

HUMAN CAPITAL MIGRATION FROM LABOR-RICH ARAB
STATES TO OIL-RICH ARAB STATES AND THE
CONSEQUENCES FOR THE JORDANIAN ECONOMY

By

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CHAPTER I

INTRODUCTION

Migration of labor among countries raises two important issues in the economic literature. The first issue deals with factors influencing migration or determinants of migration. The second issue deals with the consequences and impact of migration on three groups; the sending countries and those who are left behind; the receiving countries and their citizens; and the migrants themselves.¹

This study of the migration of labor between the years 1960-1977 addresses mainly to the following two issues:

1. The determinants of labor migration among 16 Arab states including Palestinian labor emigrants from the Gaza Strip, Egypt, Lebanon and Syria.

It is appropriate at the outset to point out the limitations imposed on this issue. In this study, the migration process among the Arab states is viewed as a result of economic conditions. Hence, only the economic determinants of migration are considered. Non-economic determinants, such as political and social-human factors, although they are relevant, are not emphasized in this study though a major political hypothesis, namely the mobility of the Palestinians as a result of the

¹Michael J. Greenwood, "Research on Internal Migration in the United States: A Survey," Journal of Economic Literature, XIII (1975), p. 397.

loss of their economic base, i.e. land, resulting from the creation of Israel in 1948 and subsequent land acquisitions in 1967, is tested in this study.

2. The consequences of emigration on the Jordanian economy.

The choice of Jordan as a case to study the impact of emigration is well justified for many reasons. Important among these are: Jordan's emigrant workers in the oil-rich Arab states are about 38 percent of its total national labor force. Jordan ranks first among the Arab states according to the migration rate per population. Furthermore, Jordan has maintained relatively free mobility of its labor force and a free foreign exchange rate throughout the period under study between 1960 to 1977. Also, workers' remittances comprise a substantial portion of national income and gross domestic product (about 24 percent of the national income and 31 percent of the gross domestic product for 1977).

In this study the 16 Arab states are classified into two distinct groups on the basis of resource endowment or income. On the basis of resource endowment, the first group is considered as labor-rich (or labor abundant) Arab states (LRAS). This group includes Jordan (West Bank and East Bank), Egypt, Lebanon, Sudan, Syria, and the two Yemens (North Yemen and South Yemen). This group is also the low-income group and constitutes the labor sending group. The second group which is considered as the oil-rich Arab states (ORAS) includes Algeria, Bahrain, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). This group is also the high income group, and constitutes the labor receiving group.

Political Determinants - Limitations

A study of this nature cannot be complete without at least an attempt being made at the start to enumerate those factors existing in the countries being studied, which can in one way or another influence the study, if they lend themselves to full analysis and quantification. The author must point out here that although he is fully aware of them, yet out of choice he has decided to treat them as possible limitations and leave them out of the study.

It must be pointed out that states of this study have a common history and were at one time or another ruled by the Ottoman Empire for long periods. This has given them some common economic, cultural, social and political similarities. They were divided into the present array of states as a result of an era of colonialism which involved Britain, France and Italy. Those countries have over a number of years become independent states and naturally their national boundaries are the boundaries which at one time were set by the colonial powers. The only exception is the case of Israel and her neighbors where the lines were determined by U.N. resolutions, wars, armistice lines, etc.

The states in question were basically underdeveloped with minimal resources until the discovery of oil. Thus, their economies were basically agricultural. While Bahrain and Iraq were the first oil rich states to discover oil, yet the real development of labor migration from the labor rich states to the oil rich states began with the discovery of oil in Kuwait and Saudi Arabia. In both cases this was made possible by the fact that the said countries lacked their own trained labor force, and their sparse populations. The oil companies had to

resort to outside labor. Because of the social and economic similarities of the states of the region it was natural that the flow of migrant labor into the oil rich states be from the labor rich states of the region.

By coincidence the best labor pool to supply migrant labor to the oil rich states was the large number of Palestinians who, as a result of the creation of Israel had become refugees and were available to migrate in search of work. It later became the policy of the United Nations Relief and Work Agency for Palestinian Refugees (UNRWA) to provide the schooling and necessary training for the new and subsequent generations of refugees who could fill the jobs available in the oil rich states.

In Kuwait, for example, in 1948, the British were still ruling Kuwait and when the oil industry developed and necessitated the growth and expansion of governmental services, the British administration was more than happy to recruit and employ the former Palestine Mandate civil servants who had by then become Palestinian refugees. This also became the pattern in Saudi Arabia and Libya as oil was discovered and state services and functions were expanded.

Because of the extended family pattern in the Arab world, this early labor migration provided both the beginnings and the necessary information broadcast for later groups and generations of labor migrants. In one way distance became a non-significant variable.

There are other factors which influenced labor migrants from the labor rich states to the oil rich states then and continue to do so now. These factors can be grouped as follows:

1. Practically all of the Middle East countries studied require

that a person seeking work abroad to be in possession of an exit visa. In many countries policies determine who can leave and who is denied an exit visa. In Egypt, for example, the migrant worker had in addition, to be in possession of an exit visa, a work permit from a specified government authority before he could apply for the exit visa. In some countries the host country negotiates directly with the sending country and the agreement reached determines the number, qualifications, and other pertinent facts regarding the migrant workers.

2. The receiving or host countries have also provided a system of work permits and entry visas. Politics have also played their part in determining who is allowed to work and from what country he comes. There were, as a result, attempts made to restrict labor migration from certain countries for political reasons. This also was interpreted to mean that the host country was free to terminate the work permit and the visas of persons, groups, or even whole national units based on political considerations. This has happened several times in the past in the region in question.

3. Practically all the oil rich states have by law prohibited migrant workers from seeking to change their residence status to that of immigrants and then proceed to acquire citizenship of the country. They also do not allow their migrant workers to own real estate or open their own businesses. This has meant that once the work permit of a migrant worker expires or is terminated he has to leave the host country. This has resulted in migrant workers investing their savings out of the host country. Jordan, for example, has no restriction on the acquisition of real estate and this has helped Jordan in continuously acquiring large amounts of foreign exchange in the form of remittances from migrant workers.

4. Palestinians, except in Jordan where they are treated as citizens, are required by a resolution of the League of Arab States to preserve and maintain their Palestinian identity. The host countries of Palestinian refugees are required to deny the Palestinians the citizenship of the host country and for travel purposes issue them travel documents, issued by the host country but at the same time designating them as Palestinians. This is why Palestinians who joined the migrant labor force from Lebanon, Egypt, Syria, and Iraq (where most of them live), travel on travel documents and not passports. The host countries naturally refer to them as Palestinians and not as Lebanese, Egyptians, Syrians, etc.

5. When Israel occupied the West Bank and the Gaza Strip in June, 1967, Israel in accordance with the "open bridges" policy allowed the Palestinians under its occupation to seek work in the Arab world. Israel did not require them to carry Israeli passports or travel documents and they continued to use Jordanian passports. This also included the Palestinians living in the Gaza Strip, who had until June, 1967 been under Egyptian administration. While some of the Gaza Strip citizens use Jordanian passports, others use Egyptian travel documents as they did before. East Jerusalem, which was occupied from Jordan in 1967 was soon, thereafter, declared annexed by Israel, and its citizens were granted Israeli citizenship. Few if any have decided to avail themselves of this and the vast majority of the Palestinians of East Jerusalem preferred to continue using Jordanian passports. It should also be pointed out that all Arab Palestinians who lived in Israel prior to 1967 are considered by the Israeli authorities as citizens of Israel and use Israeli passports. Those Palestinians are not allowed to work in the oil rich states.

For all these reasons it is difficult to determine who are Palestinians and who are Jordanians for the purposes of this study.

7. Because of what they feel to be discriminatory treatment by the Israeli ^{forces of} occupation forces, Palestinians on the West Bank and the Gaza Strip have either been forced or found it more advantageous to work in the oil rich states. This relationship is one of the causes which led them to join the migrant labor force.

8. Finally, because of political instability in some of the Arab States, persons associated with previous regimes and dissidents frequently either seek or are encouraged to seek work outside the home country. They, therefore, join the migrant labor force.

Nature of the Problem

The discovery of oil resources and investment of oil revenues in the development of the economics of the ORAS has resulted in a large difference in per capita income, and unbalanced demand for labor among the Arab states. In 1975 the average per capita income in the high income group (ORAS) was 6370.5 dollars compared to 471.4 dollars in the low-income group (LRAS),² while there were about 1,158,000 Arab immigrants who were employed by the nine countries of the ORAS.³

Jordan is among the group which does not have significant natural resources, although she is rich in human capital. As soon as the ORAS started their social and economic development in the 1960's, particularly Kuwait, Saudi Arabia, Libya, and the United Arab Emirates

² World Bank Atlas (Washington, 1976)

³ J. S. Birks and C. A. Sinclair, International Migration Project: A Summary of Provisional Findings (Durham, 1978), p. 13.

(UAE),⁴ they sought out skilled workers from neighboring Arab states, particularly Jordanians and Palestinians. By 1975 there were about 266,000 Jordanian and Palestinian workers employed in ORAS. This number is approximately 23 percent of the total Arab labor immigrants into ORAS for the same year.

This massive emigration of Jordanian workers abroad has been rendered a considerable help to the Jordanian economy in two major ways. It helped to find jobs and productive employment for those who cannot be absorbed in the domestic economy; and through the workers' remittances helped the Balance of Payments. In addition, remittances are a major source of income to many households inside Jordan. As an example, remittances from workers abroad to Jordan (West Bank and East Bank) were 6.2 million Jordanian Dinars (JD) in 1960 or about 49 percent and 13 percent of total exports and imports of all goods and services respectively.⁵ By 1977, remittances jumped to 143 million JD or about 47 percent of total value of exports and 26 percent of imports.⁶

However, since the end of 1973, the great increase in oil prices and the great jump in the oil revenues of ORAS was followed by an increase in demand for labor. This new development has drained the labor supply in Jordan and created a shortage in certain skills and semi-skilled jobs which are necessary for Jordan's development. This also started for the first time, a replacement migration to Jordan from Egypt,

⁴ Prior to December, 1971, were known separately as Abu Dhabi and Trucial States.

⁵ United Nations, Yearbook of National Accounts Statistics, Vol. I, Individual Country Data, 1977 (New York, 1978), pp. 610-16.

⁶ IMF, International Financial Statistics (Washington, 1979), p. 419.

Pakistan, and Syria.⁷

Purpose of the Study

The primary purpose of this study is to gain an empirical understanding of the increasing labor migration from Jordan, and another six Arab labor exporting countries to oil-rich Arab states (ORAS); and to study the consequences of workers' remittances on the Jordanian economy. Specifically the objectives of this thesis are to study the following problems.

1. The economic determinants of labor migration between the two groups of LRAS and ORAS; and the study of the determinants of emigration or immigration of each individual state for the two groups respectively. The econometric analysis is adopted as an analytical framework to approach this problem.

2. The impact of workers' remittances on the main macro-economic variables of the Jordanian economy, such as consumption, investment, imports, gross national income, and the balance of payments.

In order to analyze this problem, a macro-model of the Keynesian framework for the determination of income is specified for the Jordanian economy. The purpose of this model is to estimate the various propensities of consumption, imports, and investment; and to calculate the multipliers for remittances, government expenditure, foreign aid, exports and imports.

⁷J. S. Birks and C. A. Sinclair, International Migration Project: Country Case Study, The Hashemite Kingdom of Jordan (Durham, 1978), p. 1.

Significance of the Study

The exploitation of oil resources and the investment in the development of the ORAS economies, and the uneven distribution of these resources among the Arab states, are evident economic factors to account for the present pattern and direction of labor migration in the area. However, unlike other studies of migration in the area, the significance of the present study stems from the fact that it is an empirical study, and it has a wider scope. This study is an attempt to quantify the magnitude of the economic factors which contribute to the labor movement between the LRAS and ORAS. Also it is, perhaps, the only empirical study to consider all the oil-rich Arab states as a single receiving group of labor migrants from seven Arab states. This study includes all the Arab states, with the exception of Tunisia, Morocco, Somalia, and Mauritania. The exclusion of these countries, however, is due to the lack of data on these labor migrants to ORAS. Furthermore the detailed empirical study of the impact of workers' remittances on the Jordanian economy will illuminate quantitatively the benefits of emigration to the national income and the Balance of Payments and will gauge the dimensions of alternative policy targets such as controlling emigration or encouraging it.

Organization of the Study

This study is divided into six chapters. This chapter includes an introduction and presents the nature of the problem along with its significance and limitations. Chapter II includes a brief historical background of Jordan and its main economic features. The labor force and the size of migration to ORAS and their remittances relative to the

national income will also be discussed. A review of some of the theoretical and previous empirical studies on labor migration is presented in Chapter III. The methodology used in the present study is given in Chapters IV and V. Models of labor migration determinants from Jordan and other Labor-Rich Arab States (LRAS) to Oil-Rich Arab States (ORAS), are developed in Chapter IV. The analysis of the estimated models and findings are also discussed in this chapter. The consequences of workers' remittances for the Jordanian economy are analyzed in Chapter V. A simple macroeconomic model is developed and estimated showing the impact of remittances on major macro variables such as consumption, imports and income. Finally, the last chapter contains a summary of the study, conclusions, and recommendations for public policy.

CHAPTER II

JORDAN: ASPECTS OF LABOR MARKET, MIGRATION AND REMITTANCES

The occupation of the West Bank of Jordan by Israel in the war of June, 1967, disrupted many aspects of the unified economic life of the West and East Banks of Jordan. Hence, it becomes imperative in a study of the Jordanian economy to make a distinction whether Jordan refers to the East Bank, West Bank, or both East and West Banks. In this study the preceding distinction is made when necessary, i.e. Jordan (E/Bank, W/Bank, or E/W Bank).

In this chapter there are four sections. The first section gives a brief historical background of Jordan. The second section presents some aspects of the population, labor force and employment situation prior to and after the June, 1967, war between Israel and the Arabs. Also, an estimate of the migrant workers originating from both banks of the Jordan River to the oil-rich Arab states is included in this section. The third section presents a brief analysis of workers' remittances and their importance relative to macro-economic variables such as national income. This is presented in two forms: the first for the East Bank and the second for both East and West Banks. Finally, the fourth section examines the role of workers' remittances in Jordan and their understatement in an international perspective.

A Historical Background

The Hashemite Kingdom of Jordan, formerly Transjordan, became a sovereign independent state on March 22, 1946.¹ The part of Palestine remaining to the Arabs under the armistice with Israel of April 3, 1949, with the exception of the Gaza Strip, was on December, 1949, placed under Jordanian rule and formally united with Jordan on the 24th of April, 1950.² The total area of Jordan is 36,909 square miles (95,594 square kilometers). Situated on both banks of the Jordan River, it is bounded in the North by Syria, in the East by Iraq, in the Southeast and South by Saudi Arabia, and in the West by Israel. Jordan has 12 miles of coastline on the Gulf of Aqabah in the Southwest, where Al-Aqabah, Jordan's only port, is located. The Western border divides Jerusalem into the Western (Israel) and Eastern (Jordan) sectors.³ As a result of the Arab-Israeli War of June, 1967, Israel occupied all the territory on the West Bank of the Jordan River, including the Jordanian sector of Jerusalem. The occupied area is about 2,270 square miles (5,879 square kilometers), and represents about six percent of Jordan's total territory and one half of its agricultural land.⁴

Population, Labor Force and Workers' Migration

A census of population in Jordan was conducted in November, 1961.

¹The Statesman's Yearbook, 1976-77 (London, 1976), pp. 1101-03.

²Ibid.

³The New Encyclopaedia Britannica, Macropaedia, X, p. 270.

⁴Ibid.

The census enumerated a total of 1,706,226 Jordanians, of which more than one-quarter were displaced Palestinians as a result of the creation of Israel in 1948. Of the total, 805,450 persons, or 47.2 percent, were living in the West Bank and 980,776, or 52.8 percent, were living in the East Bank of Jordan.⁵ These population totals do not include the Jordanians working abroad. The census estimated the total number of emigrants outside of Jordan to be around 64 thousand, of which 50 thousand, or 78 percent, originated from the West Bank.⁶

In mid 1975, the total population of Jordan was estimated as 2.7 million. This figure represents a 3.3 percent annual rate of natural increase based on the 1961 census. Table I shows that the labor force annual rate of increase was 3.75 percent over the period of 1961 to 1975, or an increase from 390 thousand labor force to 652 thousand. The crude participation rate (defined as total labor force divided by total population) was 22.9 percent for 1961 as compared to 24.1 percent for 1975. The employed labor had increased at an average annual rate of 4.1 for the same period, or from about 363,000 workers to about 639,000. The unemployment rate dropped from a high of seven percent in 1961 to about two percent by 1975 (see Table I).

Population, Labor Force and Employment
by Sector After 1967

The occupation of the West Bank of Jordan by Israel in the war of

⁵Department of Statistics, Statistical Yearbook (Amman, 1974), p. 1.

⁶Issam Sakhimi, "Palestinians in the East Bank," Palestinian Affairs, LXVIII/LXIX (1977), pp. 187-209.

TABLE I

PRE-1967: JORDAN (WEST BANK AND EAST BANK)
 POPULATION, LABOR FORCE AND EMPLOYMENT
 1961-1975

	1961	1966	1975	Rate of Increase Per Year Percentage
Total Population	1,706,226	1,977,000	2,700,000	3.3
Labor Force	390,000	458,000	652,000	3.75
Employed	362,700	440,800	638,308	4.1
Unemployed	27,300	17,900	13,692	-
Unemployment Rate	7%	3.9%	2.1%	-
Crude Participation Rate	22.9%	23.2%	24.1%	-

Sources: Figures for 1961 and 1966 are from Michael P. Mazur, "The Economic Development of Jordan," (unpub. Ph.D. dissertation, MIT, 1972), p. 143. Figures for 1975 are from the International Labor Organization, Yearbook of Labor Statistics 1978 (Geneva, 1978), p. 36. Unemployment rate of 2.1 percent for 1975 is from International Migration Project, Country Case Study, The Hashemite Kingdom of Jordan (Durham, 1978), p. 6.

June, 1967 disrupted many aspects of the unified economic life of the West and East Banks of Jordan. This disruption was most serious in its effect on the distribution of population, manpower and employment in both West and East Banks of Jordan. By the end of May, 1969 there were an estimated 550,000 to 600,000 Arabs displaced as a result of Israeli occupation of the West Bank, Golan Heights, and the Gaza Strip and Sinai. A third of these were original Palestinian refugees and their children (about 182 to 200 thousand) most of whom relocated in the East Bank of Jordan.⁷ Other estimates put the total displaced persons from the West Bank and the Gaza Strip who relocated in the East Bank from June, 1967 to the end of 1968, at around 442,000 persons, including 40,000 persons from the Gaza Strip.⁸ Those who had suffered the most as a result of the war had emigrated during the months immediately following June, 1967. Included in this group were many refugees of 1948 and natives of the West Bank including governmental employees, large numbers of professional people, students, and families dependent on remittances from family members working abroad.⁹ By the end of 1967, the West Bank had a total population of about 586,000. This figures excludes the 65,000 Arab population of East Jerusalem which had been unilaterally annexed by Israel and placed under full Israeli sovereignty.

Until the beginning of 1969, the population of the West Bank declined to a low of 584 thousand as a result of emigration. Since then,

⁷ Europa Publications, The Middle East and North Africa 1969/70 (London, 1970), p. 93.

⁸ Council for the Advancement of Arab British Understanding, A Just Settlement of the Refugee Problem: Records of a Seminar on the Palestine Refugee Problem (London, 1973), p. 20.

⁹ Vivian A. Bull, The West Bank - Is It Viable? (Lexington, 1975), p. 112.

however, the population has increased. By the end of 1975, the total population of the West Bank reached 665,100. This gives an annual rate of population increase over the eight years of about 1.6 percent, from the end of 1967 to the end of 1975. This population growth rate is less than the natural increase of 3.3 percent experienced in Jordan for the period between 1961 to 1975. This low rate of population increase suggests a continued emigration by the end of 1975 from the West Bank.

Table II shows the population, labor force and employment by sector for the West Bank and East Bank separately for 1975. Two observations are appropriate with regard to the figures in this table. The first is the fact that the figures do not include the Jordanians from the East or West Bank who are working abroad. The second, is the employment of the labor force by sector for the East-West Bank is not comparable, because about 40,000 workers of the West Bank, or about 30 percent of the total, were working in the Israeli economy. The total labor force for the East Bank of Jordan was 380,000 out of total population of 1.9 million, representing a crude participation rate of 20 percent. The total employed workers in the West Bank was 133,900 out of a total population of 665,100 or approximately a participation rate for the West Bank of 20.1 percent, roughly the same as for the East Bank. These low labor-force participation rates can be attributed to a number of factors including the low age profile of the population, the high rate of school enrollment, the low female participation in the labor force, and to a large young emigrant number of workers in the labor-rich Arab states.

The largest share of East Bank employment, 63 percent, is in services. When compared to the West Bank's share of 42 percent this appears very high. This large difference could perhaps be explained by

TABLE II

POST 1967: EAST BANK AND WEST BANK OF
 JORDAN, POPULATION, LABOR FORCE AND
 EMPLOYMENT BY SECTOR FOR 1975

	East Bank		West Bank	
	Thousands	Percentage	Thousands	Percentage
Population	1900		665.1	
Total Employed	380		133.9	
Crude Participation Rate		20		20.1
Employment by Sector:				
Agriculture	68	18	44.2	33
Manufacturing	72	19	33.5	25
Services	240	63	56.3	42

Sources: Figures for the East Bank of Jordan are derived from the National Planning Council, Jordan Five Year Plan 1976-1980 (Amman, 1976), p. 25. Figures for the West Bank are from the Statistical Abstract of Israel 1978 as derived by Rose Musleh, "Industry in the West Bank for 1967-1979, Firms, Labor and Wages," Palestinian Affairs, XCIX (1980), pp. 3-32.

the fact that the total number of workers of the East Bank includes the public sector and the armed forces, while the West Bank does not have a large public sector or any army. The remaining percentage of the total labor force employed for the East Bank amounts to 18 percent in agriculture and 19 percent in manufacturing. The equivalent figures for the West Bank are 33 percent in agriculture and 25 percent for manufacturing.

Jordanian (Including Palestinian)

Workers in the Oil Rich Arab

States

The estimated number of Jordanians from the West Bank, and East Bank found to be working abroad in the 1961 census was approximately 64,000. The majority of those abroad were in the oil-rich Arab states and in particular Kuwait, where about 50 percent of all Jordanians abroad were located in 1961.¹⁰

By the end of 1975, the total number of Jordanians and Palestinians had increased to about 266,000, distributed among nine countries of the oil-rich Arab states. As Table III shows about 66 percent of the total were working in Saudi Arabia, 18 percent in Kuwait, 10.9 percent in both Libya and the United Arab Emirates, and about 5.1 percent in Iraq, Algeria, Oman, Qatar and Bahrain.

The published figures for Jordanians and Palestinians in the ORAS do not make a distinction between Jordanians and Palestinians. Therefore, it is difficult to know precisely the proportion of those workers who come from the West and East Banks of Jordan, those who carry the

¹⁰M. P. Mazur, "The Economic Development of Jordan," (Unpub. Ph.D. dissertation, MIT, 1972), p. 125.

TABLE III
 JORDANIAN (INCLUDING PALESTINIAN) WORKERS
 ABROAD BY COUNTRY - 1975

	Number	Share in Percentage
Saudi Arabia	175,000	66
Kuwait	47,653	18
Qatar	6,000	2.26
Bahrain	614	0.23
United Arab Emirates	14,500	5.45
Libya	14,150	5.31
Iraq	5,000	1.88
Algeria	400	.15
Oman	2,600	.97
Total	265,917	100

Sources: J. S. Birks and C. A. Sinclair, International Migration Project: A Summary of Provisional Findings (Durham, 1978), p. 13; Zafer H. Ecevit, International Labor Migration in the Middle East and North Africa, paper presented to the Rockefeller Conference on International Migration (Bellagio, Italy, 1979), p. 5.

Jordanian nationality, and the Palestinians who mainly come from the Gaza Strip, Egypt, Syria, and Lebanon. An estimation of the Jordanians from the East Bank only was about 150,000 in 1975. This estimation suggests that the rest (or the 116,000) are considered to come from the West Bank, Gaza Strip, Egypt, Syria and Lebanon.

The knowledge of the total number of Jordanian workers abroad and their characteristics, differentiated into Jordanians (including Palestinians, from West Bank and East Bank) and Palestinians from other areas, is important for Jordan's manpower and development planning policies. For example, Jordanians abroad consider the West or East Bank the home they return to once their jobs are terminated, they resign or they are retired. In fact, most of them leave their families and relatives behind. This presents to the manpower planning authorities in Jordan the problem of finding productive jobs for returning workers. To the economic development planners, workers' remittances must be channeled in such a manner as to increase the productive capacity of the country and lessen the negative impacts such as land price speculation. For the above reasons, an attempt is made to estimate the total number of Jordanian workers abroad, those who come from the West Bank and East Bank, utilizing the available data on the total number of all "Jordanians and Palestinians" in the ORAS. Two simplifying assumptions are made. The first is that all workers originate from the communities of Jordanians and Palestinians residing in the East Bank and West Bank of Jordan, the Gaza Strip, and from the Palestinians in Egypt, Syria and Lebanon. The second assumption is that the average propensity to migrate is the same for all the Jordanian and Palestinian communities in the areas of residency. The average propensity to migrate is defined as the

total labor migrants of all Jordanians and Palestinians in the ORAS in 1975, divided by the total population of all Jordanians and Palestinians who were living in the West Bank, East Bank, Gaza Strip, Egypt, Syria and Lebanon, in 1975. Using the two assumptions, the distribution of the total labor migrants by origin of residency could be ascertained by multiplying the population by the average propensity. These results are shown in Table IV. This table shows that the West Bank and the East Bank of Jordan account for 75 percent of the total Jordanians and Palestinians in the ORAS, or 198,400 workers, out of which about 143,000 workers or 54 percent originate from the East Bank, and about 55,000 workers or 21 percent originate from the West Bank. Gaza Strip labor migrants in the ORAS account for 12 percent or about 33,000 workers and about 34,000 workers or 13 percent originate from Palestinian communities in Egypt, Syria and Lebanon.

The above distribution indicates that Jordan's West Bank and East Bank) workers in the ORAS (about 198,000) are approximately 38.2 percent of the total employed work force inside both the West Bank and the East Bank of Jordan for 1975. This could mean that for every 100 jobs that were available inside, there were about 38 additional jobs available in the ORAS. In the same manner, the ratio of Jordan's labor migrants in the ORAS to the total Jordanian employed workers (inside and outside) is calculated to be approximately 28 percent. This could mean that for every 100 jobs available inside Jordan (west and East Banks) and outside Jordan (in the ORAS), approximately 28 jobs were available outside or in the ORAS.

TABLE IV
 JORDANIANS AND PALESTINIANS: POPULATION BY
 AREA OF RESIDENCY AND MIGRANT WORKERS IN
 THE ORAS BY PLACE OF ORIGIN IN
 THOUSANDS FOR 1975

	Population	Percentage	Migrant Workers in ORAS	Percentage
East Bank	1900	54	143.33	54
West Bank	730	21	55.07	21
Gaza Strip	433	12	32.67	12
Egypt, Syria, and Lebanon	463	13	34.93	13
TOTAL	3526	100	266.00	100

The above distribution of Palestinians and Jordanians was based on the assumption that the average propensity to migrate is the same for all communities in the place of origin; the violation of this assumption would certainly give different distributions. For example, if the average propensity to migrate of the West Bankers is higher than the East Bankers, then the above distribution would underestimate the number of migrants in the former and overestimate the number of migrants of the latter.

Sources: The population of the East Bank is derived from the National Planning Council, Five Year Plan for Economic and Social Development, 1976-1980 (Amman, 1976), p. 25. The West Bank includes the 65,000 population figure of the Arab Sector of Jerusalem, as it was in 1967 according to Rose Musleh, "Industry in the West Bank for 1967-1979, Firms, Labor, and Wages," Palestinian Affairs, XCIX (1980), p. 5. Population of the Palestinians in Egypt, Syria and Lebanon is from Keesing's Contemporary Archives (London, 1977), p. 28385. Total migrant workers in the oil-rich Arab states are derived from J. S. Birks and C. A. Sinclair, International Migration Project: A Summary of Provisional Findings (Durham, 1978), p. 13 and Zafer H. Ecevit, International Labor Migration in the Middle East and North Africa paper presented to the Rockefeller Conference on International Migration (Bellagio, Italy, 1979), p. 5.

Workers' Remittances and Their Significance
to Jordan's National Income and the
Balance of Payments

This section analyzes the growth of workers' remittances and their significance to Jordan's national income and the gross domestic product. Furthermore, the role of remittances and the Balance of Payments deficit is discussed and compared to the role of foreign aid in this regard.

The method used in this section to analyze the significance and role of workers' remittances is based on two sets of data. The first is based on unified national accounts estimates for both East Bank and West Bank. The second is based on estimates of national accounts for the East Bank only. Both sets of data are in current Jordanian Dinars.

The method is not without limitations. At the outset, since remittances are the same, the analysis based on the unified estimates for both banks of Jordan will be an underestimate of the significance and role of remittances, while the analysis based on the estimates for the East Bank only, will be an overestimate of such a role. Other important limitations of this analysis include "the annexation of the Arab sector of East Jerusalem into Israel," and the "open bridges" policy between the West Bank and East Bank (the existing arrangement of allowing traffic and movement of people between the occupied West Bank and the East Bank).

Since 1967, economic data of East Jerusalem, the West Bank's largest city and its vital tourist and commercial center have been included in Israeli economic statistics.¹¹ Hence, it is neither included in data for the West Bank nor separately identifiable. Therefore, estimates

¹¹ Brian Van Arkadie, Benefits and Burdens: A Report on the West Bank and Gaza Strip Economies Since 1967 (New York, 1977), pp. 32-34.

of national accounts for the West Bank which excludes East Jerusalem, are at best an underestimate of the national accounts and trade of the West Bank.

The "open bridges" policy has had an important consequence in facilitating the maintenance of a complex network of monetary and fiscal connections between the West and East Banks. For example, the Jordanian dinar has continued to circulate alongside the Israeli pound as a legal currency on the West Bank. Furthermore, the Jordanian government has continued to pay many of its former officials on the West Bank and has periodically made loans available to West Bank municipalities.¹² More importantly, the flow of people between East and West Banks make it difficult to know precisely the way the remittances are diffused between the West and East Bank economies.

In spite of the above limitations, the analysis of workers' remittances and their role and significance on the Jordanian economy (East Bank) only, and on both Banks is presented below.

Workers' Remittances and Their
Significance to Jordan's (East
Bank) National Income and
Balance of Payments

Table V shows the workers' remittances, national income, and other important elements of the National Income components of the East Bank of Jordan for the period 1967 to 1977. In this table remittances were only 11.3 million Jordanian dinars (JD) in 1967, and by the end of

¹²Ibid., p. 34.

TABLE V

WORKERS' REMITTANCES AND NATIONAL INCOME (EAST
BANK) IN MILLIONS OF JORDANIAN DINARS AND IN
PERCENTAGES FOR 1967-1977

Year	Remittances	GNP	GDP	Exports	Imports	Foreign Aid	Remittances as a Percentage of:				
							GNP	GDP	Exports	Imports	Foreign Aid
1967	11.3	142.5	131.2	20.8	59.8	50.1	50.1	8.6	54.2	18.9	22.5
1968	10.3	166.4	156.1	18.9	73.6	62.1	62.1	6.6	54.5	14.0	16.6
1969	14.0	197.4	183.4	20.6	97.7	43.8	43.8	7.6	68.0	14.3	32.0
1970	12.6	187.0	174.4	17.6	76.8	37.1	37.1	7.2	71.6	16.4	34.0
1971	13.2	199.4	186.2	17.8	88.9	36.2	36.2	7.1	74.2	14.8	36.5
1972	13.8	221.0	207.2	37.0	117.8	53.5	53.5	6.7	37.3	11.7	25.8
1973	23.2	241.5	218.3	52.4	136.4	59.5	59.5	10.6	44.2	17.0	39.0
1974	32.0	279.3	247.3	80.3	196.1	76.4	76.4	12.9	39.8	16.3	41.8
1975	63.9	342.5	278.6	118.9	301.1	140.0	140.0	22.9	53.7	21.2	45.6
1976	140.8	528.7	387.9	192.0	435.7	127.0	127.0	36.2	73.3	32.3	110.8
1977	145.9	617.9	472.0	242.0	546.2	166.0	166.0	30.9	60.2	26.7	87.9
TOTAL	481.	3123.6	2642.6	818.3	2130.1	851.7	15.3	18.2	58.8	22.6	56.5
Annual Growth Rate	29.2%	15.8%	13.65%		24.76%	12.74%					

Export and import figures include both goods and services.

Source: Central Bank of Jordan, Monthly Statistical Bulletin, XV (1979), p. 40.

1977, the remittances had grown to be 145.9 million (JD). This increase in remittances level represents an annual growth rate of about 29.2 percent over the ten year span since 1967. This high growth rate is above the annual growth rate of gross national product by about 13 percent, and more than double the growth rate of gross domestic product (GDP) for the same period.

However, a close examination of the level of workers' remittances shows that this high growth rate is a result of the large increases in these remittances since 1973. As an example, the annual growth rate of the remittances had only been 4.1 percent over the period of 1967 to 1972. In 1973, remittances increased almost 100 percent over the 1967 level. In 1977 the increases were over six times their level in 1973.

Several factors could have contributed to this high growth rate of workers' remittances. Important among these are the large increases in the number of Jordanian emigrants since 1973, and their propensity to save; also the higher incomes the new (since 1971) and old (pre 1973) Jordanian workers enjoyed in the ORAS as a result of wage and salary increases since 1973 due to inflation.¹³

The increases in the oil prices in 1973 and the higher oil revenues accruing to ORAS led to an accelerated pace of development in these countries, and attracted more labor from Jordan. A high proportion of the new migrant workers were unskilled or semi-skilled manual workers who traveled and left their families behind in Jordan, and remitted or saved a high proportion of their earnings.

Other important aspects of the significance of workers' remittances

¹³International Migration Project, Country Case Study: The Hashemite Kingdom of Jordan (Durham, 1978), p. 47.

is their role in bridging the deficit gap in the Balance of Payments. Table V shows that workers' remittances averaged about 23 percent of imports over the period of 1967 to 1977. This means that on the average, a value of one million (JD) of imports of workers' remittances could cover 23 percent of such value.

However, an alternative approach to the significance of the workers' remittances in the Jordanian Balance of Payments (East Bank), and its importance relative to the country's foreign aid receipts, would be to relate these remittances to the "import surplus" (deficit) i.e., the excess of imports over exports.

The results appear in Table VI. The trend of workers' remittances appear to have increased significantly in paying for the import surplus (deficit) since 1967). In 1977 the remittances were about 48 percent of the "import surplus" while the foreign aid was about 55 percent. The average however, over the 11 year period shows that foreign aid is more significant than workers' remittances in paying for the import surplus. This does not, however, obscure the fact that workers' remittances are direct income transfers to the household and private sector in the economy, while the foreign aid is a direct budget assistance for government and the public sector. A further analysis of the impact of each on the economy will be made in Chapter V.

Workers' Remittances and Their
Significance to Jordan (East
Bank and West Bank) National
Income

Table VII shows that the annual growth rate of workers' remittances

TABLE VI

WORKERS' REMITTANCES AND FOREIGN AID AS A
 PERCENTAGE OF IMPORT SURPLUS (DEFICITS)
 FOR JORDAN (EAST BANK) FOR 1967-1977

Year	Import Surplus Million JD	Remittances as a Percentage of Import Surplus	Foreign Aid as a Percentage of Import Surplus
1967	39	28.9	128
1968	54.7	18.8	134.5
1969	77.1	18.2	56.8
1970	59.2	21.3	62.6
1971	71.1	18.6	50.9
1972	80.8	17.1	66.2
1973	84.0	27.6	70.8
1974	115.8	27.6	65.9
1975	182.2	35.1	76.8
1976	243.7	57.8	52.1
1977	304.2	47.9	54.4
Average 67-77	119.3	36.6	64.9

"The figures of "import surplus" and the calculations of remittances and foreign aid are based on figures in Table V.

TABLE VII

WORKERS' REMITTANCES, NATIONAL INCOME AND GROSS
DOMESTIC PRODUCT FOR JORDAN (EAST BANK AND
WEST BANK) IN MILLIONS (JD) AND IN
PERCENTAGE 1960 - 1977

Year	Remittances	National Income	GDP	Remittances as a Percentage of	
				National Income	GDP
1960	7.39	101.59	98.29	7.3	7.5
1965	12.39	173.30	167.61	7.2	7.4
1970	12.64	214.10	209.86	5.9	6.0
1975	63.90	499.20	444.30	12.8	14.3
1977	145.90	799.00	663.10	18.3	22.0
Annual Growth Rate 1960-77	19.2	12.9	11.8	-	-

Sources: United Nations, Yearbook of National Accounts (New York, 1960-1977); and United States AID, Regional Cooperation in the Middle East (Washington, 1979).

was 19.2 percent for the period 1960 to 1977. This rate is higher than the realized growth rate of national income or gross domestic product, which were 12.9 percent and 11.8 percent respectively. This table shows also the importance of workers' remittances as they had increased as a proportion of the national income and gross national product. In the national income, remittances were only 7.3 percent in 1960. By 1977 they reached 18.3 percent of the national income. Comparable percentages in the gross domestic product are 7.5 percent and 22 percent.

The above analysis shows clearly the increasing importance of workers' remittances as a source of income for the Jordanians.

Workers' Remittances of Jordan: An
International Perspective¹⁴

How special a case is Jordan? Are there other countries for whom the export of human resources is a major source of foreign exchange? If so, have they broad characteristics in common? The approach to these questions was to calculate from the IMF Balance of Payments Yearbooks workers' remittances as percentages of exports for all LDCs covered therein, and for more advanced countries, such as Italy and Spain, who are major exporters of human resources. The 70 such countries for which both types of information were reported were then grouped by intervals of five percentage points, as follows:

Category I	0 - 5%	30 countries
Category II	6 - 10%	12 countries
Category III	11 - 15%	6 countries

¹⁴This section is quoted from a paper by Dr. John C. Shearer, Chairman of my thesis committee. "The Role of Remittances in the 'Brain Drain' Controversy," presented at the Midwestern Economic Association Meeting, Chicago (April, 1978), pp. 1-14.

Category IV 16% and over 22 countries

In order to qualify for a category a given country must have had at least one year at or above that category's minimum percentage during the ten-year period utilized (1967-1976). Sixteen of the 30 countries in Category I are Western Hemisphere countries while seven African countries comprise the next largest regional representation. Western Hemisphere countries account for half of the 12 countries in Category II, the other half being equally divided between African and Asian-Oceanic nations. Half of the six countries in Category III are Asian. The countries in Categories II and III present striking contrasts. Category II includes small and poor Benin (formerly Dahomey) with a 1974 population of three million and a GNP per capita of \$120, and large and not so poor Mexico (58 million and \$1,090). Category III ranges from small and poor Chad (four million and \$100) to huge and not quite so poor India (almost 600 million and \$140).¹⁵

This section is most concerned with the 22 countries in Category IV. A close examination of the IMF data for comparability necessitated dropping eight countries: Cyprus, Korea, Lebanon, Mali, Malta, Portugal, Vietnam and Western Samoa. By the criteria used, the remaining 14 countries are high in percentages of workers' remittances to exports. These percentages for the period 1967-1976 are presented in Table VIII together with 1974 data on each country's population and per capita GNP. An additional country, Mexico, which does not officially qualify for Category IV, is included for reasons which will be developed later in this section.

¹⁵ World Bank Atlas (Washington, 1976).

TABLE VIII

WORKERS' REMITTANCES AS PERCENTAGE OF EXPORTS
(1967-1976) AND POPULATION AND GNP PER
CAPITA (1974) FOR SELECTED COUNTRIES.

	Year										Average	Population (millions)	GNP Per Capita (\$US)
	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976			
Jordan	59	29	47	45	43	44	61	49	102	199	67.8	2.6	430
<u>Other Arab Countries:</u>													
Algeria	25	20	25	23	32	25	20	8	-	-	22.3	15.2	730
Egypt	-	-	4	3	3	12	11	16	-	-	8.2	36.4	280
Morocco	10	9	12	13	21	21	26	19	34	-	18.3	16.3	430
Tunisia	7	9	13	16	21	20	-	-	-	-	14.3	5.5	650
Yemen (PDR)	53	46	39	39	48	30	-	-	-	-	42.5	1.6	220
<u>European Countries:</u>													
Greece	49	50	51	54	73	69	60	37	39	36	51.8	9.0	2,090
Spain	23	19	20	19	18	15	17	12	-	-	17.9	35.2	2,490
Turkey	18	21	26	46	70	87	90	93	94	-	60.6	39.2	750
Yugoslavia	7	10	14	26	44	45	49	42	32	28	29.7	21.2	1,310
<u>Other Countries:</u>													
Haiti	31	39	42	35	88	26	29	32	-	-	40.3	4.5	170
Pakistan	8	13	18	13	9	21	16	18	27	-	15.9	67.2	130
Panama	-	-	17	17	15	14	9	8	-	-	13.3	1.6	1,000
Upper-Volta	41	57	57	73	85	73	80	-	-	-	66.6	5.8	90
<u>Special Case:</u>													
Mexico	-	-	9	9	7	7	6	6	-	-	7.3	57.9	1,090

Sources: International Monetary Fund, Balance of Payments Yearbook, XXIII and XXVII (1970, 1976). The percentage of remittances refers to exported goods only, i.e. excluding services. World Bank, World Bank Atlas (Washington, 1976).

A perusal of Table VIII, and especially of the country averages over the ten-year period, is revealing. It shows that Jordan, despite its phenomenal surge over the last few years, is not so exceptional as its recent extremely high percentages would suggest. Jordan's 68 percent average only slightly exceeds that of Upper Volta (67 percent), which is followed closely by Turkey (61 percent) and thereafter by Greece (52 percent, Yemen (43 percent), and Haiti (40 percent). Neither these high-average countries nor the others of Category IV are limited to the very small and/or very poor. For these countries, the lack of correspondence between their averages and their characteristics is more easily shown by ranking them, in Table IX, by average percentage of remittances to exports, and designating them, in accordance with natural breaks in the data as "small" (less than ten million population) or "larger" and as "poor" (less than \$1,000 GNP per capita) or "less poor."

Despite considerable diversity, "poor" is clearly (and not surprisingly) more descriptive of the 14 countries (ten of them) than is any of the three other designations. Thus, we have for an otherwise diverse group of countries evidence of a recent history of very substantial foreign exchange earnings through the export of manpower. For four countries the ten-year average of officially reported workers' remittances exceeded half the value of exports. For two of these countries, Jordan and Upper Volta, officially reported remittances were approximately two-thirds of exports. In each year since 1972, Turkey's officially reported remittances closely approached the total value of exports, and in 1975 and 1976 Jordan's at first exceeded and then doubled the value of exports.

TABLE IX
 CHARACTERISTICS OF SELECTED COUNTRIES RANKED
 BY AVERAGE PERCENTAGE OF REMITTANCES OF
 EXPORTS (1967-1976)

	Average Percentage	Characteristics			
		Small	Larger	Poor	Less Poor
Jordan	67.8	x		x	
Upper Volta	66.6	x		x	
Turkey	60.6		x	x	
Greece	51.8	x			x
Yemen (PDR)	42.5	x		x	
Haiti	40.3	x		x	
Yugoslavia	29.7		x		x
Algeria	22.3		x	x	
Morocco	18.3		x	x	
Spain	17.9		x		x
Pakistan	15.9		x	x	
Tunisia	14.3	x		x	
Panama	13.3	x			x
Egypt	8.2		x	x	
Frequency		7	7	10	4

The Understatement of Workers'

Remittances

For most or all countries the actual amounts of workers' remittances are considerably greater than those reported officially. Jordan is probably typical in basing its official figures on Central Bank clearings of private checks from abroad. It does not add an adjustment for estimated remittances which do not pass through its hands. Although no estimate is available, it is widely known that unreported remittances are quite large in Jordan, as elsewhere. Despite the absence of foreign exchange restrictions in Jordan, the large unidentified flows reflect both the personal convenience of carrying cash on visits home (or sending it with relatives or friends) and the preferences of a considerable portion of migrant workers (especially those at lower educational levels) never to use the banking system. In countries where exchange controls exist, the personal conveyance (in this case, smuggling) of cash assumes considerably greater prominence.

Some spotty evidence tends to corroborate the vast official understatement of workers' remittances. As shown at the bottom of Table VIII the officially reported remittances for Mexico are moderate percentages of exports, averaging 7.3 percent over recent years. The IMF reports these remittances for 1971 through 1974 as 132, 139, 139 and 195 millions of dollars, respectively.¹⁶ These official figures could be demonstrated to represent only a small portion of the actual remittances. Suppose that all the officially reported remittances came only from "illegals" in the United States (with none from other countries, from legal

¹⁶ International Monetary Fund, Balance of Payments Yearbook, XXVII (Mexico, 1976).

immigrants, "Green Carders," etc.). Applying the published estimates by the U.S. Immigration and Naturalization Service¹⁷ of between two and twelve million illegal aliens (predominantly Mexican and most of recent origin) leads to interesting results. Assuming that half of the two million (low estimate) were working, their average individual remittances would have been a paltry \$195 in 1974. If half of the high estimate of 12 million illegals were working, their 1974 remittances would have averaged a miniscule \$32.50. Suffice it to suggest that actual remittances to Mexico must be a considerable multiple of those reported. Although special circumstances may make the difference between reported and actual remittances greater for Mexico than for most other countries, aspects common to most high remittance countries, especially poverty, suggest that actual remittances are universally and considerably greater than those reported.

The evidence in this section shows that for Jordan and other countries, especially certain poor ones, the export of their human resources constitutes a major, and sometimes the dominant, source of reported "export" earnings through remittances. The actual remittances considerably exceed those reported and, for a number of countries, constitute one of their major economic realities, the effects of which are pervasive. Evaluation of the impact of workers' remittances on the home economy would understate their effect if it is based only on the official data. The more correct evaluation would take the actual remittances (reported and unreported) into consideration.

¹⁷"Poor Mexicans Flood Into U.S. to Seek Jobs, Deluging Border Patrol," The Wall Street Journal (September 9, 1977), p. 1.

CHAPTER III

ECONOMIC THEORY AND LABOR MIGRATION:

A REVIEW OF THE LITERATURE

This chapter is divided into three main sections. The first section reviews the theoretical foundation of the economics of labor migration and considers a number of models specified in the literature to analyze the determinants of labor migration. The second section reviews a number of empirical studies of determinants of migration. Finally, the third section reviews the theoretical and empirical consequences of labor migration.

Theoretical Basis of Labor Migration

The theoretical analysis of labor migration is based mostly on the neoclassical general equilibrium theory of factor mobility. This theory predicts that in a situation characterized by international differentials in real wages, labor will migrate from the low wage to the high wage region, until real wages are equalized.

The above theory has been substantiated by Mundell,¹ who shows that in a situation where factor mobility is perfect, commodity mobility

¹Robert A. Mundell, "International Trade and Factor Mobility," American Economic Review, XLVII (1957), quotation in Harry W. Richardson, Regional Economics: Location, Theory, Urban Structure, and Regional Change (New York, 1972), p. 287. *

is imperfect, and inequality exists in factor prices between countries, then factors would move in such a way as to equalize factor prices. Restrictive assumptions are necessary to arrive at such a conclusion. Important among these are homogenous factors, constant return to scale, zero migration cost, full employment and perfect factor mobility.

The theoretical implication of the classical view is the emphasis it gives to relative real wages as the adjusting factor in bringing an equilibrium in the labor market between countries, or within a region, and, accordingly, real wage is considered a central determinant factor of labor migration.

The above framework, however, is not the only one. Another view recognizes the shortcomings of the traditional restrictive assumptions such as the zero migration cost, and the perfect mobility. This view explains labor migration among regions as a result of a disequilibrium process, rather than a marginal adjustment. In this respect labor migration can be explained as a response to disequilibrium in the labor market.² This alternative view postulates the demand and supply functions of labor as expected by the potential migrants. Migration between any two regions is then viewed as determined by the expected excess demand for labor gap between the two regions.³ This view allows for social and economic factors, barriers to migration which slow down the response to the relative expected excess demand gap.

²Pan A. Yotopoulos and Jeffrey B. Nugent, Economics of Development: Empirical Investigation (New York, 1976), pp. 219-220.

³Ruth A. Fabricant, "An Expectational Model of Migration," Journal of Regional Science, X (1970), pp. 13-24.

Models of Migration

It is possible to classify economic models of migration into three groups: on the basis of functional specifications, of theoretical hypotheses, or human capital/labor market oriented models.

Functional Specifications. Despite the variety in models suggested in the literature, they can be classified into three main specifications: ad-hoc models, gravity models, and Markov chain models.⁴

The ad-hoc models usually have the migration flow (total numbers), or rates (total numbers divided by respective population) as a dependent variable to be determined by a set of independent or explanatory variables. On the basis of the economic theory, migration into a region may be expected to be a function of the regional wage rate, or per capita income, and employment rate. Ad-hoc models are specified in linear regression form.

The gravity models, unlike the ad-hoc models, use log linear specifications, and are based on an analogy with physical phenomena. The population of a region or a country is considered a mass concentrated at its center. Migration between two regions or places is a function of the gravitational attraction of the two places.⁵ This model can be utilized to include more explanatory variables to estimate "push" and "pull" factors important to each place. The "push" factors, are factors

⁴National Institute of Economic and Social Research, Regional Papers II (Cambridge, 1973), pp. 51-107.

⁵Ibid., p. 58.

that move migrants away from certain regions. The "pull" factors are factors that attract migrants to some places.

Finally, Markov chain models, unlike the above two specifications, are not fitted by a least square estimation. Instead, the observed pattern of migration during one time period is summarized in a set of fixed coefficients (migrants divided by origin's population, this is called the transition matrix or matrix of distribution). The fixed coefficients are also assumed to hold in the future. In Markov chain-type model, only the size of the population of the region of origin is allowed to affect the level of migration. In its restrictive assumption of fixed coefficients, it is analogous to input-output analysis. This type of model is utilized to generate forecasts of future migration or population in conjunction with models of births, deaths, and interregional migration.⁶ The basic advantage of the Markov chain model is that it establishes a set of coefficients that may be multiplied into regional populations to form estimates of the level of interregional or international migration.

Theoretical Hypotheses. The classification of theoretical hypotheses according to Richardson, falls into two broad classes, deterministic or probabilistic hypotheses. With regard to deterministic models, the rate of migration is determined by objective economic conditions, such as wage difference between regions, distance traveled or the

⁶ Ibid., p. 56.

⁷ Harry W. Richardson, p. 298.

availability of information to the potential migrant. In this type of hypothesis, the focus is on the assumption that individuals act as rational economic beings. This also implies that migration will occur once the economic conditions, such as earning differentials, are favorable. No allowance is made for differences among the potential migrants with respect to age, sex, or skill.

Probabilistic models, unlike the above type, allow individuals to have attachment to a region inertia, and the exercise of free choice. Thus, the decision to move will depend upon the individual and it will not be the same for each. For instance, although substantial earning differentials may induce some migration, non-economic factors have also to be taken into consideration to the extent that they may offset large income gains. In summary, the probabilistic hypothesis postulates that the decision to move will depend upon earning gain from movement, the direct cost, and the disutility of moving. Evidently, the earning differentials required to induce migration will vary among individuals primarily because the disutility of moving is much greater for some people than for others.

The significance of the above classification is twofold. One is the distinction between capacity or incentive to migrate, and actual migration. In this sense, the deterministic models equate both the incentive to migrate with migration, while the probabilistic models do not. Rather, the later models allow migration to be interpreted as a propensity to move instead of movement. This interpretation makes it possible to take the individual time preference and utility into consideration. Second, the above classification makes it possible to explain the observed migration pattern and selectivity, such as the higher

proportion of highly skilled or young among the migrants. It also helps to predict the actual level of migration from an analysis of the age, sex, or occupational distribution of the sending population.⁸

Human Capital/Labor Market Oriented Models. Under this classification migration occurs either because it is viewed as investment in human capital or as a response to the labor market mechanism.

Human capital oriented models, often cited in literature of migration are (a) The simple human capital of migration. Migration in this model is decided by the individual on the basis of a capitalized value of the differential of the net receiving-sending regions earnings stream.⁹ (b) Another model which is attributed to Todaro emphasizes the crucial role played by employment expectation in the decision to migrate. This model is termed "The Probability of Employment Model."¹⁰ It is a modification of the human capital model, and it considers the decision to migrate depends on the expected, rather than the actual receiving-sending regions real wage differentials; and the expected differential is determined by the interaction of two variables. The actual wage differential and the probability of obtaining employment in the receiving region.

The labor market oriented models could be grouped under the following.¹¹ (A) Lewis-Ranis-Fe models, which are based on the dualistic

⁸ Ibid., pp. 301-04.

⁹ Pan A. Yotopoulos and Jeffrey B. Nugent, p. 26.

¹⁰ Michael P. Todaro, Economic Development in the Third World (London, 1977), p. 194.

¹¹ Pan A. Yotopoulos, pp. 230-35.

nature of the economy. A view of how the labor markets work underlies this approach. It is based on the assumption that labor supply is infinitely elastic or very elastic, and hence, the marginal laborer migrates with either zero marginal product if he is in the surplus pool, or above zero marginal product if he is employed. In this model, labor migrates from the agricultural (traditional) sector, to the industrialized (modern) sector. (b) Sequential Job Search Models under uncertainty. Alchain, Phelps, and David utilize explicitly the job search process and unemployment in these models. According to this view, migration involves three steps, one has to quit and join the unemployed, then to engage in job search, and finally to accept a suitable job offer. This type of model emphasizes the supply side of the labor market in explaining migration, and also allows for income differentials to persist or even increase despite migration. (c) Job-Competition Models. Thurow and Lucas challenge the neoclassical models of wage-competition, where the market mechanism would ultimately through wage adjustment, bring supply and demand into equilibrium. In their alternative view, it is not the marginal productivity of the worker that determines the wage rate the job carries, but it is the marginal productivity of the job that will determine the wage rate. The job-competition model emphasizes the demand side of the labor market; this is in contrast to the sequential job-search models. The demand for job skills creates the supply of job skills. Furthermore, these types of models imply that the demand for labor determines which skills will be taught or require training in the future.

Determinants of Labor Migration:

An Empirical Finding

Introduction

Studies on labor migration are varied in kind and scope. However, two main kinds of migration can be distinguished: internal migration within a country, which occurs between rural to urban center, and international migration between countries, such as between less developed countries and developed countries. The scope of studies of migration covers the causes or determinants of migration and the impact or consequences of migration for the sending-receiving region and their populations.

The scope of studies, however, is applied to both types of migration without a significant distinction. Thus, variables which determine migration within a country could be as well the same factors which are taken as determinants of migration between countries. For example, income or wage differential as a factor or cause of migration, could be used to explain rural-urban migration as well as between low income countries and high income countries. Similar contention could be made with regard to the analysis of the consequences of migration. A "brain drain" problem, as an example, could be encountered in both types of migration, internal or international migration.

Based upon the preceding contentions below are some of the general findings of a selected number of empirical studies of determinants of migration are reviewed. The review contains both types of migration.

Empirical Findings

General Findings. In a survey on internal migration in the United States, Greenwood examines the findings of a selected number of empirical works on determinants of internal migration.¹² The following are some of the important conclusions regarding the relationship between migration as the dependent variable to be explained, and distance, income, employment status and characteristics of migrants as independent variables, or determinants to explain migration.

(1) Gross migration declines with increased availability of information. (2) Migration does occur from low to high income regions. (3) There exists a significant difference in the migratory behavior of white and non-whites. This could be as a result of whites having generally higher human capital stock as well as better job contacts than the non-whites. (4) A shortcoming of the massive literature on determinants of labor migration is the lack of explicit policy variables. Though it is useful to know the magnitude of the factors which influence migration, it is also true that there will be little use of the research results, if these factors or variables cannot be amenable to policy influences. For this reason, perhaps the simultaneous equation model approach to migration is more adequate to analyze the impact of policy decisions on migration.¹³

¹²Michael J. Greenwood, "Research on Internal Migration in the United States: A Survey," Journal of Economic Literature, XIII (1975), pp. 397-433.

¹³Ibid., p. 412.

Another evidence on determinants of internal migration is reported in literature for studies carried out on less developed countries.¹⁴ Econometric studies confirm that people tend to move for economic gains from poorer areas to wealthier areas. Studies show that when wage or per capita income differentials are included as explanatory variables in the migration function, the rate of migration increases with the size of the differentials. When average per capita income or wage level of the two areas are included separately in the function, migration is found to be positively related to the wage or income level of the destination area and, negatively related to the wage or income in the origin area. Furthermore, the findings suggest that when the expected wage (i.e., the wage rate adjusted for the probability of being employed) is used, it is found to be a better explanatory variable than the wage rate.

Contacts and distance also affect a migrant choice of location. Contacts are generally found to have a positive effect on migration to a specific area. Contacts are usually measured by the presence of relatives or by stock of persons who had migrated from the home location. Distance is generally found to be negatively related to the rate of migration.

Specific Findings. In an econometric study of the determinants of internal migration of labor in Egypt, Greenwood considers the

¹⁴Lorene Y. L. Yap, "The Attraction of Cities: A Review of the Migration Literature," Journal of Development Economics, IV (1977), pp. 239-64.

migration rate as the number of males born in the origin and enumerated in the destination during the census period of 1960 as the dependent variable, and origin and destination income, urbanization, education, and distance between origin and destination units as independent variables.¹⁵ The study considers the 25 administrative regions in Egypt as the spatial units of labor supply.

Using the least-squares method to estimate the model in the log-linear form, in which the estimated coefficients are interpreted as elasticities, the independent variables are found to explain 75 percent of the variation in labor migration and all of the estimated coefficients are significant at five percent level, and with the expected sign.

The results show that the income elasticity of migration in destination is positive but inelastic, with a coefficient of .651, and in the origin it is elastic with a negative coefficient of 1.406. This result suggests that a ten percent increase in the wage level of destination ceteris paribus, will encourage migration by 6.51 percent, while similar increases at the origin will retard migration by 14.06 percent. Distance is also found to have an adverse effect on migration. Population, of both the origin and the destination, is a significant determinant of interregional migration in Egypt. However, the "pull" effect of the population at destination at destination is twice as large as the "push" effect of population at the origin, with elasticities of positive 1.69 and .844 respectively. These results are in accord with the hypothesis that migrants are attracted to regions which have large labor markets,

¹⁵Michael J. Greenwood, "The Determinants of Labor Migration in Egypt," Journal of Regional Science, IX (1979), pp. 283-90.

or that persons tend to migrate to regions to which natives of their home region have previously migrated. Finally, urbanization measured as a percent of the population living in urban areas at the origin or destination area, is found to increase migration, emphasizing the tendency of people who migrate to urban centers, of coming from a relatively large urban population too.¹⁶

A rather different study for South Korea using the human capital approach, for the period 1961-1966, reached similar conclusions.¹⁷ The best version of the estimated relation is when migration rate is regressed on expected income in both destination and origin, distance, and affinity, which is defined as the number of persons who were born in the province of outmigration now living in the province of destination. The estimated parameters suggest that a ten percent change (increase or decrease) in the expected income at destination will change migration (increase or decrease) by 12.8 percent, while the same percentage change at destination changes migration by seven percent. The results also show that distance, although it has an expected negative sign, is insignificant, while at the same time the affinity coefficient has a positive and significant effect. This finding, the author explains, is perhaps an indication that the social space as defined by the affinity variable is perhaps more important than physical space as defined by distance. This may be considered a typical situation of the developing countries, where the job search process is highly informal or relies on

¹⁶ Ibid., p. 290.

¹⁷ Burtrand Renaud, "The Economic Determinants of Internal Migration in Korea," Applied Economics, IX (1977), pp. 307-18.

personal connections rather than labor market information.¹⁸

Finally, a study attempting to estimate the supply function of qualified emigrants from 23 countries into the U.S. is reviewed below.¹⁹ The list of countries include developed as well as developing nations.

The results show the wages of professionals in the country of destination relative to those in the country of origin, which account for about one-fourth of the variation in the propensity to emigrate. Furthermore, the implied supply elasticity (the elasticity of emigration with respect to the destination wage) is of the order 0.4. Among the other variables tried, distance was found to be unimportant, while relative per capita income had one half the explanatory power of relative wages. Also, the results show that imposing a surtax, i.e., a tax imposed on income of emigrants, would have a negligible deterrent effect on the number of emigrants. Thus, such a surtax would provide a pure revenue source to developing countries.

Consequences of Labor Migration on the Sending Country

In this section, the consequences of labor migration on the sending country from a neoclassical viewpoint and its limitations will be reviewed. Issues encountered in the "brain drain" assessment will be discussed. Finally, a selective empirical evidence on the consequences of labor migration will be presented.

¹⁸ Ibid., p. 314.

¹⁹ George Psacharopoulos, "Estimating Some Key Parameters in the Brain Drain Taxation Model," Journal of Development Economics, II (1975), pp. 309-318.

Although this study is concerned only with consequences of labor migration on the sending country, it is perhaps appropriate here to allude to the varied and rich literature on the theoretical analysis of the problem of welfare effects of the international migration of labor. This literature occasionally has divergent conclusions, due mainly to the different theoretical analyses which are applied to the many facets of such a problem. Those different theoretical analyses, according to Bhágwati and Rodríguez can be classified according to whether (a) they use a comparative-static or dynamic formulation; (b) they assume a perfectly competitive model or one with policy imposed distortions; and (c) they address themselves to the welfare of the country of emigration or immigration, or take a world-welfare viewpoint.²⁰

The Neoclassical Viewpoint and Its Limitations

"The consequences of international labor migration on the country of origin would be neither worse nor better off. If the migrant sends funds back home, then the nation would gain." This general conclusion is argued by Grubel and Scott.²¹ This argument assumes that the migrant has been employed and is paid his marginal product, and that when he moves out of the country he withdraws his consumption which is equivalent to his contribution to production.

²⁰Jagdish Bhagwati and Carlos Rodríguez, "Welfare Theoretical Analysis of the Brain Drain," Journal of Development Economics, II (1975), pp. 195-221.

²¹Herbert B. Grubel and Anthony D. Scott, "The International Flow of Human Capital," American Economic Review, LVI (1966), pp. 268-83.

A counterargument forwarded by Aitken shows the limitations of this analysis and demonstrates that if a finite (small number) of migrants leave, the country of origin will lose.²² The deadweight loss or the familiar surplus would be the area of a triangle under the marginal product curve and between the old wage without migration, and the new higher wage after migration. This loss could be significant.

This discrepancy between the two analyses stems from the assumption implied in Grubel's and Scott's analysis, that only one skilled worker (at the margin) leaves at a time; that in the interim between departures, the real wage paid to those with the same kind of human capital owned by the migrants adapts to their new higher productivity. Then, the second marginal migrant leaves and the process repeats itself. In other words, this analysis is comparing a series of separate static comparisons of an economy with and without the skilled worker at the margin. While the correct analysis, Aitken claims, must be based on the comparison of the income of the population remaining after all emigrants have departed to the income the same population had been receiving prior to the departure of the skilled workers.²³

Apart from the above limitation, the neoclassical theory of factor mobility assumes homogeneous labor. This overlooks the fact that migration is a selective process where the best trained tend to have the highest rates among the migrants, and generally may be in short supply and essential for the process of development of the origin country.

²²Norman D. Aitken, "The International Flow of Human Capital: Comment," American Economic Review, LVIII (1968), pp. 539-48.

²³Ibid., p. 545.

Issues in the "Brain Drain" Assessment

A meaningful assessment of the potential loss or gain to the sending country due to the inter-nation labor migration and particularly the highly skilled labor, the "brain drain" problem, should investigate the following questions:²⁴

1. What happens when the loss of human capital is significant rather than marginal?

This question implies three issues. The benefit-loss issue which has been analyzed above, the income redistribution issue, favoring perhaps the non-migrant skilled and the capital owners, and finally the effect on the rate of economic development.

According to Hirshman, Myrdal, and Kaldor, economic development in the sending country or region will be adversely affected.²⁵ This conclusion is explained by the circular and cumulative causation or the polarization effect which manifests itself as the inability of the poor regions to compete with the rich regions, the selectivity of labor mobility, and the interregional wage differentials and growth. All of these factors will cause more migration to the benefit of the advanced regions, and leave the original region stagnant.

The counter-argument, however, maintains that the outflow of skilled workers may only take from the country the amount of capital equal to the average ratio of the sum of human and physical capital per worker.

²⁴H. Peter Gray, *International Trade, Investment and Payments* (Boston, 1979), p. 331.

²⁵Nicholas Kaldor, "The Case for Regional Policies," *Scottish Journal of Political Economy*, XVII (1970), pp. 337-47; G. Myrdal, *Rich Land and Poor Land* (New York, 1957); A. O. Hirshman, *The Strategy of Economic Development* (New Haven, 1958).

In that case, average capital per worker necessary to sustain a steady growth, would not be reduced and per capita national income would remain roughly constant.

2. What happens to the savings rate of society when human capital leaves?

This dimension of the problem is concerned with the saving propensities of the migrants in comparison with those left behind. If the migrants' average propensity to save exceeds the national average, then the national rate of saving will be reduced. In absence of compensating remittances, this loss could be significant.

3. How significant are adjustment costs in the short and long run?

The short-run costs are usually seen as any losses in production caused by the inability of the society to adapt instantly to the loss of a set of skills embodied in the migrant. The long-run cost is the cost which occurs over the period to find or train a replacement. Furthermore, if the country needs to maintain a given proportion of educated people, then the emigration of some of them forces the country to provide more education than would otherwise be necessary. This certainly would also be in addition to the above mentioned costs. This additional cost of expanding education has no corresponding social gain unless, as Johnson has argued, the migrants make large transfers to their countries of origin.²⁶

4. Finally, does the "brain drain" adversely affect the nation's future capacity to acquire human capital?

²⁶ Harry Johnson, The Economics of the 'Brain Drain: The Canadian Case, Minerva (1967), pp. 304-06.

As the expression "brain drain" is formally used, it applies to people qualified in a profession and refers more to acquired skills than to native intelligence. However, there is a Darwinian element in the "brain drain" problem also.²⁷ This argument maintains that both qualities, the ability to acquire human capital and the possession of intelligence, are directly related. Hence, the "brain drain" reduces the stock of human capital left in the country of origin and as a result is likely to cause a reduction in the average level in future generations.

In summary, the "brain drain" may be advantageous or detrimental to the origin country depending on whether the characteristics of the migrants are such that their activities confer positive or negative externalities on the people around them.

Empirical Evidence on the Consequences of Labor Migration

The following review will include international as well as internal migration of labor, and will deal only with the most important evidence on the micro-macroeconomics aspects.

On the International Level. In an evaluation of the impact of migration of highly skilled labor from Less Developed Countries (LDC) to Developed Countries (DC), Thomas concludes that it is not possible to measure the extent to which the emigration to Developed Countries has restricted the growth of Less Developed Countries.²⁸ The divergence

²⁷H. Peter Gray, p. 331.

²⁸Brinley Thomas, Migration and Urban Development (London, 1972), p. 230.

between the real growth rate per capita between the two groups in the 1960's for example, could be attributed largely to the differential rate of growth of population. He recommends that any estimate of the role of the "brain drain" as a factor contributing to this divergence be done by examining each developing country separately, as conditions may vary so much.

In another study, Shearer furnishes new evidence on the benefits of the "brain drain" to the origin country.²⁹ In this comprehensive study the author surveys workers' remittances for LDC, and semi-developed countries such as Greece and Mexico. The micro-macroeconomic aspects of the problem are analyzed. The author concludes with respect to the microeconomic aspect of the actual workers' remittances (reported and unreported remittances), that most go directly to the poor families of the migrants' home country, and this perhaps constitutes the most efficient form of foreign aid.

The macroeconomic aspect of the workers' remittances is also evaluated in this study. The author's evidence suggests that for a number of LDCs, remittances constitute a considerable percentage of the total value of exports (in the case of Jordan, they averaged 67.8 over the ten-year period of 1967-76). This reflects an obvious gain of foreign exchange, which in many cases, its lack reflects one of the basic obstacles facing LDC. Based on the above evidence, the author recommends a close investigation of workers' remittances for each individual country, and it might be the justification to encourage rather than

²⁹ John C. Shearer, "The Role of Remittances in the 'Brain Drain' Controversy," a paper presented at the Midwestern Economic Association Meeting, Chicago, April, 1978, pp. 1-14.

discourage the export of human capital.

Yet another study of the effects of labor migration in North Yemen, shows adverse effects on production, increasing consumption imports, and higher prices of land.³⁰ Two main factors contribute to the above conclusions. One is the labor intensive nature of agriculture in North Yemen, and the inability of the country to absorb the available technology to replace the migrant workers. Also, the high wage of the remaining workers forces the marginal land to be dropped out of cultivation, and hence production declines and the country has to increase its imported food. The second factor explains how the prices of land go up. Despite a favorable effect on household income due to workers' remittances, they manifest undesirable effects because of the desire to translate wealth into capital in the face of a limited investment opportunity. This creates greater demand for land and hence their prices are inflated.

On the Internal Level. In migration literature a considerable volume of studies on the consequences of labor migration is concerned with the internal migration between low-income low-wage regions (South), and high-income high-wage regions (North). A central empirical argument of these studies is whether migration equalizes factor return (wages) between North and South or helps the growth of regions. Inconsistent evidence has been found for many countries.

³⁰ Jon C. Swanson, "Some Consequences of Emigration for Rural Economic Development in the Yemen Arab Republic," The Middle East Journal, XXXIII (1979), pp. 34-42.

Studies of United States South-North labor migration by Borts and Muth in separate findings, have concluded that migration of labor failed to converge wages despite a large interstate migration from low to high-wage states.³¹ Borts attributes this divergence to the strong role of demand for the products of high-wage industries in the North.

Rather contradictory findings to the above are presented by Coelho-Ghali and by Bellante in separate studies.³² For example, Bellante's study of production workers in manufacturing, using adjustment for cost of living difference between Southern and Northern per capita money earnings, concludes that the North-South wage differential does not exist.

Studies of internal migration in LDCs are also inconsistent. A study of the impact of rural to urban migration in Morocco, using a macroeconomic model, shows that higher rates of internal migration lead to an increase in total real income in Morocco.³³ At the same time, urban production share increases at the expense of agricultural share in the rural sector, which shows a decline. A similar study on Brazil finds that the internal migration has been a positive factor in the

³¹George H. Borts, "The Equalization of Returns and Regional Economic Growth," American Economic Review, L (1960, pp. 319-47; R. F. Muth, "Migration, Chicken or Egg,": Southern Economic Journal, XXXVII (1970-71), pp. 295-306.

³²Philip R. Coelho and Moheb A. Ghali, "The End of the North-South Wage Differential," American Economic Review, LXI (1971), pp. 932-37; D. Bellante, "The North-South Differential and the Migration of Heterogenous Lanor," American Economic Review, LXIX (1979), pp. 166-179.

³³M. T. Mertaugh, "The Causes and Effects of Rural-Urban Migration in Morocco," (unpub. Ph.D. dissertation, University of Michigan, 1976).

country's development.³⁴ The study also shows that increasing the rate of migration has a positive effect on the distribution of income between the urban and rural sectors.

The microeconomic studies of internal migration have focused on the amount and use of remittances which migrants send home, and on the effect of migration on the rural production process. A study of a village in India concludes that remittances facilitate a shift to crops entailing higher risks and demanding a greater investment.³⁵ The author of another study of small farmers in Uganda and Kenya concludes that urban-rural remittances constitute a significant source of working capital.³⁶

On the Middle East Region. Labor migration in the Middle East has been lately under study from international as well as national bodies and institutions. The most significant is the ILO commissioned "International Migration Project" (IMP) to study and collect data on patterns and trends of migration in the Middle East. IMP has already published several studies on labor migration for countries of the labor-rich Arab states and oil-rich Arab states.

This seminal work will be useful for many scholars and researchers and is frequently drawn upon in this study. However, its main shortcoming is the absence of time series on flows of labor migrants from each sending country to a receiving one. This is necessary for empirical testing of the variation of gross migration flows as explained by the economic variables of both the sending country and the receiving country.

³⁴Lorene Yap, "Internal Migration and Economic Development in Brazil," *Quarterly Journal of Economics*, XC (1976), pp. 119-37, a summary of the author's unpublished Ph.D. thesis (Harvard University, 1972).

³⁵S. R. Simon, "Changes in Income, Consumption, and Investment in an Eastern Uttar Pradesh Village," (unpub. Ph.D. thesis, Harvard University, 1972).

³⁶Alan R. Waters, "Migration, Remittances, and the Cash Constraint in African Smallholder Economic Development," *Oxford Economic Paper*, XXV (1973), pp. 435-54.

CHAPTER IV

DETERMINANTS OF LABOR MIGRATION FROM LABOR-RICH ARAB STATES (LRAS) TO OIL-RICH ARAB STATES (ORAS)

Introduction

This chapter is divided into two sections. The first section presents econometric models of the determinants of labor migration between LRAS and ORAS. A discussion of the model variables and specifications is also presented in this section together with the implications of the different models to be used. The estimated models and the analysis of the results and findings are presented in section two. The analysis of the results includes the findings of the models for LRAS as a labor supplier group as well as the findings for each individual country. Particular emphasis is given to the Jordanian results. The analysis of the results also includes the estimated relations for each individual labor receiving country of the ORAS and its relative attraction to labor immigration.

Econometric Models of Determinants of Labor Migration

Arab states in this study can be classified into two distinct groups on the basis of resource endowment or income. On the basis of

resource endowment, the first group could be considered as labor-rich (LRAS) or labor-abundant states. This group includes Jordan, Egypt, Lebanon, Sudan, Syria and the two Yemens (North Yemen and South Yemen). The second group which can be considered as oil-rich (ORAS) includes Algeria, Bahrain, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). On the basis of per capita income, the labor-rich group can be classified as a low-income group. The oil-rich countries can be considered a high-income group.

Based upon the above classification, three econometric regression models were specified. One model utilizes the oil revenues as an important explanatory variable in the migration function of labor from LRAS to ORAS. This model is termed the "Oil Attraction Model." The second model utilizes income level in both destination and origin as important variables to account for "pull" or "push" variables in the migration function of labor. This model is termed the "Income Attraction Model." The third relation to be specified is a simple version of the theory of investment in human capital. This model considered the relative income ratio between the destination and the origin countries as the important variable to account for the observed migration pattern between the two groups. This model will be termed as "Investment in Human Capital Model." All three models are essentially the same; and relying on elements of "push-pull" factors and "human capital theory."

The labor migration models for LRAS to ORAS are specified as follows:

Oil Attraction Model

$$(1) M_{ij} = f (OR, Y_i, P_i, D_{ij}, e)$$

Income Attraction Model

$$(2) \quad M_{ij} = f (Y_i, Y_j, P_i, P_j, D_{ij}, e)$$

Investment in Human Capital Model

$$(3) \quad M_{ij} = f (Y_j/Y_i, P_j/P_i, D_{ij}, e)$$

where:

M_{ij} = The number of migrant workers from origin (i) to destination (j).

OR = The "oil attraction" variable or oil revenues.

P_i = Population of origin (i).

P_j = Population of destination (j).

D_{ij} = Air miles distance between the capital city in (i) to capital city in (j).

Y_i = The per capita income in the origin (i).

Y_j = The per capita income in the destination (j).

e = The error term

$i = 1 \dots \dots \dots 7$

$j = 1 \dots \dots \dots 9$

Models' Empirical Implications

Multiple regression analysis, which the above models represent, is the analytical framework to be applied to estimate the determinants of labor migration in the Arab region of the Middle East. This method is flexible and lends itself to both cross-section and time series data. In addition, it is adequate for answering many of the questions concerning the magnitudes of determinants of labor migration, their significance, and their policy implications.

Specifically, the empirical analysis of this chapter includes the:

1. Estimation of the determinants of labor migration for LRAS group.
2. Estimation of the determinants of labor migration for each individual labor exporting country.
3. Estimation of the determinants of immigration for ORAS group, and for individual countries.
4. Evaluation of selected policy actions to control migration flows, either by the sending countries or the receiving ones.
5. Testing the hypothesis that Palestinians, due to their displacement as a result of the creation of Israel in 1948, are more mobile than other Arabs.
6. Testing the hypothesis that oil alone can explain the observed pattern of labor migration from LRAS group to ORAS.

Models' Variables and Specifications

Migration Flows. The dependent variable to be explained in the above models (M_{ij}) refers to the total number of workers both male and female from the Arab labor exporting countries (i), and who were actually holding jobs in the ORAS in 1975. It is assumed in this study that over 90 percent of all Arab labor migrants to ORAS actually occurred after 1960.

Migration flows as defined above, raise two problems to be discussed. The first problem is a general one and is concerned with migration studies and the effect of the time period. The second problem is specific to this study and is concerned with the assumption that over 90

percent of all labor migrations occurred after 1960.

With regard to the general problem, empirical studies on migration have used several time periods depending on the quality of the data at hand. Renaud¹ emphasizes three time periods that have frequently been used. One-year intervals, five-year intervals, and life-time migration flows have been used. Greenwood, on the other hand, in a study of internal determinants of migration in Egypt, used the cumulative male migration as reported in the 1960 census data, assuming that over 60 percent of all migration occurred after 1947.²

The problem which arises, apart from the adequacy of the data at hand, is that the longer the time period for which the migratory flows are defined, the greater the probability that the migration flows may influence the independent variables. In this study, however, the assumption is that such influences, which creates simultaneity problems, is minimal. This brings us to the specific problem of this study.

The assumption in this study is that about 90 percent of migration flows from LRAS to ORAS had occurred between 1960 and 1975. This assumption is based on the inspection of the available data on labor migration of the area, and on the facts of oil exports of the ORAS. Three of the countries of the ORAS started their oil exports in the 1960s, Algeria, Libya, and the United Arab Emirates; and Oman in 1970.³

¹Bertrand Renaud, "The Economic Determinants of Internal Migration in Korea," Applied Economics, IX (1977), p. 314.

²Michael J. Greenwood, "The Determinants of Labor Migration in Egypt," Journal of Regional Science, IX (1969), p. 284.

³OPEC, Annual Statistical Bulletin (Vienna, 1977), pp. 3-5.

Although Bahrain, Iraq and Qatar, began their oil exports in the 1940s, they comprise the minor labor importing countries with a share of less than three percent out of the cumulative total of all Arab labor migrants in 1975.⁴

The analysis so far does not include two important labor immigration countries in the ORAS group, namely, Saudi Arabia and Kuwait, whose combined share amounts to about 71 percent of all the cumulative Arab labor immigrants in ORAS up to the end of 1975, and whose commercial oil exports started after World War II. In Kuwait, about 87 percent of the total male migrant population of all ages had been in Kuwait for 14 years or less.⁵ This suggests that 87 percent of all males had either migrated or were born in Kuwait after 1961. With respect to immigrants in Saudi Arabia, her share was about 53 percent of all Arab labor migrants in 1975. Birks and Sinclair estimated that non-national labor migrants in the Kingdom of Saudi Arabia were between 50 and 70 thousand in 1963.⁶ This figure amounts only to 7 to 10 percent of the labor migrant stock in 1975. In other words, this means that about 90 to 93 percent of all labor migrants in Saudi Arabia immigrated after 1963.

The above analysis establishes 1960 to 1975 as a reference period for this study to define the migration flows between the LRAS group and the ORAS group.

⁴J. S. Birks and C. A. Sinclair, International Migration Project: A Summary of Provisional Findings, Empirical Patterns, Past Trends and Future Development (Durham, 1978), p. 13.

⁵Central Statistical Office, Annual Statistical Abstracts 1977 (Kuwait, 1977), p. 63.

⁶J. S. Birks and C. A. Sinclair, The International Migration Project, Country Case Study: The Kingdom of Saudi Arabia (Durham, 1978), p. 13.

Oil Revenue. Oil is the most single important source of revenue for all of the ORAS' governments. As an example, the value of oil exports as a percentage of total exports were 99.9 percent in 1976 for Saudi Arabia; 91.3 percent for Kuwait; 96.8 percent for UAE, 99.9 percent for Libya, and 98.3 percent for Iraq.⁷

Governments in ORAS, as in most developing nations, play a principal role in the process of development. Their budget expenditures, mainly from oil revenues, play the important role in creating employment opportunities and the demand for labor. The private sector in most of these countries creates employment opportunities as well, but it is a reasonable assumption that their ability to create jobs is affected by the atmosphere which may be created by the government economic activities. One would expect the private sector to expand or contract its business activities and the creation of employment opportunities in concurrence with the expansion or contraction of the public sector.

In the "Oil Attraction Model," oil revenue is expected to be positively related to migration flow. Its attractive power will increase migration when it is increased, and will decrease labor migration when oil revenues decrease. However, the fact must be recognized that it is not oil revenue as such which creates demand for migrant labor, it is oil revenues coupled with their use in development expenditure. Here the implied assumption is that all governments in the ORAS group are using the oil revenue for development.

Origin Population (P_i) and Destination Population (P_j). In the absence of international labor migration between countries, the total

⁷OPEC, pp. 3-5.

quantity of labor supplied to an economy depends on (1) the size of the population, (2) the percentage of that population that chooses to be in the labor force, and (3) the hours that labor force participants choose to supply.⁸ Assuming that (2) and (3) are given or constant, then labor supply in the short run without migration or in a closed economy depends on the size of the population.

Relaxing the assumption of closed economy, to an open economy with free labor mobility, we would expect the larger the population size, the larger the emigration of labor would be, given attractive opportunities abroad. On the other hand, the less the population size, the less the emigration would be, given the same or similar attractions abroad. In other words, there would be a positive relationship between the migration flow and the population size in an open economy, once the opportunities abroad are attractive to the migrants.

In this study, the origin population (P_i), represents the low income and the labor abundant group, hence, based upon the above, we expect a positive and direct relationship between the origin population (P_i) and the migration flow (M_{ij}). The implied assumption here with respect to population at the origin is that given the cross-section data, labor in all different LRAS is homogeneous, and hence, only the size of population is different. For example, Egypt has the largest population size in the LRAS group, according to this formulation, she is expected to show a greater number of labor migrants than Jordan, which has a smaller population size.

The above analysis of labor supply, given free mobility of labor,

⁸Don Bellante and Mark Jackson, Labor Economics: Choice in Labor Markets (New York, 1979), p. 48.

suggests that we expect a similar relationship between the population size (P_j) of the destination country and the number of laborers immigrating (M_{ij}) to that country. For example, given that the ORAS group is the rich group with the higher income and better employment opportunities, and has a greater demand expansion for labor, we would expect that these countries would meet their demand for labor from their population plus the labor immigration. Given that this group is homogeneously rich, then migration to this group would be larger to these countries with larger population size. Iraq as an example, or Algeria, whose population size is large, would be expected to have more migrants, while Kuwait or Libya, whose population sizes are relatively smaller, would be expected to have fewer migrants. Thus, the relationship between the migration flow (M_{ij}) and the destination population would be positive.

Income in Origin (Y_i) and Income in Destination (Y_j)

In this study, the "income attraction model" uses the level of per capita income in origin (Y_i); the low-income group, and (Y_j), the destination per capita income in high-income group. Given free choice by workers, one would expect that the higher the income in the destination, ceteris paribus, the larger the number of migrants, and the lower the per capita income in destination, the fewer the number of migrants. Hence, there is an expected direct or positive relationship between the migration flow and the destination income (Y_j).

On the other hand, the origin income (Y_i), is the per capita income of the low-income group. Hence, it is expected that the lower the income, the larger the migration flow to the higher income group or

ORAS. While the higher the income in the origin, the lower the flow of migration. This means a negative relationship is expected between the level of per capita income in the origin (Y_i) and the migration flow (M_{ij}).

Income Ratio (Y_j/Y_i). The investment in the human capital theory assumes that the decision to migrate from one place to another is an individual decision. It postulates that the potential migrant will move if the present value of an expected future income stream in some other place exceeds the present value of the expected income stream in the present place or residence by more than the cost of migration.

In the simplified version of this theory, assuming zero cost, income ratio (Y_j/Y_i), represents an average rate of return. The individual decides to move or stay based upon the value of this ratio. If it is one or less, he stays at his residence, if it is greater than one, then he migrates to (j) destination. This is because if the ratio is one or less, then according to this formulation, he is as well off or better in his place (i) than in place (j). But if the ratio is greater than one, then at least there is a country (j) where he would be better off. Thus, there exists a positive relationship between migration flow and the income ratio (Y_j/Y_i).

Distance D_{ij} . The hypothesis that migration decreases substantially with increased distance, has been attributed to the fact that distance serves as a proxy for both the direct cost of transfer and adjustment, and the psychological costs of movement, as well as for the availability of information, which is assumed to decrease as the

distance moved increases.⁹ Thus, in the above three models we expect an inverse relationship to exist between migration flow (M_{ij}) and distance (D_{ij}).

Population Ratio P_j/P_i . We would expect a positive relationship between the migration flow and the population ratio. The greater the population ratio, the greater the "pull" effect at the destination. In this formulation, it is similar to the income ratio and would show a similar effect.

Data

All variable values refer to the 1975 time period. Migration flows (M_{ij}) are in thousands, and consist of a matrix of seven labor-rich Arab states (LRAS), as the origin of the migrants, and nine labor importing countries (ORAS), as the destination countries. Oil revenues are in billions of dollars, and per capita income is in dollars. Population is presented in hundred thousands. Distance is in air miles distance between the two capitals of the countries of origin and destination. Any changes in the units of data included in the model estimation will be reported with the analysis of that model.

Finally, the sources of data are documented in a separate appendix to this dissertation.

Estimation and Analysis

The analysis of the estimated results is presented in this section,

⁹Michael J. Greenwood, p. 398.

which will be divided into three subsections. The first will be the analysis of the results of the LRAS group and the individual countries of this group. The second will present the results and analysis of the ORAS group, and each country of this group. The final subsection will present the tests of two hypotheses; the displacements of the Palestinians and mobility; and the oil revenue attraction and labor migration.

LRAS Group and Determinants of Migration

The estimation of the parameters of the three models appear in Table X. For each model, the effect of every variable, whether it increases migration or decreases it, is represented by the magnitude and sign of the estimated coefficient. In this estimation the log-linear form to the function is applied, hence, the magnitude of the estimated parameter stands for the elasticity of the variable, and the sign denotes whether a negative or positive relation exists between the independent variable and the migration rate (here, migration rate is used as the dependent variable, and it is equal to the total number of migrants from i to j , divided by the population i).

The general performance of the independent variables in the three models, seems to be good. This is reflected in two ways. The explanatory power of the independent variables, accounts for about 49 percent to 51 percent of the migration rate variation, and the significance level of the estimated coefficients of those variables which range between a one percent level for a number of them such as population in the origin, to ten percent level for variables such as income in the origin. Other variables are significant at a five percent level. Oil revenue, income level, and the income ratio of labor migration have the

TABLE X
ECONOMETRIC RESULTS OF DETERMINANTS OF
LABOR MIGRATION FOR (LRAS) GROUP

Dependent Variable: M_{ij}/P_i					
Form of Equation: Log Linear					
Model	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R^2	Significance
Oil Attraction Model	OR	.8301	2.335	.5059	**
	Y_i	- 1.0421	1.842		***
	P_i	- 1.8080	5.502		*
	P_j	.5960	2.274		**
	D_{ij}	2.3160	2.675		*
	C	-11.963	1.326		C is the Constant
Income Attraction Model	Y_i	- 1.07	1.88	.499	***
	Y_j	.947	2.15		**
	P_i	- 1.801	5.44		*
	P_j	1.305	4.68		*
	D_{ij}	2.088	2.47		**
	C	-16.530	1.56		
Investment in Human Capital Model	Y_j/Y_i	1.073	3.259	.486	*
	P_j/P_i	1.498	7.184		*
	D_{ij}	2.041	2.600		*
	C	-21.319	3.74		

*significant level at 1%

**significant level at 5%

***significant level at 10%

expected "pull" effect on migration and are significant at five percent level or better.

Both distance and population at the origin have unexpected signs, and opposite to the hypothesized relationship. The results show a negative elasticity of population at the origin and a positive elasticity of distance.

With respect to the negative elasticity of population at origin, the result is unexpected, and is in disagreement with the specified labor supply hypothesis. This result suggests that smaller populations supply more migrants than larger populations. The larger populations seem to have less migrants than expected, and the smaller populations have more. This could be explained perhaps by some kind of restrictions on the movement of migrants on countries with large populations such as Egypt, Sudan, and Syria, imposed by government policies either at home or by the host countries. While the countries with smaller populations have less or no restrictions on their movement, either from both governments at home or at destination. The historical evidence shows that Egypt and Syria, for example, had been following a restrictive policy toward emigration of labor during the 1960s. Jordan and the two Yemens, on the other hand, followed a lax policy toward emigration during this period. It could perhaps have been the case that the oil states favor immigrants from countries with smaller populations.

As for the distance effect on migration, the positive and high elasticity is quite unexpected and interesting at the same time. Distance is hypothesized to be negatively related to migration, because it is a proxy for total cost and availability of information.

The fact that the distance variable is positive and significant,

suggests that moving costs are not an important deterrent to migration between the two Arab groups. The high elasticity of distance, 2.3 might suggest that the Arab labor migrant is willing to travel over long distances to capture the opportunities which might be open to him in the oil-rich states. However, this is not a final conclusion. The investigation below shows that this is not the case.

An argument could be made to account for the unexpected sign of distance. This is perhaps due to the specification and definition of the dependent variable (the migration rate), which is defined as the total number of labor migrants from i to j , divided by the population in i .

In the above migration models if larger numbers of migrants happen to come from smaller populations, even if they have the same behavior toward distance, as those migrants who came from larger populations, then the migration rate would show a systematic relation to distance, and this could bias the estimated elasticity of the distance upward. Thus, the above argument suggests that a re-definition of migration rate may reveal the true behavior or response of labor migrants towards distance.

With regard to this problem and with reference to the problems associated with the choice of the dependent variable for cross-section studies of migration, Geoffrey Young points out that

The difficulty with any procedure which does not correctly allow for the effect of population size arises from the fact that the economic characteristics--the income, urbanization, education levels, or remoteness--of the political divisions of a country may be correlated with their populations.¹⁰

¹⁰ Geoffrey Young, "Choice of Dependent Variable for Cross-Section Studies of Migration." Canadian Journal of Economics, VIII (1975), p. 49.

The author goes on to say that the choice of the dependent variable for cross-section analyses of the determinants of interregional migration requires that some allowance be made for varying region populations. He points out that some of the normalization that has been used in empirical studies of migration may bias the estimated coefficients of explanatory variables correlated with population size. The following normalization procedure, which avoids the above biasedness is then suggested:

$$\text{Normalized Variable} = M_{ij}P_i/P_j$$

where (P) is total population and other variables are as defined before. This variable could be thought of as a "migration parameter," for migration from a small place to another areas, as the proportion of the population of the sending place which would migrate to the receiving area if the population of the latter were equal to that of the entire country. In cases where wide variations in a region's population exist, it is appropriate to make a correction for heteroskedasticity (when the error terms are not independently distributed with zero mean and constant variance, as the classical least-squares method assumes).¹¹ For example, the variance of labor migrants among countries with large populations, may be greater than the variance among small countries with small populations. Regressions using the above suggested "migration parameter" as a dependent variable instead of the migration rate, and a correction for the heteroskedasticity were estimated for the three specified models. Though the correct specification for the cause of heteroskedasticity is not known, it is specified here that countries of the ORAS group with smaller populations have less variation in their

¹¹Ibid., p. 97.

immigrants than the countries with larger populations.

The re-estimated models are shown in Table XI. However, before starting a detailed analysis of the findings, two observations about the new estimation are in order. The first is concerned with the explanatory power of the re-estimated models which it has increased for two models, the "oil attraction model" from 50.5 percent to 54.8 percent, and for the "income attraction model" from 49.9 percent to 63 percent; but decreased for the "investment in human capital model" from 48.6 percent to 33.6 percent. The second observation, is that the sign of the distance coefficient has changed to a negative sign and is statistically significant in all three models. Therefore, the above observations show that the new procedure yields better results than the previous one.

Further evidence also shows that the new procedure is perhaps more correct. This evidence is shown by a third estimation of the models where only the migration flow (M_{ij}) is used as a dependent variable, i.e. without any normalization. The significance of not including the population variable in the left-hand side of the migration function is to reduce the correlation between population and the explanatory variables in the right-hand side to zero, and, thus, insure against any bias in the estimated coefficients due to this correlation.

The results of this estimation appear in Table XII. Distance elasticity in this estimation is negative and significant at five percent level or better in the three models. This is in accordance with the results obtained earlier, using the "migration parameter" as a dependent variable.

TABLE XI
 THE MIGRATION PARAMETER
 DEPENDENT VARIABLE:
 $\frac{M_{ij}\Sigma P_j}{P_i P_j P_j}$

Model	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance
Oil Attraction	OR/Pj	1.14	5.09	.548	*
	Yi/Pj	-.0047	.013		
	Pi/Pj	-.45	2.19		**
	Pj/Pj	13.4	2.35		**
	Dij/Pj	-1.86	3.41		*
	C/Pj	2.76	3.77		
Income Attraction Model	Yi/Pj	-.016	.05	.63	
	Yj/Pj	1.67	6.69		*
	Pi/Pj	-.45	2.41		**
	Pj/Pj	1.34	.22		
	Dij/Pj	-1.96	4.10		*
	C/Pj	.077	.09		
Investment in Human Capital Model	Yj/YiPj	1.39	5.83	.336	*
	Pj/PiPj	.28	1.21		
	Dij/Pj	-.52	1.59		***
	C/Pj	-1.58	4.31		

*significant level at 1%
 **significant level at 5%
 ***significant level at 10%

It should be noted that the inclusion of a dummy variable (DUM) in the form of 1 = Jordan, and 0 = otherwise, resulted in a significant dummy at 20 percent level and a slight change in the estimates of the parameters. For example, the result of the "oil attraction model" is

$$\ln\left(\frac{M_{ij}\Sigma P_j}{P_i P_j P_j}\right) = 1.58 \ln(C/P_j) + 1.14 \ln(OR_j)^* - .02 \ln(Y_i/P_j) - .42 \ln(P_i/P_j)^{**} \\ - 1.90 \ln(D_{ij}/P_j)^* + .45 \text{DUM} \ln(P_i/P_j) \quad R^2 = .56$$

and for the "income attraction model" is

$$\ln\left(\frac{M_{ij}\Sigma P_j}{P_i P_j P_j}\right) = .03 \ln(C/P_j) - .03 \ln(Y_i/P_j) + 1.66(Y_j/P_j)^* - .42 \ln(P_i/P_j)^{**} \\ + .03 \ln(P_i/P_j) - 1.99 \ln(D_{ij}/P_j)^* + .45 \text{DUM} \ln(P_i/P_j) \quad R^2 = .64$$

TABLE XII

ECONOMETRIC RESULTS OF DETERMINANTS OF
LABOR MIGRATION FOR (LRAS) GROUP
DEPENDENT VARIABLE: M_{ij} "Flow"

Form of Equation: Log Linear		n=63			
Model	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance
Oil Attraction Model	OR	1.081	5.63	.50	*
	Y _i	-.299	.982		
	P _i	.151	.852		
	P _j	-.226	1.59		
	D _{ij}	-.946	2.02		
	C	.941	.19		
Income Attraction Model	Y _i	-.317	1.128	.57	*
	Y _j	1.498	6.88		
	P _i	.154	.947		
	P _j	.799	5.80		
	D _{ij}	-1.081	2.59		
	C	-9.20	1.76		
Investment in Human Capital Model	Y _j /Y _i	.931	4.89	.40	*
	P _j /P _i	.367	3.04		
	D _{ij}	-1.39	3.07		
	C	9.16	2.78		

*significant level at 1%

**significant level at 5%

From the above, it seems plausible to assume that the results obtained with positive distance elasticity and negative elasticity of population at origin are not valid (when migration rate is the dependent variable), rather, the results which give positive elasticity (when the dependent variable is the migration flow or the "migration parameter" of both variables are more reasonable.

In order to show the effect and magnitude of the determinants of migration between the labor-rich Arab group and the oil-rich Arab group, elasticities of the determinants of migration (the explanatory variables) are derived from the estimated models with respect to the migration flow (M_{ij}). Elasticities are quite useful in this respect, since they show the effect of a percentage change of the independent variables on the dependent variable. In general, large elasticities imply that the dependent variable is very responsive to changes in the independent variable. The derived elasticities appear in Table XIII.

In this table three elasticities are shown for each independent variable. These elasticities are derived from the estimated models using three definitions of the dependent variable, namely, (1) the "migration parameter;" (2) the migration flow; and (3) the migration rate. Although the analysis will emphasize only the results based on the estimated models using the "migration parameter," it is observed that the elasticities of this later estimation appear generally to be higher than the elasticities of the other two estimations.

The table shows that both oil revenues and income have positive elasticities, and denote strong "pull" effect to migration flows. However, the income elasticity of migration appears to be higher than the oil revenue elasticity. For example, the income elasticity of the

TABLE XIII
ELASTICITIES OF MIGRATION BETWEEN
LABOR-RICH ARAB STATES AND
OIL-RICH ARAB STATES

		(1)	Elasticity (2)	(3)
Oil Attraction Model	OR	1.14*	1.08*	.83**
	Y _i	- .004	- .29	-1.04***
	P _i	.55**	.15	- .80*
	P _j	1.42**	- .22	.59**
	D _{ij}	-1.86*	- .94**	2.3*
Income Attraction Model	Y _i	- .02	- .31	-1.07***
	Y _j	1.67*	1.49*	.947**
	P _i	.55**	.15	- .80*
	P _j	2.69*	.79*	1.30*
	D _{ij}	-1.96*	-1.08*	2.08*
Investment in Human Capital Model	Y _i	-1.39*	- .93*	-1.07*
	Y _j	1.39*	.93*	1.07*
	P _i	.72	- .36*	- .49*
	P _j	1.43*	.36	1.49*
	D _{ij}	- .52***	-1.39*	2.04**

*significant level at 1%

**significant level at 5%

***significant level at 10%

Elasticities are derived from the estimated models with the dependent variable (1) as "the migration parameter;" (2) the migration flow; and (3) "the migration rate."

Since the estimated relationships are of log linear form, the parameter estimates of the variables are the elasticities. Suppose the model is

$$\frac{M_{ij}}{P_i P_j} = A P_i^{b_1} P_j^{b_2} D_{ij}^{b_3} e$$

Then

$$\ln M_{ij} - \ln P_i - \ln P_j = \ln A + b_1 \ln P_i + b_2 \ln P_j + b_3 \ln D_{ij} + \ln e$$

$$\text{or } \ln M_{ij} = \ln A + (1+b_1) \ln P_i + (1+b_2) \ln P_j + b_3 \ln D_{ij} + \ln e$$

The origin population elasticity of migration is

$$\frac{\partial \ln M_{ij}}{\partial \ln P_i} = (1 + b_1)$$

and distance elasticity of migration is $\frac{\partial \ln M_{ij}}{\partial \ln D_{ij}} = b_3$

"income attraction model" is 1.67 as against 1.14 in the "oil attraction model." This suggests that a ten percent increase in per capita income of the ORAS. *ceteris paribus*, may increase migration flows by 16.7 percent; while similar increases in the oil revenues would increase migration by 11.4 percent. These results may indicate that migrant's response to income is larger than the mere wealth of the oil states.

Both populations at the origin and at destination elasticities are positive, but the elasticity of the latter, is much higher (it ranges between 1.42-2.69 in the three models) than the former population (it is .55 in two models). These elasticities could be interpreted that large populations at the origin supply have proportionately fewer migrants, while large populations at destination countries attract proportionately more.

Distance elasticity is shown to be negative in the three models and ranges between -.52 to -1.96. This result indicates that distance has a dampening effect on migration. This could suggest that either costs (psychological and financial) or lack of information are important deterrents to migration between the two Arab groups. The high elasticity of distance indicates that migrants prefer to travel to the nearer states rather than to the farther states.

Finally, income at the origin elasticity has a negative sign in the three models, but is only significant in the "investment in human capital model." This elasticity indicates that income at the origin acts as a "push" factor to migration. The larger the differential of income between the ORAS group and LRAS group, the higher the migration flow from LRAS to the ORAS group.

In summary, the above analysis of the effects of determinants of migration as reflected by their elasticities reveal that oil revenues,

income level at destination and the income ratio are important determinants of migration between the two Arab groups. The analysis shows also that both populations at the origin and at the destination are positively affecting the migration flow between the two groups.

On the other hand, distance is found to have a negative effect on the migration flows. This could reflect that high costs or lack of information are factors which could make migration flows to the farther states less than to the nearer states.

The theoretical implications of the classical theory of factor mobility, which predicts that migration from low-income places to high-income places, or from the low growth countries to the high growth and expanding countries, seems to be empirically supported by the findings of these models. The level of income in the origin country has a dampening effect or "push" factor, while the income level at destination has a "pull" effect on the migrants. Aside from the social costs which migration may cause on origin and destination countries, and which are not considered in this study, one would come to the conclusion that the present pattern of the migration flows between the two groups is in the right direction, and constitutes an efficient process of resource transfer and reallocation of labor from lower income states in the LRAS group to high income states in the ORAS group.

Individual LRAS Determinants of

Migration

Since the labor-rich Arab states vary in their characteristics, it is likely that the factors that influence migration from each individual country will differ in importance. For example, differences in income

level, education, and population may result in migration elasticities that differ markedly for each country. This would have important policy implications and prescriptions which could be drawn for each country separately.

In this section of the present study, we consider each country as an origin, and analyze the determinants of the migration flows from each country of the ORAS. This procedure results in separate estimates for Jordan, Egypt, Syria, Lebanon, the two Yemens, and Sudan.

The two models employed for individual countries are the "investment in human capital model" and the "oil attraction model." These two models are basically the same as were employed for the LRAS as a group. However, there are two exceptions specified here. First, in the "investment in human capital model," the dependent variable is deflated in two ways; one by the population of the origin i , and another by the total labor migrant. Second, instead of the population level, as independent variables in the "oil attraction model," the ratio of population (P_j/P_i) is used.

The results for both models appear in Tables XIV, XV, and XVI below, and the analysis of the estimated relation would follow in the same order. Table XIV contains the estimated relations of LRAS as a group and of each individual sending country. The dependent variable of these relations is the migration flows deflated by the total labor migrant. The parameters were estimated by least-squares and log-linear relationships were fitted.

The explanatory power of the regression for LRAS group is reasonably good and the variables explain 40 percent of changes in the migration flows. All the coefficients are significant at a one percent level, and

TABLE XIV

MODEL: INVESTMENT IN HUMAN CAPITAL

Dependent Variable: $M_{ij}/1.158$					
Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R^2	Significance Level
LRAS				.40	
	Yj/Yi	.93	4.91		*
	Pj/Pi	.38	3.17		*
	Di _j	- 1.32	2.94		*
	C	8.59	2.6		
Jordan				.846	
	Yj/Yi	1.98	4.55		*
	Pj/Pi	.76	2.66		**
	Di _j	- 1.13	1.32		
	C	5.75	.925		
Egypt				.588	
	Yj/Yi	1.46	1.94		***
	Pj/Pi	.68	1.31		
	Di _j	- 1.45	.66		
	C	10.43	.66		
Syria				.75	
	Yj/Yi	2.11	3.85		*
	Pj/Pi	.90	2.47		**
	Di _j	1.26	1.19		
	C	-10.68	1.42		
Lebanon				.838	
	Yj/Yi	1.15	4.21		*
	Pj/Pi	1.10	4.49		*
	Di _j	- .05	.07		
	C	- .37	.06		
North Yemen				.83	
	Yj/Yi	.92	2.70		**
	Pj/Pi	.78	3.71		*
	Di _j	- 1.90	2.49		**
	C	11.64	1.93		
South Yemen				.82	
	Yj/Yi	.97	2.13		***
	Pj/Pi	1.01	3.53		*
	Di _j	- 2.55	3.06		*
	C	17.27	2.64		

TABLE XIV (Continued)

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance Level
Sudan	Y _j /Y _i	1.33	1.85	.575	***
	P _j /P _i	.85	1.95		
	D _{ij}	- .51	.35		
	C	- 1.99	.17		

*significant level at 1 %

**significant level at 5%

***significant level at 10%

"Chow test" was applied to see if the difference between the estimated coefficients (elasticities) for the individual countries is not statistically significant; and the conclusion of the test at one percent level was the rejection of the null hypothesis (equality of the coefficients), and the acceptance of the alternative hypothesis, i.e., the difference in the estimated elasticities is significant.

have the expected signs.

The elasticities for the income ratio and population ratio are positive and equal .93 and .38 respectively. It is appropriate to note that these ratios can be interpreted as a difference between two logarithms. Hence, the greater the differential in per capita income between the destination (j) and origin (i), ceteris paribus, the greater the expected rate of migration between i and j. Similar interpretations could be applied to the population ratio, and the result would be that the greater the difference between the destination and origin populations, the greater would be the migration flow from i to j.

Thus, the resultant elasticity of income ratio for the LRAS group suggests that an increase of one percent in income differential would encourage migration by .93 percent. Similar percentage increase in the population differential would encourage migration by .38 percent.

The fact that the distance elasticity is negative and significant suggests that moving costs or availability of information are important deterrents to migration between the LRAS and the ORAS. The magnitude of the distance elasticity of negative 1.32 indicates that a one percent increase in the distance between origin and destination results in a 1.32 percent decrease in migration from the sending country to the receiving country.

The individual country results show a markedly high elasticity and high explanatory power as compared to the LRAS group. For example, the individual country's average of income ratio elasticity and R^2 is 1.41, and .79 respectively, compared to .93 and .40 for the group. Income and population ratios are significant in all regressions at ten percent or better, except in two cases; the population ratio fails to be significant in the Egyptian case, and the income ratio fails to be significant

in the Sudanese case. In both cases, the variables have the expected sign. Distance fails to be significant at ten percent level in five individual regressions.

The estimated results for Jordan show the highest explanatory power among the group with approximately 85 percent of the variation in the migration rate accounted for by income and population ratios and distance. The income ratio elasticity for Jordan is well above the average of the group and equals 1.98.

Tables XV and XVI contain the estimated results of the "investment in human capital model" and "oil attraction model," respectively. The dependent variable in these estimates, the migration flow is deflated by the origin population. The average R^2 for individual countries of the investment in the "human capital model" is about .69. This is higher than the average of the "oil attraction model" which is equal to .60. Income ratio in the first model and oil revenues in the second model have the correct sign for all countries except for South Yemen. The population ratio variable in the first model is positive, except for Lebanon; but insignificant for most countries except for Jordan, Syria, and South Yemen, where it is significant at the ten percent level or better. The same population ratio in the "oil attraction model" shows in three cases a negative relation with migration rate, but only significant at five percent level for the Jordan case. This may suggest that Jordan's emigrants are attracted to the countries of the ORAS with small population, rather than countries with high populations. Distance is insignificant in both models except for Lebanon, though with a positive elasticity.

In summary, the above estimates suggest that the best results for individual countries are obtained when the migration rate is deflated by

TABLE XV

MODEL: INVESTMENT IN HUMAN CAPITAL
DEPENDENT VARIABLE: M_{ij}/P_i

Form of Equation: Log Linear					
Observation: No. :9					
Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R^2	Significance Level
Jordan				.846	
	Yj/Yi	1.985	4.554		*
	Pj/Pi	.767	2.669		**
	Dij	- 1.139	1.329		X
	C	- 1.995	.320		
Egypt				.588	
	Yj/Yi	1.465	1.949		***
	Pj/Pi	.683	1.316		X
	Dij	- 1.452	.663		X
	C	.0534	.003		
Syria				.75	
	Yj/Yi	2.115	3.858		*
	Pj/Pi	.902	2.477		**
	Dij	1.268	1.196		
	C	-19.45	2.599		
Lebanon				.678	
	Yj/Yi	- .339	.30		
	Pj/Pi	1.329	1.737		X
	Dij	5.83	2.39		X
	C	-44.74	2.6		
North Yemen				.85	
	Yj/Yi	.628	.691		X
	Pj/Pi	2.251	3.934		***
	Dij	1.94	1.17		X
	C	-17.54	1.349		
South Yemen				.69	
	Yj/Yi	- .8968	.802		X
	Pj/Pi	1.026	1.489		X
	Dij	1.442	.579		X
	C	-10.724	.54	X	

TABLE XV (Continued)

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance Level
Sudan	Y _j /Y _i	.838	.48	.44	X
	P _j /P _i	1.825	1.723		X
	D _{ij}	2.098	.588		X
	C	-21.98	.787		

*significant level at 1%

**significant level at 5%

***significant level at 10%

X not significant at 10%

TABLE XVI
OIL ATTRACTION MODEL--RESULTS OF
INDIVIDUAL COUNTRIES OF LRAS

Dependent Variable: M_{ij}/P_i					
Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R^2	Significance Level
Jordan	OR	1.60	4.54	.846	*
	P_j/P_i	-.64	2.5		**
	D_{ij}	-.80	.91		
	C	-13.95	1.8		
Egypt	OR	1.01	1.57	.51	
	P_j/P_i	-.31	.70		
	D_{ij}	-1.62	.67		
	C	-6.14	.30		
Lebanon	OR	.18	.20	.675	
	P_j/P_i	1.40	2.09		***
	D_{ij}	6.15	2.47		**
	C	-48.97	2.34		
Syria	OR	1.56	2.97	.64	
	P_j/P_i	-.54	1.40		
	D_{ij}	1.50	1.16		
	C	-32.61	2.90		
North Yemen	OR	.60	.80	.85	
	P_j/P_i	1.17	2.60		**
	D_{ij}	2.22	1.26		
	C	-23.35	1.37		
South Yemen	OR	-.12	.12	.65	
	P_j/P_i	1.31	1.37		
	D_{ij}	2.14	1.37		
	C	-17.39	.65		

*significant level at 1%
**significant level at 5%
***significant level at 10%

TABLE XVI (Continued)

Country	Independent Variable	Estimated Coefficient	Absolute t-ratio	R ²	Significance Level
Sudan	OR	.03	.02	.41	
	Pj/Pi	1.47	1.48		
	Dij	1.26	.31		
	C	-14.66	.37		

the total labor migrant, and not by the total population.

Estimation of the Supply of Labor

Immigrants into ORAS Group and

Individual ORAS

This section presents an estimate of the supply of labor immigrants from LRAS into the ORAS, in two forms. First, an estimate of supply of immigrants in ORAS as a group, and secondly, into individual labor importing states. The purpose of these estimates is to analyze the determinants of labor immigration into these countries as a group and as individual states.

The variables which are used in these estimates are the same variables which are used to estimate the labor emigration determinants from LRAS to ORAS. However, the form of migration flow and distance are now adjusted to M_{ji} and D_{ji} . The migration flows (M_{ji}), now reflect the immigrants into county j , from the sending country i . And D_{ji} , reflects the distance between the country of destination j and origin i .

Table XVII contains the estimated relations for the ORAS as a group and for individual states. The table shows two estimates for the ORAS group. The first using the variables of income ratio, population ratio and distance, this is previously termed the investment in the "human capital model." The second using the same variables, except that oil revenues is substituted for the income ratio, this is previously termed the "oil attraction model." The estimates for the individual countries use only the simple version of the investments in the human capital model. The analysis of the estimated results begins with the ORAS group, followed by the individual results.

TABLE XVII
 THE ESTIMATED PARAMETERS FOR
 THE ORAS GROUP

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance Level
Dependent Variable: M_{ji}/P_i					
Form of Equation: Log Linear					
Observations: 63 for the Group; 7 for Individual Countries					
Group				.549	
	Yj/Yi	1.066	5.904		*
	Pj/Pi	.8413	7.33		*
	Dji	- 1.039	2.414		**
	C	5.345	1.711		
Group				.41	
	OR	.7434	3.61		*
	Pj/Pi	.3012	2.399		**
	Dji	- .84	1.63		***
	C	- .36	.08		
Saudi Arabia				.722	
	Yj/Yi	.6003	.5449		X
	Pj/Pi	1.161	2.555		***
	Dji	- 2.284	.604		X
	C	15.805	.578		
Libya				.875	
	Yj/Yi	1.304	2.573		***
	Pj/Pi	.417	1.811		X
	Dji	- 4.141	4.323		**
	C	28.153	4.522		
UAE				.69	
	Yj/Yi	- .32	.36		X
	Pj/Pi	.71	.88		X
	Dji	- 1.89	.42		X
	C	16.12	.49		
Qatar				.62	
	Yj/Yi	.277	.30		X
	Pj/Pi	.925	1.28		X
	Dji	- 1.52	.35		X
	C	11.33	.38		
Bahrain				.93	
	Yj/Yi	1.65	4.78		*
	Pj/Pi	.95	3.89		**
	Dji	- 1.43	1.14		X
	C	6.82	.82		

TABLE XVII (Continued)

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance Level
Oman	Yj/Yi	- .66	.54	.60	X
	Pj/Pi	.84	.94		X
	Dji	- 1.38	.26		X
	C	11.51	.30		
Iraq	Yj/Yi	2.70	1.10	.58	X
	Pj/Pi	1.4	1.97		X
	Dji	- 2.96	1.02		X
	C	14.49	.86		
Algeria	Yj/Yi	- 1.30	.82	.63	X
	Pj/Pi	- .09	.11		X
	Dji	6.89	1.51		X
	C	-52.8	1.59		
Kuwait	Yj/Yi	1.53	1.35	.809	
	Pj/Pi	.80	1.80		
	Dji	- 7.62	2.42		***
	C	48.79	2.62		

*significant level at 1%

**significant level at 5%

***significant level at 10%

X-not significant at 10%

The two estimates for ORAS show that income and population ratios, oil revenues, and distance are important determinants of labor immigration into ORAS. This is reflected in the significance levels of these variables, and the explanatory power of the independent variables of migration variation. However, the investment in the "human capital model" shows better results than the "oil attraction model." The independent variables explain 54 percent of the change in migration in the first model, as against 41 percent in the second model. Also, though, income and population ratios, in both models are positively affecting migration, they differ markedly in their estimated elasticities. For example, the income ratio elasticity is higher than the oil elasticity. The estimated elasticities for these variables suggest that an increase in income ratio or oil revenues, by ten percent, ceteris paribus, would increase migration by 10.6 percent in the first model, against 7.4 percent in the second model. This result could be interpreted that labor immigration between the two groups in the Arab world is more responsive to income differences, than the mere existence of oil wealth.

Population ratio in both models, also reflect a positive effect on migration, but the elasticity in the first model is greater than the second model. Distance in both models, seems to affect negatively the migration between the two groups. The negative distance elasticity suggests that more migrants prefer to travel to nearer states than to far away states.

The results of supply of immigrants of individual countries show in general, that income and population differentials and distance have the expected signs in the supply function of immigrants, though, statistically insignificant. This is shown in the correct sign of these variables

and their high explanatory power of the changes in the migration rate. For example, the variables on the average explain about 72 percent of the migration rate variations, with a range between the lowest and highest explanatory power from 58 percent to 93 percent. The income differentials variable has a positive effect on migration as expected for six countries, but with a wrong sign for three countries, namely Algeria, Oman, and the UAE. Population ratio has also the correct sign for eight countries, and a wrong sign for only Algeria. Distance on the other hand, reflects an expected negative elasticity for eight countries, and a wrong sign for Algeria.

The Displacement of Palestinians and Mobility

A result of the creation of Israel in 1948 was the displacement of approximately one million Palestinians from their homes, and more important, the land which represented their major economic base.¹² The majority of the refugees had found resettlement in Jordan and the Gaza Strip. The 1967 Arab-Israeli War caused more Jordanians and Palestinians to relocate in the East Bank of Jordan. Estimates put their figure around 182,000 to 200,000.¹³ The majority of the 1967 group were those who lived on the Gaza Strip and the West Bank of Jordan.

It can be hypothesized that these two major incidents are responsible both directly and indirectly for the large number of labor migrants from the Jordanians and Palestinians to the ORAS group. The

¹²Keessing's Contemporary Archives, July 9-16, 1949 (London, 1949), P. 1010.

¹³Europa Publications, The Middle East and North Africa 1969/70 (London, 1970), p. 93.

direct effect results from the creation of a great number of unemployed as a result of the displacements coupled with the inability of the Jordanian economy to absorb all of them. This made it imperative for many to look for jobs elsewhere, particularly in the ORAS region. The indirect effect is a result of the loss of their capital and land properties, which made the Palestinians more aware of the importance of developing their human resources by seeking versatile education, and selecting mobile educationally based professions. Such investments in human capital, enable them to acquire and hold gainful employment in Jordan or elsewhere because of the exportability of human capital.

The Jordanians and the Palestinians account for about 23 percent of the total labor migrants in the ORAS group. This is the third largest proportion among all the Arab labor migrants for individual countries. Table XVIII shows that Egypt comes first, with 33.9 percent followed by North Yemen with 25.1 percent. However, the Jordanians and Palestinians rank first in terms of migration rate. Table XVIII shows that the migration rate for Jordanians and Palestinians is 98.5 thousands per million of population. The second rank is far behind with only 54 thousand per million, and it is for North Yemen. Egypt and Sudan who rank at the top in total population with first and second respectively, rank at the bottom with respect to migration rate, holding the sixth and seventh places respectively.

The above analysis shows that Jordan's (including Palestine's) migration rate per population comes first in rank, and this would suggest the inclusion of a dummy variable to test the hypothesis whether the presence of the Arab-Israeli conflict and the displacement of Palestinians had contributed to their increased labor mobility.

TABLE XVIII

DISTRIBUTION OF THE ARAB LABOR MIGRANTS
IN THE ORAS GROUP AND RELATIVE SHARE
IN PERCENT AND RATE PER MILLION

Country	Total(000) Migrants	Percent %	Population Million	Migration Rate Thou./Million
Jordan	266	22.9	2.7	98.58
Egypt	392.2	33.9	37.2	10.54
Syria	52.6	4.5	7.4	11.55
Lebanon	41.0	3.5	3.1	13.2
North Yemen	190.7	25.1	5.3	54.8
South Yemen	70.6	6.19	1.7	41.5
Sudan	45.6	3.9	15.7	2.9

Furthermore, the result in the above model is clearly consistent with the hypothesis that the existence of the Arab-Israeli conflict and the resultant displacement of Palestinians from their land and the loss of their income base, had contributed to their increased mobility. The coefficient of the dummy variable has a positive sign as expected and is significant at a one percent level. The magnitude of the coefficient of the dummy variable in presence of the Palestinian problem is .156, and this increases the response of the population mobility for the Jordanians from .29 to about .45. This is a considerable increase in the original response and 34 percent of the total effect of population on migration. For example, the results suggest that a ten percent increase in the population of the origin would have an effect of 4.5 percent increase in migration flow; while in absence of the conflict it would only increase by 2.9 percent.

The inclusion of the dummy variable in the above migration function is formulated on the assumption that the Arab-Israeli conflict and the displacement of the Palestinians has altered their marginal propensity to migrate. However, another formulation of the dummy variable, is made below. This formulation is based on the hypothesis that the displacement of the Palestinians (the majority resettled in Jordan) has affected the average propensity of the Jordanian migration (altered the intercept of the migration function). For testing this hypothesis, a dummy variable which has a value of 1 = Jordan; and 0 = Otherwise, is added to the migration function.

The results, testing this hypothesis, are reported below:

$$M_{ij} = -11.05 + 1.23D_{um} + 1.51Y_j - .36Y_i - .99D_{1j} + .80P_j + .29P_i$$

Absolute t-ratio (2.21) (2.7) (7.3) (1.3) (2.5) (6.1) (1.77)

* * ** * ***

$R^2 = .62$

The above results show that the coefficient of the dummy variable is significant at the one percent level and positive. This means that the result supports the hypothesis that the Arab-Israeli conflict and the displacement of the Palestinians had contributed to their observed mobility.

Oil Revenues and the Pattern of Labor Migration

A hypothesis can be advanced that oil revenues accruing to ORAS could explain the observed pattern of labor migration from the LRAS to ORAS. The explicit assumption is that oil revenues approximate the domestic labor absorptive capacity for ORAS group as the maximum level of government expenditure consistent with government objectives and subject to the constraints of oil revenues. Immigration of labor would then occur to augment the endogenous labor force required to carry the development plans in the ORAS group. The analysis then would suggest that the more the oil revenues in the ORAS, the more the immigration of labor would be, and the less the oil revenues the less the immigration of labor would be.

A migration function relating the migration flows to oil revenues and distance is estimated below. Distance is included in the model to account for total cost which could affect the decision of migrants in their choice of destination. The results appear in Table XIX which includes an estimation for the LRAS group, as well as the results for

TABLE XIX
 DEPENDENT VARIABLE: M_{ij}
 OBSERVATIONS: 63

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R^2	Significance Level
<u>Log-Linear</u>					
Group				.456	
	OR	.9285	5.73		*
	D _{ij}	- 1.0026	2.2537		*
	C	.4655	.1235		
<u>Linear Form</u> Observations: 9					
Jordan				.91	
	OR	.0072	7.37		*
	D _{ij}	.002	.116		X
	C	-19.66	.841		
Egypt				.14	
	OR	.0014	.293		X
	D _{ij}	- .063	.58		X
	C	109.02	.76		
Syria				.33	
	OR	.0005	1.56		X
	D _{ij}	.0007	.119		X
	C	3.188	.399		X
Lebanon				.91	
	OR	.00079	7.298		*
	D _{ij}	- .00099	.472		X
	C	.5118	.183		
North Yemen				.91	
	OR	.0114	7.345		*
	D _{ij}	.0088	.556		X
	C	30.911	1.107		
South Yemen				.926	
	OR	.00219	7.898		*
	D _{ij}	- .00258	.887		X
	C	- 2.938	.563		

TABLE XIX (Continued)

Country	Independent Variable	Estimated Coefficient	Absolute t-Ratio	R ²	Significance Level
Sudan	OR	.00158	5.819	.91	*
	Dij	.00286	.720		X
	C	- 9.819	1.251		

*significant level at 1%
X-not significant at 10%
C stands for the Constant.

each individual country in the group.

The estimated results of the model for both LRAS group and the individual country seem to support the hypothesis that oil revenues explain well the observed pattern of migration between the LRAS and ORAS.

At the country level, a linear form of the model was fitted. Oil revenues coefficient has the expected sign, and is highly significant at better than the one percent level for five countries out of seven. Only for Egypt and Syria did the oil variable fail to be significant at a ten percent level, although it has the expected sign.

Distance in this model does not seem to be important for individual countries' emigrants. It is insignificant for all and has a wrong sign for Jordan, North Yemen, and Sudan.

At the group level however, both oil revenues and distance are two important variables and explain about 46 percent of migration flows, and both variables are significant at a one percent level. Oil elasticity of migration flow is positive .928. A ten percent increase in the oil revenues will bring about a 9.3 percent increase in migration flows from the LRAS group. However, distance is inversely related to migration. This is compatible with two different interpretations. The first could be that the nearer the ORAS countries to the LRAS, the greater their labor absorptive capacity, and the greater the immigration to them. The second is that migrants prefer to travel to the nearer states than to the farther states. This behavior could reflect that cost of migration and adjustment are greater the longer the distance traveled, and/or that information decreases appreciably the longer the distance. Also, better information can be obtained the nearer the states. If this is the case, then a policy to increase information about the

distant states from LRAS, or a subsidized travel cost would greatly enhance the mobility of labor in the region, especially in those countries which suffer from high unemployment or underemployment.

CHAPTER V

CONSEQUENCES OF THE LABOR EMIGRATION FOR THE JORDANIAN ECONOMY

In order to analyze the effects of the labor migration on the Jordanian economy, a macro-model is designed to analyze the effects of workers' remittances on the macro-economic variables. Specifically the objective of the macro-model is three-fold: (1) to investigate the impact of remittances on the Jordanian National Income and the Balance of Payments; (2) to analyze the effects of changing circumstances in the level of remittances on the Jordanian economy; and (3) to analyze alternative policy targets such as controlling emigration or encouraging it.

A Macro-model for the Jordanian Economy

The model utilizes the Keynesian framework for the determination of income. It is a simple demand-oriented model designed to estimate the various multipliers including the multipliers for remittances, government expenditure, foreign aid, exports and imports.

The variables, the parameters, and the equations of the model are defined as follows:

Endogenous Variables

- C Total private consumption expenditure
- I Total investment expenditure

M	Total imports of goods and services
GNI	Gross National Income net of foreign aid
Y	Gross national income
B	Balance on current account (Basic Balance)

Exogenous Variables

G	Total government expenditure
X	Total exports of goods and services
R	Remittance of workers abroad
F	Foreign aid

Parameters

c_0	Autonomous consumption
c	Marginal propensity to consume (mpc)
m_0	Autonomous imports
m	Marginal propensity to import (mpm)
i_0	Autonomous investment
i	Marginal propensity to invest (mpi)
e	Disturbance term

Equations and Identities

- (1) $C = c_0 + c(\text{GNI}) + e$
- (2) $M = m_0 + mY + e$
- (3) $I = i_0 + iY + e$
- (4) $\text{GNI} = Y - F$
- (5) $Y = C + I + G + X + R + F - M$
- (6) $B = X + R + F - M$

The National Income Multipliers

$$(7) \quad \frac{\partial Y}{\partial G} = \frac{\partial Y}{\partial R} = \frac{\partial Y}{\partial X} = \frac{\partial Y}{\partial c_0} = \frac{1}{1 - c - i + m}$$

$$(8) \quad \frac{\partial Y}{\partial F} = \frac{1 - c}{1 - c - i + m}$$

$$(9) \quad \frac{\partial Y}{\partial m_0} = \frac{-1}{1 - c - i + m}$$

The Balance of Payments Multipliers

$$(10) \quad \frac{\partial B}{\partial X} = \frac{\partial B}{\partial R} = \frac{1 - c - i}{1 - c - i + m}$$

$$(11) \quad \frac{\partial B}{\partial m_0} = - \frac{(1 - c - i)}{1 - c - i + m}$$

$$(12) \quad \frac{\partial B}{\partial F} = \frac{1 - c - i + mc}{1 - c - i + m}$$

The Reduced Form Equations

$$(13) \quad C = f(G, X, R, F, e)$$

$$(14) \quad M = f(G, X, R, F, e)$$

$$(15) \quad I = f(G, X, R, F, e)$$

$$(16) \quad Y = f(G, X, R, F, e)$$

$$(17) \quad B = f(G, X, R, F, e)$$

The Reduced Form Equations: Matrix Form

$$AZ = D$$

where

$$A = \begin{bmatrix} 0 & 0 & 1 & 0 & 0 & -c \\ -m & 0 & 0 & 1 & 0 & 0 \\ -i & 0 & 0 & 0 & 1 & 0 \\ -1 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 1 & 1 & -1 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 \end{bmatrix}$$

$$Z = \begin{bmatrix} Y \\ B \\ C \\ M \\ I \\ \text{GNI} \end{bmatrix}, D = \begin{bmatrix} c_0 + e \\ m_0 + e \\ i_0 + e \\ -F \\ G + X + R + F \\ X + R + F \end{bmatrix}$$

and

$$Z = A^{-1}D$$

Model Variables and Specifications

The above macro-model includes six equations. The first three equations are the structural equations or behavioral equations, and correspond to consumption, investment, and imports. The other three equations are merely identities for the national income net of foreign aid, gross national income (including foreign aid), and the Balance of Payments identity. The model has six endogenous variables, which appear on the left-hand side of the first six equations. They are consumption (C), investment (I), imports (M), Gross National Income net of foreign aid (GNI), total gross national income (Y), and Balance of Payments (B).

In addition, the model has four exogenous variables, namely, government expenditure (G), workers' remittances (R), foreign aid (F), and exports (X).

Equation (1) states that private consumption is a function of autonomous consumption and gross national income (GNI). This is basically the Keynesian consumption hypothesis, which maintains that consumption is a function of the absolute level of personal disposable income. However, the use of gross national income in this model instead of the disposable income, was based on the fact that taxes in the Jordanian economy are mostly indirect taxes, not income taxes. This formulation produces a lower marginal propensity to consume (mpc), than an estimated (mpc) based on disposable income.

Equation (2) represents total imports for both private and public uses as a direct function of total aggregate income. Underlying this hypothesis is the proposition that the higher the size of aggregate income the higher the imports, due to a higher level of aggregate demand.

Investment function number (3) is also specified as a direct function of total aggregate national income (Y). The proposition here is that the higher the income the higher the incentive to invest. This is either due to a higher level of aggregate demand or due to a high rate of profit associated with a high level of income.

Equations (4) and (5) are identities for gross national income without and with foreign aid respectively. Equation (6) represents the balance of payments identity, where exports and imports include goods and services, The national income multiplier for government and autonomous expenditures, remittances and exports, are represented by equation (7). They are all equal and expected to be positive. The

autonomous import multiplier is represented by equation (9) and it is equal to the multiplier in equation (7), but with a negative magnitude.

The foreign aid multiplier equation (8), is shown to be less than the value of the remittances multiplier. This is primarily due to the fact that the remittances are direct transfer to the households and hence enter the consumption function, while foreign aid is a direct transfer to the government, which is exogenous in the model.

The balance of payments multipliers with respect to exports and remittances, are shown to be equal in equation (10). However, the balance of payments multiplier with respect to foreign aid equation (12) is shown to be greater than the multiplier with respect to exports or remittances. If the marginal propensity to import is equal to zero, then the balance of payments multipliers with respect to exports, remittances, and foreign aid would be equal and each would have a value of one, while the autonomous imports multiplier would be negative one. However, the higher the marginal propensity to import, the lower the value of the multipliers would be.

The reduced form equations are simply the endogenous variables as functions of the exogenous variables of the model and the error terms. The reduced form equations not only have the advantage of estimating consistent structural coefficients, but they also can be used for forecasting economic phenomena. The coefficients of the exogenous variables in each equation of the reduced form of the model are the total effects of a change in the predetermined variables on the endogenous variable in the left-hand side of the equation after taking into account the interdependences among the endogenous variables. Also, the coefficients of the exogenous variables in this form could be interpreted as the

partial derivative of the endogenous variables with respect to the exogenous variables given all other variables held constant. Therefore, we can say that a reduced form coefficient is either a multiplier or an impact multiplier.¹ For example, once the coefficients are estimated for the consumption equation (13), the value of the coefficient of remittances would be the change of consumption due to a small change in remittances.

Objectives of the Macro-Model

Once the parameters of the models are estimated, it is possible to calculate the following:

1. To calculate numerical values for the short-term multipliers of remittances, foreign aid, government expenditures, autonomous consumption, exports, and imports.
2. To calculate numerical values for the short-term balance of payments multipliers of remittances, foreign aid, imports and exports.
3. To evaluate alternative policy choices by comparing different policy actions. For example, if the government policy target is to get compensation from the labor importing countries for the loss of skilled workers, and on the assumption that the policy was successful in obtaining such compensation, what would be the outcome of such policy if the increase in compensation received was offset by a reduction in foreign aid?

¹Teh-wei Hu, Econometrics: An Introductory Analysis (Baltimore, 1973), p. 50.

4. To evaluate the impact of workers' remittances and foreign aid on consumption, investment, imports, national income, and the Balance of Payments. This evaluation would be possible by examining the estimated coefficients of the reduced form equations.

Model Estimation and Analysis

The model equations are estimated using the annual time series data for Jordan (East Bank) for the period 1967 to 1977, and for Jordan (East and West Bank) for the period 1960 to 1977. All the variables are measured in millions of Jordanian dinars. The structural equations of the model of consumption, investment and imports were estimated using the ordinary least squares (OLS) method and the two-stage least squares (2SLS) method. It is realized, however, that the (OLS) is not a desirable method to apply for estimating simultaneous models. The interaction of interdependent endogenous variables on each other is not taken into consideration when the (OLS) method is used, and hence, the estimated coefficients would be inconsistent.² Two-stage least squares (2SLS) provides, however, consistent estimates of structural coefficients, particularly when the equations are overidentified. An equation is said to be overidentified, when the number of excluded endogenous variables from the equation is greater than the included number of endogenous variables in the same equation.³

²R. S. Pindyck and S. Rubinfeld, Econometric Models and Economic Forecasts (New York, 1976), p. 153.

³Ibid., p. 139.

The estimated coefficients of consumption, investment and imports of Jordan (East Bank) appear in Table XX. Both (OLS) and (2SLS) estimation are reported. It is interesting to note that both methods give almost identical parameters. All the estimated coefficients are significant at a one percent level, and the explanatory power of the independent variable in each equation is very high (97 percent or higher). In the consumption function, the estimated marginal propensity to consume is .588, using the (2SLS) method, and it is .592, using the (OLS) method. Both methods show that gross national income is an important determinant of consumption and explains 97.7 percent of the variation in consumption. The size of the (MPC) is, however, smaller than the estimates for other countries. As an example, the estimated (MPC) for the United States is .89 for the period 1929 to 1976.⁴ An estimation of the consumption function for Jordan (West Bank, and East Bank) for the period 1955 to 1975 using a different specification (consumption as a function of all past incomes), shows that the short run (MPC) to be .44 and the implied long run (MPC) to be .77.⁵

The estimated consumption function for Jordan (East Bank), implies the following saving function:

$$S = - 38.67 + .422 \text{ GNI}$$

Where S is saving and GNI is Gross National Income.

Since taxes are not included as a separate function in the model, saving also includes the taxes. Hence, the high (MPS) .422 is the

⁴E. J. Shapiro, Macroeconomic Analysis (New York, 1978), p. 127.

⁵Adeeb K. Haddad, "An Econometric Monetary Model of the Jordanian Economy" (unpub. Ph.D. dissertation, Oklahoma State University, 1979), p. 84.

TABLE XX

ESTIMATED CONSUMPTION IMPORTS AND INVESTMENT
FUNCTIONS OF JORDAN (EAST BANK)

Dependent Variable	Independent Variable	Estimated Coefficient	t-ratio	DW	R ²	Remarks
(1.0) Consumption (C)	GNI	.592	20.76	2.44	.979	OLS
	c _o	37.56	4.11			
(2.0) Imports (M)	Y	.834	87.03	2.58	.998	OLS
	m _o	-108.104	27.68			
(3.0) Investment (I)	Y	.3009	25.77	1.84	.98	OLS
	i _o	-41.5	-7.37			
(1.1) Consumption (C)	GNI	.588	20.48	2.42	.979	2SLS
	c _o	38.67	4.21			
(2.1) Imports (M)	Y	.835	86.87	2.58	.998	2SLS
	m _o	-108.3	-27.68			
(3.1) Investment (I)	Y	.30	21.66	1.85	.98	2SLS
	i _o	-41.23	-7.31			

total leakages of saving and taxes out of the change in gross national income, not only the propensity to save.

Estimated equation of imports shows that the marginal propensity to import is .835 and significant at a one percent level, using the (2SLS) method. The correlation coefficient is .998. In other meanings, income explains 99.8 percent of the imports variation. The (MPM) means that ten million Jordanian dinars in income would increase imports by 8.35 million. The size of the (MPM) is rather high relative to other countries. For example, the (MPM) of the United States is .073, for the United Kingdom and for Sweden it is .31, for Japan it is .34, and for India it is .10.⁶

The marginal propensity to import shows the extent to which changes in income cause changes in imports. An increase in income would cause changes in imports. An increase in income would cause an increase in imports, and thus worsening the balance of trade rather than adding to the domestic multiplier process by becoming a further new demand for domestic goods and services.

The investment function shows that the estimated marginal propensity to invest (MPI) out of total national income is .30. Unlike the (MPM) the (MPI) would increase the multiplier value, the higher the (MPI) the higher would be the value of the multiplier.

⁶C. P. Kindleberger and P. H. Lindert, International Economics (Homewood, 1978), p. 300.

The Impact of Workers' Remittances on National
Income and the Balance of Payments of
Jordan (East Bank)

Utilizing the estimated propensities of consumption, imports and investment, a numerical value of the workers' remittances multiplier and other expenditures multiplier are calculated. The results are reported in equations 7.1 to 12.1 below:

$$(7.1) \quad \frac{\partial Y}{\partial R} = \frac{\partial Y}{\partial G} = \frac{\partial Y}{\partial X} = \frac{\partial Y}{\partial c_0} = 1.05$$

$$(8.1) \quad \frac{\partial Y}{\partial F} = .435$$

$$(9.1) \quad \frac{\partial Y}{\partial m_0} = -1.05$$

$$(10.1) \quad \frac{\partial B}{\partial X} = \frac{\partial B}{\partial R} = .118$$

$$(11.1) \quad \frac{\partial B}{\partial m_0} = -.118$$

$$(12.1) \quad \frac{\partial B}{\partial F} = .635$$

Equation (7.1) shows that the value of the workers' remittances multiplier is equal to 1.05. This value represents also the multiplier value of expenditures of government, exports, and autonomous consumption.

This result suggests that an increase in any of the above expenditures, ceteris paribus, by ten million Jordanian Dinars (JD) would increase total national income by 10.5 million (JD), while a similar decrease would cause income to decrease by 10.5 million (JD).

The above values of the expenditure multipliers of Jordan (East Bank) compare well with reported multipliers of the advanced economies, such as of the United States, Belgium and Netherlands; despite the

simple econometric model used for Jordan, as compared with the highly complex models of the other mentioned countries. For example, the first quarter expenditure impact multipliers of the United States range from a low 1.1 to a high 1.8, and the one year cumulative multipliers vary from 1.6 to 2.8.⁷ For Belgium and the Netherlands, the value of the government expenditure multipliers are 1.29 and 1.36 respectively.⁸

The policy implications of the above expenditure multiplier of Jordan suggests that control of emigration or imports has a direct effect on the national income. If a policy is imposed to cut down labor emigration, and subsequently the remittances fall down, the growth of income would be retarded by an amount equivalent to the product of the decrease of remittances multiplied by the value of the multiplier (1.05), while encouraging emigration would increase income by the above product. On the other hand, a policy to decrease the marginal propensity to import would enhance the increase in the value of the multiplier and contribute a direct effect on the increase in income as a result of a change in various expenditures.

It is appropriate when discussing the impact of workers' remittances to point out that both reported and unreported remittances (actual) should be taken into account, especially if the latter are considerable. Since the reported remittances, only, are considered here, taking into account the unreported remittances as well, would show greater effect on the national income or the Balance of Payments.

⁷Allan S. Blinder, et al., The Economics of Public Finance (Washington, D.C., 1974), p. 77.

⁸Albert E. Ando, et al., Studies in Economic Stabilization (Washington, D.C., 1968), p. 191.

Equation (8.1) shows the autonomous import multiplier, and it is equivalent to negative 1.05. A policy aimed to decrease imports by ten million (JD) would increase income by 10.5 million (JD), while a similar policy to increase imports by ten million (JD) would contribute to a decrease income by 10.5 million (JD), ceteris paribus.

Equation (9.1) shows the value of the multiplier of foreign aid to be .435. This rather low value means that an increase in foreign aid by ten million (JD) would only contribute to an increase in the national income by 4.35 million (JD). This low effect of foreign aid on national income, however, needs to be explained. The specification of the consumption function in the model excluded the foreign aid from the total income, and considered it as part of transfers to government not to the household. Hence, the value of the multiplier for foreign aid is less, due to the loss of the incremental consumption out of foreign aid. Had the consumption been a linear function of total income (including foreign aid), the value of the multiplier of foreign aid would be higher and equivalent to the government expenditure multiplier. Taking into consideration that foreign aid is a direct transfer to government, the full effect of foreign aid on the national income should consider the impact of government expenditure on national income as well. This means that the correct effect of foreign aid on national income would be equivalent to the effect of government expenditure. Thus, an increase in foreign aid of ten million (JD) to the government budget would increase income by the product of the multiplier value of 1.05 multiplied by the increase in the government expenditure 10 million (JD) or an increase in income of 10.5 million (JD).

Equations (10.1) to (12.1) show the Balance of Payments multipliers

with respect to remittances, exports, autonomous imports, and foreign aid. The results indicate that the foreign aid multiplier of Balances of Payments is about 5.4 times the multiplier of workers remittances. Thus, an increase of ten million (JD) in remittances would have a positive increase in the Balance of Payments of only 1.18 million, while a similar increase in the foreign aid would have a positive increase in the Balance of Payments of 6.35 million (JD). Similarly, an increase in the autonomous imports of ten million (JD) would have a negative effect on the Balance of Payments of only 1.18.

The policy implications of the estimated multipliers indicate that the foreign aid has a larger favorable effect on the balance of payments than the workers' remittances or exports. On the other hand, if the marginal propensity to import were to be zero, the effects of foreign aid, remittances and exports on the Balance of Payments would be equal, and the multiplier value of each would be of magnitude one. While if it were the case that the added values of the marginal propensity to consume (MPC) and the marginal propensity to invest (MPI) were equivalent to one, then the effect of exports or remittances on the Balance of Payments would be zero, while the foreign aid would be positive.

Since it is reasonable to assume that marginal propensity to consume would not be zero, and more likely to remain positive, the findings indicate that the lower the marginal propensity to consume (the higher the marginal propensity to save), ceteris paribus, the higher would be the value of the multiplier of workers' remittances, and the greater their effect on the Balance of Payments; while the higher the marginal propensity to consume (the lower the marginal propensity to save), the

lower the value of the multiplier, and the lower the effect of remittances on the Balance of Payments.

Thus, to have a positive effect on the Balance of Payments various policies could be directed to either lower the (MPC) and encourage savings, or to cut down on imports and encourage substitution of domestically produced goods for imports.

Thus far the results of the multiplier analysis indicate that workers' remittances are found to have a direct impact on the national income and the Balance of Payments. Foreign aid is found to have a similar effect.

Further evidence on the economic effects of workers' remittances on national income and its main components could be obtained utilizing the estimated results of the reduced form equations. The advantage of using the reduced equations coefficients is to find the impact of workers' remittances in income, investment, or imports, taking into account the interdependences among these variables. These estimated equations of the reduced form equations appear in Table XXI.

Equations (13.1) to (17.1) show that the coefficient of workers' remittances is positive in the equations of imports, investment, income, and Balance of Payments, but the results are statistically insignificant and also show an unexpected negative sign in the consumption equation.

Similarly, foreign aid has a positive effect on imports, income, and the balance of payments. Only the coefficient of the balance of payments is significant at a ten percent level. Also, foreign aid shows unexpected negative effects on consumption and investment, but is statistically insignificant. Exports on the other hand, show a positive effect on imports, investment, and income, with a statistically

TABLE XXI

ESTIMATED EQUATIONS OF THE
REDUCED FORM MODEL
JORDAN (EAST BANK)

(13.1)	$C = 98.30 - .42 R - .20F + .53G + 1.28X$ $t_{\bar{2}}\text{ratio} \quad (1.86)(-.53) \quad (-.37) \quad (.59) \quad (1.55)$ $R^2 = .96$ $DW = 1.44$
(14.1)	$M = 4.67 + .21R + .28F + .47G + 1.56X$ $t_{\bar{2}}\text{ratio} \quad (.14) \quad (.45) \quad (.86) \quad (.86) \quad (3.12)**$ $R^2 = .995$ $DW = 1.67$
(15.1)	$I = 41.11 + .08R - .23F - .42G + 1.03X$ $t_{\bar{2}}\text{ratio} \quad (1.73) \quad (.23) \quad (.95)(-1.03) \quad (2.7)**$ $R^2 = .98$ $DW = 2.06$
(16.1)	$Y = 134.7 + .43R + .28F + .63G + 1.75X$ $t_{\bar{2}}\text{ratio} \quad (3.32)(.71) \quad (.68) \quad (.91) \quad (2.9)**$ $R^2 = .99$ $DW = 1.47$
(17.1)	$B = -4.67 + .78R + .71F - .47G - .56X$ $t_{\bar{2}}\text{ratio} \quad (-.14)(1.6) \quad (2.19)**(-.86)(1.12)$ $R^2 = .62$ $DW = 1.64$

**Significant at five percent.

significant coefficient at the five percent level. The results indicate that a one million (JD) increase in exports would cause an increase in imports of 1.56 million (JD), 1.75 million in income, and 1.03 million in investments.

Model Estimated Equations: Jordan
(East Bank and West Bank)

As mentioned earlier in this chapter, the model is estimated using two sets of data. The preceding analysis was conducted on estimated relations utilizing data of Jordan (East Bank) for the 1967 - 1977 period. The present analysis is concerned with estimated relations of Jordan (East Bank and West Bank), and utilizing data for the period of 1960 to 1977.

Table XXII contains the estimated structural equations of the model, together with the numerical calculations of the various multipliers. In the table, equations (1.2) to (3.2) show the results of the estimated equations of consumption, imports, and investment. The equations were estimated using the OLS method. Although the OLS method is generally not applicable to simultaneous equation models, in some situations OLS does as well as 2SLS. For example, if the R^2 values in the reduced-form regression (that is, stage 1 regressions) are very high, in excess of .8, the classical OLS estimates and 2SLS estimates will be very close.⁹

The coefficients of the equations (1.2) to (3.2) are all significant at a one percent level or better, and the explanatory power of the

⁹Damodar Gujarati, Basic Econometrics (New York, 1978), p. 379.

TABLE XXII

ESTIMATED STRUCTURAL EQUATIONS, NATIONAL INCOME
AND BALANCE OF PAYMENTS MULTIPLIERS
JORDAN (EAST BANK AND WEST BANK)^a

(1.2)	C = 15.80	+ .688 GNI
t-ratio	(2.99)	(45.10)
R ² = .992	DW 3.31	
(2.2)	M = -84.17	+ .72Y
t-ratio	(-7.22)	(25.7)
R ² = .996	DW .97	
(3.2)	I = -17.65	+ .227Y
t-ratio	(-4.79)	(25.66)
R ² = .976	DW 1.86	
(7.2)	$\frac{\partial Y}{\partial G} = \frac{\partial Y}{\partial R} = \frac{\partial Y}{\partial X} = \frac{\partial Y}{\partial c_o} = 1.24$	
(8.2)	$\frac{\partial Y}{\partial F} = .3875$	
(9.2)	$\frac{\partial Y}{\partial m_o} = -1.24$	
(10.2)	$\frac{\partial B}{\partial R} = \frac{\partial B}{\partial X} = .1055$	
(11.2)	$\frac{\partial B}{\partial m_o} = -.1055$	
(12.2)	$\frac{\partial B}{\partial F} = .719$	

^a"Chow Test" was applied to see if the estimated coefficients of consumption, imports and investment of Jordan (East/West Bank) are not statistically significant from the respective coefficients of Jordan (East Bank); and the conclusion of the test was the rejection of the null hypothesis (equality of the coefficients) for investment and imports, but accepting it for consumption. This suggests that a structural shift has occurred in the functions of investment and imports but not the consumption of Jordan since 1967.

independent variables are very high, 97 percent or higher. The estimated propensities of consumption, imports and investment are .688, .72, and .227 respectively. These propensities are greatly different in contrast to the earlier Jordan (East Bank) propensities. For example, the respective propensities of Jordan (East Bank) are .588, .83, and .30. This contrast shows that the (MPC) of Jordan (East Bank) is far below the (MPC) of Jordan (East/West Banks). This could perhaps indicate that consumption behavior could have changed in the East Bank, since the 1967 Arab-Israeli War. On the other hand, the lower (MPC) of the East Bank, could be attributed to higher transfers of income from the households of the East Bank to those inside the West Bank. Whatever the explanation of the lower (MPC) of Jordan (East Bank), would be, this contrast shows that households in the East Bank are saving more of their sincome since 1967.

Similar comparison of the import and investment propensities show that the Jordan (East Bank) propensities are higher than the estimated results of Jordan (East Bank/West Bank). This also could be perhaps considered as an upward shift in these propensities, especially as a result of the influx of refugees from the West Bank since 1967.

The above estimated propensities were used to calculate the multipliers of various expenditures and the Balance of Payments multipliers. The results are shown in equations (7.2) to (12.2). Equation (7.2) is the multiplier of government expenditures which is equal to each of the multipliers of remittances, exports and autonomous consumption. The value of this multiplier is 1.24. This means, for example, that workers' remittances have a positive effect on national income. An increase of ten million export expenditures, government,

and autonomous expenditures, also have a similar and equivalent positive effect on income.

Foreign aid and autonomous imports have opposite effects on the national income. This is shown in equations (8.2) and (9.2), which represent the multipliers of foreign aid and autonomous imports respectively. Foreign aid has a positive multiplier of .3875 in value, and autonomous imports have a negative multiplier of (-1.24). However, the argument forwarded earlier in this chapter, concerning the full extent of foreign aid effect, should take into consideration the government expenditures effect on income as well, and is applicable here also.

Equations (10.2), (11.2), and (12.2), represent the Balance of Payments multipliers with respect to remittances (which is equivalent to the multiplier of exports); autonomous imports, and foreign aid respectively. Clearly, remittances and foreign aid have positive effects on the Balances of Payments, but the latter has greater positive effect (about seven times greater) than the remittances. Autonomous imports has a low effect on the Balance of Payments too, but opposite in sign to the remittances effect.

Further evidence on the role and magnitude of workers' remittances effect on the national income, its main elements, and the Balance of Payments is given from the estimated results of the reduced-form equations. However, these results are based on a macro-model utilizing a slightly different specification of the structural equations of consumption, imports and investment of the earlier macro-model.¹⁰ The results

¹⁰The specifications of the structural equations are as follows: $C=f(R, F, GDP, e)$, $I=f(R, F_1, GDP, e)$ and $M=f(R, F, C, e)$, where all variables are as defined before, and F_1 is foreign aid lagged one period, and GDP is Gross Domestic Product = $Y-R-F$.

of the estimated reduced-form equations appear in Table XXIII below.

Equations (13.2) to (17.2) show that worker's remittances have a positive effect on consumption, investment, national income, and the balance of payments, but a negative effect on imports. However, the coefficient of worker's remittances in these equations is only significant at five percent and ten percent level in the income and Balance of Payments equation respectively, and insignificant in the others.

In the income equation (16.2), the increase in workers' remittances by one million (JD), would cause an increase in income of 2.05 million in the national income. Similar increase in remittances would bring about an increase of 1.28 million (JD) in the balance of payments.

Similarly, government expenditures and exports show a positive effect on consumption, imports, investment and income, but a negative effect on the balance of payments. though the coefficient of exports is not significant in the balance of payment or in the investment equations.

In summary, the multiplier analysis, and the reduced form estimation show that remittances have a positive effect on the national income and the balance of payments.

The policy implications of these results suggest that control of migration or reduction of the remittances would result in a significant negative effect on the national income, and a mild effect on the Balance of Payments.

TABLE XXIII

ESTIMATED EQUATIONS OF THE REDUCED
FORM MODEL JORDAN (EAST
AND WEST BANK)

(13.2)	$C = 50.5 + .36R - .37F_1 - .01F + 1.74G + .64X$
$t_{\bar{2}}\text{ratio}$ $R^2 = .9957$	(6.21)(.54)(-1.24) (-.05) (5.12)* (2.01***)
(14.2)	$M = 3.72 - .28R + .11F_1 + .07F + .57G + 1.56X$
$t_{\bar{2}}\text{ratio}$ $R^2 = .9978$	(.49)(-.46) (+.41) (.23) (1.82)*** (5.26)*
(15.2)	$I = -4.65 + .43R + .23F_1 - .20F + .60G + .13X$
$t_{\bar{2}}\text{ratio}$ $R^2 = .9902$	(-.94)(1.07) (1.28) (-1.0) (2.94)**(.67)
(16.2)	$Y = 42.16 + 2.08R - .25F_1 + .70F + 2.78G + .21X$
$t_{\bar{2}}\text{ratio}$ $R^2 = .9981$	(4.47) (2.70)**(-.73)(1.80)*** (7.04)* (.57)
(17.2)	$B = -3.72 + 1.28R - .11F_1 - .92F - .57G - .56X$
$t_{\bar{2}}\text{ratio}$ $R^2 = .653$	(-.49)(2.09)***(-.41) (3.04)*(-1.82)*** (-.49)

* Significant at one percent.
 ** Significant at five percent.
 *** Significant at ten percent.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

Summary

The main objectives of this study as stated in this research were:

1. To gain an empirical understanding of labor migration between two groups of the Arab countries. The first group is considered to be labor-rich, and referred to in this study as labor-rich Arab states (LRAS), and includes seven countries, namely, Jordan, Egypt, Lebanon, Sudan, Syria, and the two Yemens (North Yemen and South Yemen). The second group is considered to be oil-rich, is referred to as oil-rich Arab states (ORAS), and includes nine countries: Algeria, Bahrain, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).

2. To study the consequences of workers' remittance for the Jordanian economy, particularly their impact on the national income and the balance of payments.

3. To derive policy implications for Jordan, the two Arab groups, and the region.

Two analytical methods were utilized to satisfy the above objectives: an econometric analysis to study the labor migration determinants, and a macro-economic model of the Keynesian demand-oriented type designed to study the consequences of migration to the Jordanian economy.

With regard to the study of the determinants of migration, three migration functions were specified to explain the flow of labor migration from LRAS to ORAS. Oil revenue, income, and population at both origin and destination, and distance were used as explanatory variables in these functions.

Utilizing pooled cross-sectional data of ORAS and LRAS for 1975, the relationships were then estimated in log-linear form for the LRAS group, the ORAS group, and for each country of the two groups.

The important findings and conclusions of the analysis of the results will immediately follow this summary.

With regard to the study of the consequences of workers' remittances, a macro-economic model of six equations was specified to the Jordanian economy. This included three behavioral equations for consumption, investment, and imports, and three identities for national income net of foreign aid, national income including foreign aid, and the balance of payments.

The parameters of the model were then estimated utilizing two sets of data: annual time series data for Jordan (East Bank) for the period 1967 to 1977; and for Jordan (East/West Banks) for the period 1960 to 1977. Model parameters were estimated by the ordinary least squares (OLS), and two-stage least squares (2SLS). Utilizing the multiplier analysis, the effects of workers' remittance and foreign aid on the national income and the balance of payments of Jordan were then evaluated. The results of the analysis and the findings are contained in the conclusions section below.

Conclusions

The results and findings of the study of labor migration between Labor-rich Arab states (LRAS) and oil-rich Arab states (ORAS) indicate the following:

1. Oil revenues and income at destination are important determinants of migration between the two Arab groups. Both variables are found to have positive elasticities, indicating strong "pull" effect to labor migration. However, the income elasticity of migration is higher than the oil revenue elasticity, 1.67 as against 1.14. This indicates that immigrants are more responsive to higher income (higher wages) than to the increases in the oil revenues.

2. Both populations at origin and at destination are found to affect migration positively, indicating that countries of larger populations supply more migrants than countries with smaller populations; and these migrants are more attracted to larger populations at destination than to smaller populations. However, the origin population elasticity is found to be less than one, indicating that migration increases less than in proportion to origin population. This is in contrast to the population at destination elasticity, which is found to be greater than one, indicating that migration increases more than in proportion to destination population.

3. Distance is found to have a significant dampening effect on migration. The high negative elasticity of distance indicates that either costs (psychic or financial) or lack of information are important deterrants to migration between LRAS and ORAS.

4. A hypothesis concerning the Palestinians' mobility was tested in this study. The results indicate that the continued Arab-Israeli

conflict, and the loss of the Palestinians' economic base, i.e., land, had contributed to their increased mobility.

With regard to the study of the consequences of workers' remittances to the economy of Jordan, the following conclusions can be drawn:

1. Remittances have a significant impact on the national income, but a mild impact on the balance of payments. The results indicate that a 10 million (JD) increase in workers' remittances would increase the national income by 10.05 million (JD), but would affect the balance of payments by 1.18 million (JD) (reduce the deficit).

2. In contrast to the impact of remittances, foreign aid was found to have a relatively smaller effect on national income, but greater effect on the balance of payments. An increase of 10 million (JD) of foreign aid would increase the national income by 4.35 million (JD), while it would affect favorably the balance of payments by 6.35 million (JD).

This apparent discrepancy between the impact of remittances and foreign aid on national income and the balance of payments is due to the fact that remittances are direct transfers to the household income, and hence generate more income via the marginal propensity to consume, while foreign aid is a direct transfer to the government, and are not part of the household consumption.

3. A structural shift in the Jordanian economy seems to have occurred since the Arab-Israeli war in 1967. This conclusion could be drawn when different marginal propensities for Jordan (East Bank) are compared to the marginal propensities of Jordan (East/West Banks). The marginal propensities of consumption, imports, and investment for

the East Bank are found to be .59, .84, and .30, respectively, and .69, .72, and .23 for Jordan (East/West Banks).

Policy Implications of the Study

The overall conclusion drawn from this research seems to support the theoretical implications of the classical theory of factor mobility. Apart from the social costs which migration may cause to the origin and to the destination countries, the present pattern of the migration flows between the labor-rich Arab States (LRAS) and the oil-rich Arab states (ORAS) is in the right direction, and constitutes an efficient process of resource transfer and reallocation of labor from lower income states to the higher income states.

If workers are to continue enhancing economic efficiency in the allocation of resources, they must be capable and willing to make the appropriate occupational, industrial, or geographic adjustment as dictated by changing economic conditions. The policymaker's task would be to stimulate the labor-force toward the desired direction, by manipulating the factors that are most likely to influence the labor-force toward the desired labor-supply adjustment.

The following recommendations for policy guidance and for further research are relevant.

1. In general, policies to enhance the free labor mobility between the two Arab groups are desirable. Particularly, policies to increase information on distant labor markets, and to reduce labor movement costs would be useful.
2. To enhance the favorable impact of remittances on the Jordanian national income and the balance of payments, continued policies to

increase the free flow of capital to Jordan coupled with policies to encourage import substitution industries are most desirable.

3. Finally, for further research on determinants of migration for skills-specific labor markets, disaggregated data is most needed. Similar studies to the present one could then be conducted. It is recommended, however, to include specific variables such as real wages, real costs, education level, or urbanization degree. Furthermore, simultaneous models which consider supply and demand of labor are recommended. The suggested disaggregated models could prove to be useful as a policy guidance on matters of controlling or encouraging migration.

Specifically, the following policy recommendations and guidelines for policy formulation seem to be relevant:

1. Since the flow of Arab labor as this study has shown appears to be proceeding in the right direction, ways need to be developed to both regulate the flow of labor and properly stimulate and channel it. The states should be studying the following possible developments.

a. For years now the Arabs have been discussing and planning Arab unity. If this finally proves feasible and is accomplished the whole Arab labor problem will transform itself from one of international labor migration to internal labor migration. In such an event labor migration will proceed in accordance with classical economic factors now applicable to internal labor migration without all the political problems which are a feature of international labor migration.

b. There is also talk of an Arab economic union following the example of the European Economic Union (the European Common Market). In fact, several steps have been taken in this direction. Under such a system the Arab states will probably agree to the free flow of labor

within the Arab economic union. As in the case in Europe now, the only restrictions are those relating to types and qualifications of the labor force allowed unrestricted migration within the states of the union. The Arab states should establish a special committee of experts to study the European model and conduct a feasibility study for possible application in the Arab world.

c. If the above two possibilities fail to materialize, or until such time as they materialize, the oil rich Arab states and the labor rich states can begin to negotiate either general and comprehensive agreements or bilateral agreements aiming at the most efficient regulation of the flow of labor and all other policies pertaining to both the quality and efficiency of the labor involved. This could include policies aimed at increasing the flow of information to the distant labor markets and proper dissemination of such information.

d. It seems that so many of the labor rich countries in the Arab world at present receive substantial financial subsidies and loans from the oil rich states. In the language of policies, their action would require a guid pro quo arrangement, meaning that the states which are recipient of such subsidies and loans need to respond in kind to the needs of the countries supplying the subsidies and loans. An area where they can meet such a need is in the area of human resources.

e. It must be remembered that labor immigration in the Arab world has become an established fact for years and it generates expectations which cannot easily be tampered with. Any attempt, therefore, by any of the countries involved to tamper with this flow will lead to possible serious and dramatic political developments in inter-state relationships. In addition, one should anticipate pressure from interest groups in both

the receiving and sending countries to maintain the status quo, even if economic conditions call for a change in the status quo. Finally, any such action could be interpreted as proceeding against the sentiments and feelings of Arab solidarity and produce serious repercussions across the Arab world.

2. The labor sending states need to consider and fully study the following policy matters:

a. If a decision to stop or curtail the flow of labor is not easy to take or accept for both economic and political considerations, the state should proceed with an in-depth study of the whole labor migration problem with the expressed aim of changing state laws to eliminate all possible injustices and inequities in the system. State procedures for exit, entry, customs, passports, permits, etc. must be reviewed and streamlined to insure an orderly operation that is essentially humane and just in its philosophy and approach.

b. The state must commence thorough statistical studies of the labor market and labor flow. First, it must determine the essential needs of the state at present and in the future, and secondly, the impact of such labor egress on the overall economy of the state. On the strength of these studies the state should be in a position to develop an overall labor policy that takes into consideration what segments of the labor market are to be curtailed from emigration, in the national interest, and the total development of school and vocational training systems to cater to the established needs. Such studies might entail cooperation on these lines with the host countries.

c. For Jordan, human resources are her most valuable resources and source of wealth. Recognizing this fact requires that development

of labor become a central strategy in any development process for Jordan. In the long run a policy goal should be to maintain a manpower demand-supply balance of the domestic market and the demand of the oil rich Arab states.

This goal would require unilateral actions by Jordan, as well as bilateral or multilateral action by Jordan and the oil rich Arab states. On one hand Jordan, unilaterally, should aim to renovate her education system in a manner that is flexible to meet the manpower needs of the market. On the other hand, cooperation with the oil-rich Arab states to establish new vocational and technical colleges, training institutes, and universities, or expanding the existing institutions with the object of sharing the output of these institutions, would constitute another step toward meeting the growing demand for labor. This cooperation in manpower training between Jordan and other labor-rich Arab states and the oil-rich states could prove to be a right step toward a common Arab labor market.

In the short run, however, Jordan could overcome the shortage in labor force supply by several means. Important among these are: the encouragement of female and teenage work; introducing two-shift work; attracting back Jordanian emigrant labor; importing foreign labor; and, finally by the market adjustment of wages.

3. The labor receiving states need to consider the following policy suggestions.

a. They should periodically review and study in depth their labor laws and regulations to insure that the flow of labor is more streamlined and humane. The labor market has a great capacity of passing around damaging information which could easily lead to labor avoiding

specific countries because of their laws or the way they treat the local migrant workers.

b. They should be both open and explicit about their labor laws and share them with the sending countries. Such exchanges should of necessity explain terms, benefits, etc. the migrant workers should expect to receive. One important recommendation is that the host countries should avoid the promulgation of laws and regulations of an ex post facto nature, unless such laws increase the benefits of the labor force. In no way should such laws or regulations reduce benefits already allowed or provide restrictions not in force before the migrant laborers arrived in the country.

c. The host states need to review some of the laws relating to migrant workers particularly in so far as they apply to ownership. Present laws seem to be exceptionally strict in nature as they do not allow migrant workers to own immovable property. They should also reconsider their present laws dealing with the transfer of money outside the country and make them more favorable to migrant workers.

d. The host states might find some benefit in changing their immigration laws to allow at least essential migrant workers to become legal immigrants and eventually acquire the citizenship of the host country. The U.S., faced with a similar problem, has continuously followed the policy of accepting immigration.

Finally one important factor to which all the states of the region should address themselves is: if the Arab-Israeli question is finally resolved, and the Arab armies are demobilized, what will this influx of such large numbers of able bodied persons do to the labor market? While this might now appear to be years ahead, no state should allow future policy to develop by default for lack of preparation.

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APPENDIX

DATA EMPLOYED IN STUDY

The tables in this Appendix include the data employed in this research. The following are the important sources consulted in obtaining these tables together with the relationships used.

- (1) Central Bank of Jordan, Monthly Statistical Bulletin, XV (1979).
- (2) United Nations. Yearbook of National Accounts Statistics. Vol. I. Individual Country Data, 1977. New York: United Nations, 1978.
- (3) Agency for International Development (AID). Regional Cooperation in the Middle East. Washington: Department of State, 1979.
- (4) International Monetary Fund. International Financial Statistics, Relevant Issues. Washington.
- (5) Birks, J.S. and C. A. Sinclair. International Migration Project, Relevant Country Case Studies. Durham: The University of Durham, 1978.

RELATIONSHIPS:

- (1) $I = \text{Investment on Capital Formation}$
- (2) $GDP = \text{Consumption} + \text{Government Consumption} + \text{Investment} + \text{Exports} - \text{Imports}$
- (3) $GNI = GDP + \text{Remittances}$
- (4) $\text{Total GNY} = GNI + \text{Foreign Aid}$
- (5) $B = \text{Exports} + \text{Remittances} + \text{Foreign Aid} - \text{Imports}$

TABLE XXIV

ARAB MIGRANT WORKERS FROM LRAS TO ORAS FOR 1975^a

To/From	Jordan	Egypt	Syria	Lebanon	North Yemen	South Yemen	Sudan	Total
Algeria ^b	.4	1.0	.4	0	0	0	0	1.8
Bahrain	.6	1.2	.1	.1	1.1	1.1	.4	4.6
Iraq	5.0	7.0	.2	3.0	0	0	.2	15.4
Kuwait	47.7	37.6	16.5	7.2	2.8	8.7	.9	121.4
Libya	14.2	229.5	13.0	5.7	0	0	7.0	269.4
Oman ^b	2.6	5.3	1.5	0	1.0	0	.2	10.6
Qatar	6.0	2.9	.8	.5	1.3	1.3	.4	13.2
Saudi Arabia	175.0	95.0	15.0	20.0	280.0	55.0	35.0	675.0
UAE	14.5	12.7	4.5	4.5	4.5	4.5	1.5	46.7
Total	266	392.2	52.0	41.0	41.0	70.6	45.6	1158.1

Sources: ^a J. S. Birks and C. A. Sinclair, International Migration Project: A Summary of Provisional Findings (Durham, 1978), p. 13.

^b Zafer H. Ecevit, International Labor Migration in the Middle East and North Africa paper presented to the Rockefeller Foundation Conference on International Migration (Bellagio, Italy, 1979), p. 5.

TABLE XXV
 DISTANCES IN AIR MILES
 BETWEEN LRAS AND ORAS

To/From	Jordan	Egypt	Syria	Lebanon	North Yemen	South Yemen	Sudan
Algeria	1860	1620	1830	1770	2850	2970	2250
Bahrain	967	1200	979	1045	859	1008	1638
Iraq	480	780	450	480	1230	1380	1410
Kuwait	739	997	736	802	986	1150	1361
Libya	1331	1089	1351	1071	2190	2096	2340
Oman	1470	1710	1500	1530	1080	1140	1740
Qatar	1051	1277	1066	1132	833	930	1399
Saudi Arabia	750	769	840	882	533	712	597
UAE	1260	1500	1264	1329	1091	914	1616

Source: Cook's Travel Agency, Beirut. Distances between LRAS and Algeria, Iraq, and Oman are based on straight line distances (map), from The Middle East and Africa, 1978/1979, (London, 1978).

TABLE XXVI

LABOR-RICH ARAB STATES (LRAS) PER CAPITA
INCOME, TOTAL POPULATION, ACTIVE
POPULATION AND PARTICIPATION
RATE FOR 1975

	Per Capita Income	Total Population	Active Population	Participation Rate
Country	Dollars	Million	Million	%
Japan	490	2.7	.754	20.7
Egypt	250	37.2	10.5	28
Syria	760	7.4	1.89	26
Lebanon	1070	3.1	.745	26
N. Yemen	250	5.3	1.888	31.5
S. Yemen	210	1.7	.441	26.5
Sudan	270	15.7	5.758	28.3

Source: Income figures are from World Bank Atlas, (Washington, 1977); and population figures are from Yearbook of Labor Statistics, (Geneva, 1978).

TABLE XXVII
OIL-RICH ARAB STATES (ORAS) PER CAPITA
INCOME, OIL REVENUES AND
POPULATION FOR 1975

	Per Capita Income	Oil Revenue	Population
Country	Dollars	Million Dollars	Million
Algeria	900	3262	15.7
Bahrain	3130	340	0.3
Iraq	1260	7500	11.1
Kuwait	12120	5735	1.0
Libya	4900	5100	2.4
Oman	2060	1415	0.8
Qatar	10800	3567	0.2
Saudi Arabia	8105	25676	4.6
UAE	14060	6000	0.7

Source: Oil Revenue figures are from Annual Statistical Bulletin, (Vienna, 1976); and population and income are from World Bank Atlas, (Washington, 1977).

TABLE XXVIII

GROSS/NET NATIONAL INCOME AND GROSS DOMESTIC
 PRODUCT OF JORDAN (EAST BANK)
 1967-1977 (Million JD)

Year	GNYP (1)	GN (2)	GDP (3)
1967	192.60	142.50	131.2
1968	228.49	166.40	156.1
1969	241.24	197.40	183.4
1970	224.11	187.00	174.4
1971	235.59	199.40	186.2
1972	274.50	221.00	207.2
1973	301.01	241.50	218.3
1974	355.70	279.30	247.3
1975	482.50	342.50	278.6
1976	655.699	528.699	387.9
1977	783.90	617.90	472.0

- (1) Gross National Income including Foreign Aid
 (2) National Income without Foreign Aid
 (3) Gross Domestic Product = Consumption + Investment + Exports +
 Government Expenditures - Imports

Source: Central Bank of Jordan, Monthly Statistical Bulletin, XV (1979);
United Nations Yearbook of National Accounts Statistics, Vol.7
Individual Country Data 1977 (New York, 1978).

TABLE XXIX

WORKERS' REMITTANCES, FOREIGN AID, AND
EXPENDITURES ON NATIONAL INCOME OF
JORDAN (EAST BANK)
(IN MILLION JD)
1967-1977

Year	R (1)	F (2)	X (3)	M (4)	C (5)	G (6)	I (7)	V (8)	D (9)	TX (10)
1967	11.30	50.10	20.80	59.80	103.8	44.0	22.4	-1.6	6.3	15.6
1968	10.30	62.09	18.90	73.60	127.4	55.9	27.5	.5	7.6	17.9
1969	14.00	43.84	20.60	97.70	156.8	64.0	39.7	3.9	7.7	20.9
1970	12.60	37.11	17.60	76.80	152.8	58.7	22.1	-3.1	7.7	19.7
1971	13.20	36.19	17.80	88.90	161.7	60.4	35.2	4.5	7.9	20.2
1972	13.80	53.50	37.00	117.80	177.4	68.3	42.3	6.0	8.1	24.4
1973	23.20	59.51	52.40	136.40	183.1	80.0	39.2	-8.0	8.3	29.4
1974	32.00	76.40	80.30	196.10	199.8	97.7	65.6	2.4	8.5	4.9
1975	63.90	140.00	118.90	301.10	261.9	110.1	88.8	.9	9.0	9.2
1976	140.80	127.00	192.00	335.70	325.5	155.9	150.2	12.2	10.0	43.2
1977	145.90	166.00	242.00	546.20	412.8	156.6	206.8	5.5	11.0	74.2

(1) Remittances; (2) Foreign Aid; (3) Exports; (4) Imports; (5) Private Consumption; (6) Government Expenditures; (7) Private Total Investment (including inventory changes); (8) Inventory Changes; (9) Depreciation; and (10) Indirect Taxes.

Sources: United Nations, United Nations Yearbook of National Accounts Statistics, Vol. I, Individual Country Data 1979 (New York, 1979); Central Bank of Jordan, Monthly Statistical Bulletin, XV (1979).

TABLE XXX

GROSS/NET NATIONAL INCOME AND
GROSS/NET DOMESTIC PRODUCT
JORDAN (EAST/WEST BANK)
1960-1977 (MILLION JD)

Year	GNYD (1)	NNYD (2)	NY (3)	GGDP (4)	NGDP (5)
1960	126.52	122.420	101.59	98.29	94.19
1961	148.20	143.900	123.60	120.90	116.60
1962	149.80	144.600	125.70	119.00	113.80
1963	155.09	149.690	132.22	129.06	123.66
1964	184.00	178.000	154.70	149.00	143.00
1965	196.07	189.370	173.30	167.61	160.91
1966	202.50	195.300	178.80	170.80	163.60
1967	256.10	249.300	199.20	194.80	188.00
1968	259.36	251.160	189.07	186.90	178.70
1969	277.56	268.760	224.92	219.69	210.89
1970	259.61	251.210	214.10	209.86	201.46
1971	272.78	264.280	228.09	223.42	214.92
1972	316.48	307.480	253.98	249.16	240.16
1973	350.85	341.050	281.54	268.51	258.71
1974	450.30	439.699	363.30	341.91	331.31
1975	648.20	639.200	499.20	444.30	435.30
1976	870.50	860.500	733.50	602.70	592.70
1977	975.00	965.00	799.00	663.10	653.100

(1) Gross National Disposable Income; (2) GNYD - Depreciation;
(3) NY = NGDP + R; (4) GGDP = Consumption + Investment + Government
Expenditure + Exports - Imports; (5) NGDP = GGDP - Depreciation.

TABLE XXXI

WORKERS' REMITTANCES, FOREIGN AID, AND
EXPENDITURES ON NATIONAL INCOME OF
JORDAN (EAST/WEST BANK)
(IN MILLION JD)
1960-1977

Year	R (1)	F (2)	X (3)	M (4)	C (5)	G (6)	I (7)	V (8)	D (9)
1960	7.39	20.83	12.79	47.05	88.45	27.02	17.09	-.42	4.1
1961	7.00	20.30	17.60	46.60	102.80	28.10	19.00	2.00	4.3
1962	11.90	18.90	19.10	51.80	102.40	29.00	20.30	-1.7	5.2
1963	8.56	17.47	20.26	61.06	116.82	33.04	20.00	-.02	5.4
1964	11.70	23.30	24.60	56.70	123.50	32.30	25.30	6.5	6.0
1965	12.39	16.07	28.54	63.55	138.04	36.79	27.79	3.89	6.7
1966	15.20	16.50	32.10	76.60	149.60	39.20	26.50	-1.2	7.2
1967	11.20	50.10	27.70	63.70	158.50	46.40	25.90	-.60	6.8
1968	10.37	62.09	28.27	90.98	153.36	58.60	37.65	7.01	8.2
1969	14.03	43.84	32.26	108.69	164.47	67.08	64.57	25.21	8.8
1970	12.64	37.11	32.33	89.89	165.07	61.90	40.45	13.04	8.4
1971	13.17	36.19	20.78	93.01	183.00	64.53	48.12	14.70	8.5
1972	13.82	53.50	51.81	119.88	193.52	72.20	51.51	12.11	9.0
1973	22.83	59.51	50.29	136.36	220.00	83.41	51.17	-.13	9.8
1974	31.99	76.40	85.51	184.68	256.78	100.86	83.44	13.27	10.6
1975	63.90	140.00	207.90	403.70	404.70	125.10	110.40	-4.7	9.0
1976	140.80	127.00	307.90	543.00	505.20	146.20	186.40	00	10.0
1977	145.90	166.00	358.30	656.20	577.70	170.20	213.10	00	10.0

(1) Remittances; (2) Foreign Aid; (3) Exports; (4) Imports; (5) Private Consumption; (6) Government Expenditures; (7) Investment Expenditure (includes changes in inventory); (8) Changes in Inventory; and (9) Depreciation.

VITA

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Doctor of Philosophy

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