDE TO THE SOURCE MATERIAL ON THE STATISTICS OF TUNISIAN MIGRATION

Observation of the vast amount of uncoordinated work on the subject of Tunisian migration prompted me to compile a sort of annotated guide in the hope that it might be of use to others working in the field. The guide is arranged according to Tunisian official sources and other official national sources.

Official Tunisian Sources

Central Bank Statistics: This is the basic source for data on the foreign exchange brought back by migrants.

Institut national de La Statistique: INS (National Institute of Statistics) publishes annual tourism statistics. These give data on Tunisians departing from or returning to the country. No indications are available on the country of visit, purpose of visit, occupation, or means of transportation.

Office des Travailleurs Tunisiens à l'Etranger, de l'Emploi et de Formation Professionnelle: OTTEFP (Tunisian Employment Service) has published data on the vacancies for and dispatch of migrants, together with

data on their geographical origins, industry, age, marital status, and occupation. These data, which, of course, only cover officially assisted migrants, are published monthly and summarized annually in the Annual Employment Report. In addition, the OTTEFP conducted more detailed surveys by interviewing at the frontier returning--both temporary and permanent--migrants. Unfortunately, these detailed surveys have never been made available officially or on a confidential basis.

Ministère du Plan (Ministry of Planning). Since the ministry is concerned with the planning of the economy, it estimates the magnitude of flows of labor and of remittances is an integral part of research on employment creation. This research was undertaken with the help of an ILO mission (Projet de Planification de l'Emploi. P.N.U.D./B.I.T.--T.U.N./71/545). Other information on migration and remittances are included in the third 4 Year Plan, 1969-72 and the fourth 4 Year Plan, 1973-76.

Other Official National Sources

Official Belgian Sources. Data on migrant worker flows to and from Belgium are published in Statistiques Demographiques. (Institut National de Statistiques, Ministère des Affaires Economiques, Brussels.)

Official French Sources. L'Office National d'Immigration (ONI) publishes Statistiques de l'Immigration. Since 1964, data on Tunisian migrants to France

have been published separately and not aggregated with other nationalities in a residual category. These data give detailed information on the origins, family status, occupation, skill level, jobs taken in France, and so forth. It is particularly useful since it contains data on the actual and official migrant flows. These are published in the Annual Report. Other information on foreign migrants in France is published in Bulletin Mensuel de Statistiques Sociales (Ministry of Public Health and Social Security and the Ministry of Labor, Employment and Population). These data are also reported in Annuaire Statistique de la France on a more aggregated basis.

Official West German Sources. The basic West German source is Ausländische Arbeitnehmer, published annually by the Bundesanstalt für Arbeit. This is the German counterpart to the French Office National d'Immigration. Since 1970, data on Tunisian immigrants has been published separately and not aggregated with other nationalities in a residual category.

Official Swiss Sources. Data on foreign migrants in Switzerland is published in La Vie Economique (Department Federal de l'Economie publique). Unfortunately, in the monthly tables Tunisia is not listed separately.

Official Libyan Sources: Data on Tunisians departing from or returning to Libya are reported in Arab Republic of Libya Yearbook. These data cover only

officially assisted migrants and do not provide basic socioeconomic profiles of the migrants.

APPENDIX 2

STATISTICAL DATA

STATISTICAL DATA

As previously explained, the diverse sources of statistics about the employment situation in Tunisia, the labor market, vary considerably in their reliability. Some important qualifications which must be made when interpreting these statistics have been included here.

A. The Population Census of 1966

The 1966 Tunisian census is the seventh since 1921. The main objective was to provide information on age, sex, and regional distribution of the population. The basic method was to assign enumerators to cover a specific area.

The first part of the questionnaire was concerned with the demographic characteristics of the people living in the same dwelling. Each member of the family was required to identify:

1. His degree of education (but because of the many errors this information was not included in the census results);
2. The economic sector in which he was working;
3. His status and occupational group as usually performed; and

4. His employment situation. All persons 15 years of age or over, neither doing military service nor serving prison terms, were classified as economically active if they had worked to earn a living at least ten days in the month previous to the census. Persons were also classified as economically active if they declared that they usually worked and were actually searching for an available job at going wage rates.

B. Social Cost of Education

The social cost of education involves two problems:

- (1) the average level of education embodied in each category of workers; and
- (2) the cost corresponding to this level.

Since the 1966 census data do not provide an answer for the first question, we rely heavily on the work of M. Abdeljabar Bsaies, Dépenses d'Education et Croissance Economique: Le cas du Maroc et de la Tunisie. Fifty-five firms were chosen, representing about 50 percent of the total employment in the modern industrial sector in Tunisia. The results classify the workers into four levels of skill and identify for each level the human investment embodied in them. These four levels are:

N_0 : unskilled workers, level of education nil;

N_1 : skilled workers, classified into two subgroups:

- 1) N_1 : semi-skilled workers, primary education;
and
 - 2) N_2 : skilled workers, primary education plus
three years of vocational training;
- N_2 : technicians, secondary education; and
- N_3 : managerial staff, university education.

To determine the cost of education for each level of qualification, we also used the data worked out by Abdeljabar Bsaies.

| Level of Qualification | Cost (T.D.) |
|------------------------|-------------|
| N_0 | -- |
| N_1 | 170.5 |
| N_1 | 612 |
| N_2 | 1,149 |

These cost data are detailed and reliable and they take into account both capital cost and repeaters.

C. Data on Wages

The main sources of data on wages are the reports of the Census of Manufacturing Industries, which have appeared annually since 1956. No two censuses are alike in terms of coverage, tabulation plan, and definitions employed, thus making the consistency of time series difficult to ensure.

The data collected in the yearly industrial survey give only the average wage for each economic sector. No breakdown is given for each level of skill. We used this information only to study the general trend in the level of wages and for information on the secular growth of wages (Table A2.1). One further limitation of this annual survey also should be noted: it was confined to the modern sector (firms employing more than five workers). But wage levels are probably quite different for the informal sector, and these, according to Arnold G. Harberger (1972), would be the best means of evaluating the social cost of labor.

With the help of the Ministry of Planning, we conducted a survey entitled Wages, Qualification Structure for the Tunisian Economy (Structure des Qualifications et des Salaires dans les Branches non Agricoles de l'Economie Tunisienne en 1972, Ministère du Plan, Janvier 1974). The information was collected through a questionnaire sent to all the firms listed in the social security listings. In addition, we interviewed about 100 firms to corroborate the answers mailed in. The reference period for the survey was the first term of 1972. The total rate of coverage with respect to the total employment in 1972 represents about 47 percent, reaching 97 percent for the mining and quarrying sector. Workers were classified into the following categories: executive and managerial;

TABLE A2.1.--Average Real Wages in Tunisia, 1961-1971 (in Tunisian Dinars).

| Sectors | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | Average Annual Rate of Growth (%) |
|--------------------------------------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|---|
| Mining and Quarrying | 526 | 518 | 509 | 489 | 437 | 454 | 518 | 502 | 474 | 458 | 484 | - .6 |
| Electricity, Water and Gas | 866 | 845 | 820 | 723 | 851 | 785 | 824 | 844 | 836 | 770 | 758 | -1.0 |
| Petroleum | 1438 | 1819 | 1770 | 1662 | 1809 | 1907 | 2227 | 2223 | 1773 | 1617 | 1526 | 1.3 |
| Food, Beverages and Tobacco | 359 | 410 | 455 | 472 | 434 | 422 | 462 | 489 | 480 | 500 | 480 | 3.2 |
| Construction Materials and Ceramics | 439 | 447 | 392 | 447 | 412 | 476 | 440 | 442 | 438 | 478 | 480 | 1.2 |
| Mechanical and Electrical Industries | 494 | 541 | 515 | 558 | 546 | 549 | 520 | 608 | 573 | 573 | 594 | 2.1 |
| Chemical Industries | 325 | 307 | 309 | 330 | 332 | 352 | 459 | 410 | 424 | 380 | 480 | 4.7 |
| Textile, Clothing and Leather | 577 | 663 | 603 | 605 | 638 | 650 | 637 | 609 | 688 | 667 | 629 | 1.1 |
| Wood and Furnishings | 255 | 368 | 361 | 300 | 320 | 302 | 309 | 284 | 310 | 343 | 372 | 4.9 |
| Printing and Other Industries | 361 | 358 | 386 | 425 | 433 | 407 | 424 | 426 | 449 | 449 | 613 | 5.9 |
| Construction | 216 | 296 | 432 | 304 | 311 | 260 | 296 | 313 | 346 | 355 | 353 | 7.1 |
| Transportation | -- | -- | 562 | 630 | 567 | 619 | 642 | 717 | 616 | 708 | 696 | 3.2 |
| Consumer Price Index | 87.8 | 84.3 | 86.7 | 90.3 | 96.3 | 100.0 | 103.0 | 105.5 | 109.9 | 111.1 | 117.4 | |

Sources: INS: Annual Industrial Surveys, 1961 to 1971; Ministry of Planning.

administrative and clerical; technical and related; skilled; semi-skilled; unskilled; and apprentices.

In addition, firms were classified by industrial sector. A further analysis was conducted to classify level of wages by the size of the firm, the location of the firm, and whether or not it was a public or private firm.

The wages for each occupational category were defined to include the total amount received by workers.

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