

CROSS-NATIONAL INTERACTION, CROSS  
NATIONAL INEQUALITY AND VARIATION  
IN IMMIGRATION: AN EXAMINATION  
OF THE FLOW OF PROFESSIONALS  
TO THE U.S. FROM ALL  
WORLD NATIONS

By

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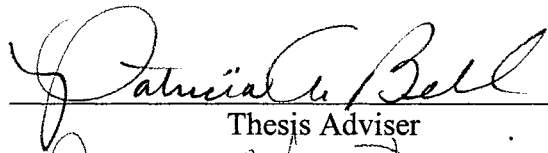
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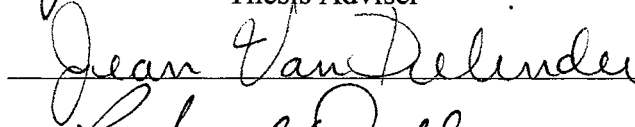

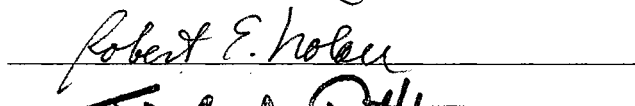
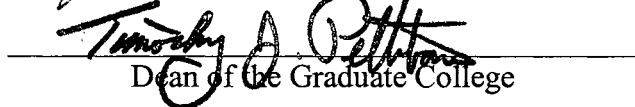
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## CHAPTER I

### INTRODUCTION AND BACKGROUND

The volume of migration worldwide has increased tremendously over the past few decades. This increase in population movement worldwide has been linked to other social and economic global transformations including multinational corporations, ethnic and racial conflict, and growing economic inequality amongst different regions as well as different nations. This research deals with one aspect of migration and its potential impact upon world economic stratification using immigration to the United States as a case study. The research examines the impact of changes in employment classification of immigrants to the U.S. over several decades as an indication of the well-documented phenomenon often referred to as the “Brain Drain”.

The phrase “brain drain” has been applied to the movement of the well-educated and professionally trained individuals from one country (or region) to another. The exchange is one that is unequal so that the sending country experiences a net deficit in the number of highly skilled persons available. The brain drain is an old phenomenon in human history such as “it is as old as science” (Dedijer; 1968:9). However, the modern term “brain drain” is a British invention of the mid-1950s. Although the phenomenon brain drain had been a regional and international problem for many centuries, it did not get much attention until 1962 “when.... the number of students graduating from British universities was inadequate to meet the economic needs of the country and a high

proportion of the inadequate supply were finding employment overseas” (Mackay; 1969:32). During that time along with British brain drain, the professionally skilled people from European countries and from developing countries immigrated to the United States. It started as a small number but it gradually increased to a stream and turned into a non-stop flood (Adams; 1968). As a result the United States had become the destination of a global movement.

Over the last three decades the studies on brain drain issues have shown that, after World War II, development of a nation has depended heavily on knowledge, science, and technology, not on physical effort. The people who have the knowledge, science, and technology are recognized as a new type of resource for a nation since highly trained human resources are distinctively different from physical capital, income, and material resources. As is known, capital and natural resources are passive factors of production. For instance, natural resources are limited and their value depends on whether they are used wisely and effectively by human beings. Highly trained “human brains”, on the other hand, are the active agents who accumulate capital, exploit natural resources, build social, economic, and political organizations, and carry forward national development (Todaro, 1989:330).

Currently some regions and countries in the world have been sending their citizens to the developed countries in increasing numbers, such as Southeast Asia, Eastern Europe, Middle East, Sub-Saharan countries, and Central American countries. Current social, economic, and political conditions of these countries have fundamental impacts on the emigration phenomenon. In addition, globalization of the world countries has created a new world system that shapes the economic, social and political relationship among these countries. This world system approach views all the world countries within

the one system, which consists of three components, core countries, peripheral countries and semi-peripheral countries.

Recently only a few countries accepted large numbers of permanent immigrants including highly skilled professionals such as the United States, Canada, Australia and New Zealand (Kirtz, 1987). Among these the United States is the largest market for human capital to attract the largest highly trained immigrants. In the 1980s the United States annually admitted more than 40,000 scientists, engineers, physicians, nurses, post secondary school teachers, and other professionals as permanent immigrants who come from almost every country around the world (Cheng and Yang, 1998). Carrington and Detragiache (1999) found that among the Organization for Economic Cooperation and Development (OECD) countries, the United States has the highest number of migration of brain drain with 54.3 percent of total immigration who came from developing countries within the OECD. In the same way Iredale (1999) reports that the United States accepted 147,000 employment-based permanent immigrants in 1993, down to 123,291 in 1994 and 85,000 in 1996. These numbers are higher than other highly skilled immigrant accepting countries such as Canada, Australia, France, Germany, and United Kingdom. For these reasons the United States presents the best case for the study of the phenomenon. Thus, immigration of highly skilled personnel from sending countries to the United States needs to be examined, specifically for its connections with structural factors of immigrant sending countries.

There are several explanations for the causes of brain drain from the world countries to developed countries. Mandi (1981), for example, claims that there are three fundamental causes for the immigration of highly trained professionals from less developed countries( LDCs) to more developed countries (MDCs). First is the many



times higher living standards in the developed countries. Second is the shortage of specialists in the advanced countries and their active recruitment of needed specialists. Third is a shortage of jobs and opportunities for intellectuals in developing countries. According to Rao (1979), the reasons for intellectual migrations from one country to another are “the economic, political, social and intellectual demands for the development of knowledge in natural and physical sciences and humanities” (Rao, 1979: 2).

### Statement of the Problem

Although previous studies about brain drain usually focused on under developed and developing countries that sent the large number of their highly trained human power to the United States, they ignored developed countries that also lost their well-educated and professionally skilled human power to the United States. In this base, brain drain phenomenon is a global issue that involves all world countries regardless of their development levels. Consequently, although brain flow from all world countries to the United States is a global issue, its determinants can be different for some countries and for some world regions than the other based on their social and economic characteristics. Therefore, it is necessary to analyze and synthesize the relationships of brain drain with the structural factors of these different countries and regions to reach more comprehensive results. So that these results can help both immigrant sending and receiving countries to control the size of brain flow in the future.

### Objective of the Study

The objective of this study is to examine the relationships of professional immigration with cross-national interaction and cross-national inequality between

immigrant sending world countries and the United States based on empirical evidences. Over the last decade using a longitudinal study at two consecutive points in time 1990 and 2000, the study also compares different world regions to illustrate their differences in the amount of professional migration to the United States. After that the study tests how much world system theory and development (or modernization) theory are efficient to explain the variation in the size of professional migration from all the world countries and all the world regions to the United States.

### The Significance of The Study

This study is important in the field of brain drain research for several reasons. First, it uses the latest available data in 1990 and 2000. Second, unlike most previous studies, this is a longitudinal study that compares two different points over one decade. Third, although prior studies were limited to a small number of countries and failed to use more comprehensive data, this study employs more comprehensive data including all world countries and regions. Fourth, due to the lack of data, former studies could not compare effectively cross-national and cross-regional variation in the size of migration of highly trained people, this study compares different world countries and regions to show similarities and differences among them in the volume of their professional migration to the U.S. Fifth, for comparison, besides developing countries, this research deals with developed countries that have been ignored in most of the previous studies. Sixth, this study tests the efficiency of world system theory and development (or modernization) theory to explain cross-national and cross-regional variation in the amount of professional immigration to the U.S. based on the research findings.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Theoretical Problems in the Study of Migration

Although migration is a global issue that involves all world nations, international labor migration from developing countries has been the primary subject matter of academic literature in the past several decades. However, the lack of data, the level of analysis, and fragmented theoretical explanations are main issues in migration studies. Thus, researchers have tried to measure its extent, to define its dominant characteristics, and to evaluate its contribution to socioeconomic development (Arnold and Shah, 1986; Stahl, 1986a; Hugo and Singhanetra-Renard, 1987; Amjad, 1989; Appleyard, 1991; Iredale, 1999, 2000). Most of these studies have dealt with departing and returning overseas workers and examined the cost and benefits of labor export. However, since researchers have adopted incompatible theoretical perspectives and selected diverse contexts, and wide range of variables for empirical analysis, these studies could not provide clear satisfactory explanations. In addition, as a result of the developmentalist orientation of the field (Kearney, 1986), researchers have been concerned with the evaluation of the consequences of international labor migration on national economies, communities, or households, rather than the identification of the process that leads individuals to pursue employment overseas.

The reviews of literature on migration traditionally recognize three approaches,

which are the functional model, structural model, and an integrative model with its different forms. The functional model of migration is based on modernization theory and neoclassical development economics, which deal with migration as the means by which surplus labor in a largely agricultural economy is transferred to the urban industrial sector providing for economic growth and a psychosocial reorientation of the migrant in the process (Lewis, 1954; Ranis and Fei, 1961; Zelinsky, 1971). The functional perspective emphasizes microeconomic processes, particularly the decision making behavior of individual, who in their desire to improve their life chances respond to real or perceived inequalities in the distribution of economic opportunity by migrating to another place (Goss and Lindquist, 1995). This approach assumes that social process is merely the aggregate of individual actions and the aggregate effect of these individual decisions will eventually result in a reduction in spatial inequalities and a gradual decline in individual motivation to migrate, and later a slowdown of migrant stream (Massey et al, 1993).

On the other hand, structural approach can be identified with three distinct forms of neo-Marxist theory, world systems theory and modes of production theory. These theories explain migration based on the macroeconomic processes that produce sociospatial inequalities and constrain the life chances of individuals as members of specific social classes in particular places. Thus, this group of theories considers migration not as the aggregate result of individuals exercising rational choice, rather considers it as the result of sociopolitical inequalities systematically reproduced within global and national economies (Amin, 1974; Piore, 1979; Wood, 1982; Prothero, 1987; Kearney, 1986). Therefore, international migration does not decrease spatial inequalities and brings equilibrium, but increases inequalities and perpetuates underdevelopment as a result of loss of human capital (Goss and Lindquist, 1995).

The ideological opposition between these two perspectives has been combined into a polarization of the literature, sustaining artificial separation between macro and micro scale analysis, and agency structural determinations in migration (Wood, 1982; Kearney, 1986). These theoretically fragmented migration literature and conflicting conclusions to describe mobility patterns based on either the cumulative result of individual decisions or a manifestation of a society imposing behavioral constraints on individuals have been criticized by several authors (Chapman and Prothero, 1983; Forbes, 1984; Skeldon 1990).

Consequently, for the lack of a unified conceptual framework to provide a comprehensive view of migration process, some scholars have called for an integrated approach that links different levels of social organization, analyzes simultaneously the origin and destinations and considers both historical and contemporary processes (Fawcett and Arnold, 1987; Massey, 1990). Such as the 'new economic approach,' expands the decision making focus of microeconomic functional approaches to incorporate larger social units, typically households and communities, that are not motivated by income maximization but by risk minimization (Stark and Levhari, 1982; Stark, 1991). Decision makers allocate labor in various activities and locations in order to diversify income sources and spread risk connected with investment in agricultural production, petty enterprise, and even formal employment in Third world context (Massey et al, 1993).

On the other hand, the systems approach as a component of the integrative model centers on macro and micro connections between places linked by migration, that is, both the political-economic relations and personal relationships between individuals and families (Fawcett and Arnold 1987: Fawcett, 1983; Kritiz and Zlotnik, 1992). In this base, macro level relations cover political systems, economic dependency/dominance,

immigration policy, and cultural/linguistic association, whereas micro level relations include friendship and kinship resulting from the geographic dispersion of population. And migration is considered as a sequential process of decision, transition, and adaptation by the individual made within the context of general political-economic and specific social relationships at each stage (Fawcett and Arnold 1987: 467-470).

Another type of integrative model is the network approach. In his “network approach,” Massey (1990:5) claims that migration decisions are made jointly by family members within households; that household decisions are influenced by local, social, and economic conditions; that local conditions are, in turn, affected by evolving social and economic structures at the national and international levels, and these relationships are linked to one another over time. For these reasons, analysts are advised to construct multilevel data sets that include information collected simultaneously at the individual, household and community levels and to develop theoretical and statistical models to analyze them.

The importance of these integrative approaches is the identification of the connections between the macro levels and micro levels and specifications of an intermediate object of analysis. In this matter, households and migrant networks are two empirical objects that situate between individual and society. Each one is represented to explain both aggregation of the actions of individual decision makers and the structuring of constraints upon behavior by the global or national political economy (Goss and Lindquist, 1995).

In their study, Massey et al. (1993; 1994) dealt with economic migration that is more or less voluntary migration intended both as temporary and permanent to make money. They neither see migration to flee persecution or war dangers nor consider laws

by sending or receiving countries that facilitate or inhibit international migration. In their early articles Massey et al. (1993) developed a committee of the International Union for the Scientific Study of Population to describe theories that attempt to explain the origin and perpetuation of international migration. These theories consist of four sorts of economic explanations and one political economy approach, which are neoclassical macro economic theory, neoclassical micro economic theory, new economics of migration theory, the dual labor market theory and world systems theory known as the political economy approach. Later Massey and his colleagues also reviewed network theory and theory of cumulative causation.

In their later study, Massey et al. (1994) attempted to test these theories in the context on the North American case based on a regional migration system. After that, Massey et al. (1998) extended the test of theories to data from Europe, the Persian Gulf region, Asia and the Pacific, and South America. They found that each of these theories has some evidence of support, although some had more than others. They rarely found negative evidence. However, their main shortcoming was a lack of evidence often related to lack of appropriate data (Keely, 2000).

Hatton and Williamson (1998) in their study theorize the link between migration and process of economic globalization and mention that migration occurring between countries at different stages of development contributed importantly to the convergence of living standards among them, but this resulted in reducing labor market inequality in source countries and boosting it in destination countries.

Skeldon (1997) argues that migration was common in the past; it is not only the poorest that tend to migrate, but there is rural-urban migration with developing nations as well as rural-rural and urban-urban migration. For him, migration is not the major reason

for the growth of big cities, and no one theory can explain all migrations. He emphasizes the continuity between past and present in migration. Based on his observations, he claims that we live in one of many “ages of migration,” and notes that most migration continues to occur within regions, and points out most migrants head for cities within their regional core or tier. He concludes that the composition of migrant flow should be considered as important as the number of migration to make correct assessment about impact of the migration, because the relationship between migration and development depends on the level of development and the type of migration (Skeldon, 1997).

### The History of Brain Drain

The movement of scientists and scholars throughout history has been so common that it can be considered as a universal phenomenon (Gaillard and Gaillard, 1997). Such as forty-five of the sixty most popular scholars of Ancient Greece left their native countries for the road to wisdom, learning and research (Granberg, 1967, 1969). Although some of them returned, the others maintained their travels or established schools far from their homeland. For instance in the 570 BC Pythagoras finished his travels around the Mediterranean and Asia Minor when he established a philosophical school in Italy (Gaillard and Gaillard, 1997).

In the early years different types of movement of scholars and scientists have taken place. During its glory time, Alexandria welcomed hundreds of the scientists and scholars from Hellenistic world based on the immense research opportunities offered by museums and the gold of Ptolemaic rulers (Parsons, 1952). Another example of movement of scholars and scientists in Antic times is known as Lycee directors in Athens between the fourth century BC and the beginning of the third century AD (Dedijer,



1968). On the other hand, between the eight and tenth century the development of the Arab science in Baghdad attracted intellectual migrations especially by the contributions of Nestorian scholars who came from and transmitted the Hellenic Culture. When Emperor Justinian forced these scholars of the academy of Athens to leave, they came together in east Persia as an invitation of the King of Jundishapur and set up bases for Arab science (Benoit and Micheau, 1989). Medieval Universities were also examples of scientific and intellectual mobility. Students and teachers, who originally came from many different regions and countries of Europe, lived in a city for several years and later moved to other places (Kibre, 1948).

As a result movement was a necessary condition for scientific creation and dissemination of knowledge and without question, scientific migration in the course of history was a combination of the individual's determination to seek greater wisdom, and determined scientific policies (Gaillard and Gaillard, 1997).

### The Meaning of Brain Drain

Cross-national flows of intellectual elites and the resulting de-or multi-nationalization of knowledge are one of the unique phenomena of twentieth century (Ash and Sollner, 1996) and take several forms, such as brain "drain", professional transient, skilled permanent migrants, and business transfers (Iredale, 1999). The issue is complex and complicated and has gone from brain drain to the international exchange of human resources in fifty years. Although much skilled migration was once forced by conflict or by ethnic discrimination, it now includes a search for greater opportunities and better life chances, and the globalization and liberalization of opportunities in newly developing

countries. In this sense, a global labor market is now available for some occupations where individual's skill is his/her greatest asset to be bought and sold (Iredale, 1999).

The debate over brain drain remains complex and inconclusive. In order to explain the determinants of the international movement of skilled manpower to the developed countries, researchers usually use different perspectives. Some have connected brain drain to economic advantages and better opportunities in the host countries. Others have considered an adverse political environment in the home state as an important factor in migration decision. Push and pull model have been used to explain the dynamic nature of migration. As pull factors the most important reasons for migration are the enhanced opportunities for potential migrants, such as opportunity for higher income (Grubel and Scott, 1966), improved living conditions, better working environment, improved research facilities and opportunity for professional growth and development (Rao, 1979; Mandi, 1981; Odunsi, 1996; Jumare, 1997). On the other hand, push factors are underemployment of professionals (Mandi, 1981), nepotism in recruitment, unfavorable work environment and inaccessibility to professional colleagues (Odunsi, 1996), impoverished conditions of service, high inflation, poor remuneration, lack of research incentives (Jumare, 1997; Cheng and Yang, 1998).

Both sending and receiving countries face two sets of issues. For sending countries these are whether to free up or tighten migration; whether to support temporary skilled flows; whether to introduce protective or preventive measures to stem skilled emigration; how to encourage the return of skilled nationals; and whether/how to pursue compensation from post industrialized countries (Iredale, 1999). For the receiving countries the issues are whether to encourage temporary or permanent skilled immigration; the level of entry to permit/promote; how to select/process skilled

immigrants; whether/how to protect the jobs of locals; and how to ensure the successful labor market integration of skilled immigrants (Iredale, 1999).

The migration policies for both nationals and regionals to control the movement of skilled migrants have become more important. Receiving countries have pursued increasingly to benefit from admitting skilled workers and have changed their permanent and temporary migration law/policies to facilitate entry on the condition that it does not result in the job losses of their own workers (Iredale, 1999). Another set of policy frameworks within which skilled migration is occurring is regional blocs. In this base Iredale (1999) analyzes the experience of the European Union (EU) in promoting the flow of skilled labor, movement in this direction in North American Free Trade Organization (NAFTA), Mercosul, the Closer Economic Relations (CER), Agreement between Australia and New Zealand and the Asia Pacific Economic Cooperation (APEC) Forum.

Although much labor flow is associated with the flow of capital, the latter does not impede the former because the movements of labor are subject to restrictions. The unskilled labor movement is strictly controlled by the same Organization for Economic Cooperation and Development (OECD) countries that are “leading the free movement of capital and the creation of a ‘level playing field’ for all types of foreign investment through several instruments such as the proposed Multilateral Agreement on Investment (MAI)” (Malhotra, 1998:4). The same restrictions are also applied to skilled migration even though there is a gradual decline. Nevertheless, the countries attempt to gain more benefits, but avoid any costs of skilled immigration (Iredale, 1999).

## Review of Major Theoretical Perspectives

Although there is no well-developed theory about skilled migration, several theories were commonly used in the field of brain flow. The first is micro level perspective that focuses on the process of professional migration. It was believed that skilled migrants moved to maximize gains from the investment in their education, such as human capital perspective claims that people move to find work and payment more appropriate to their formal education and training. However, this micro level view ignores informal training or the role of institutional factors, discrimination and other factors that caused deficiencies in the labor market. The second is the structuralist neo-Marxist macro-level approach that deals with the impact of gender, race and class as well as the impact of the difference between rich, core, and peripheral nations. But it does not pay attention to institutional factors. The third type of theory is the “structuration” perspective that is concerned with individuals, structural, and institutional (structuration) elements, and focuses more on the important role of agents.

Some believe that a theory about the brain drain issue should take care of some important elements. In this base, Salt and Findlay (1989) suggest that a theoretical framework about skilled migration should include four elements: international spatial division of labor, the nature of careers, the role of internal labor markets, and the lubrication provided by recruitment and relocation agencies. In connection to this, Iredale (1999) adds a fifth element that is the role of policies and bilateral and multilateral agreements.

Typologies of Brain Drain: Some scholars attempt to explain the brain drain phenomena based on several typologies. Such as according to Iredale (1999) there are

four typologies of skilled migrants. The first one is based on motivation as “brain drain”, “forced exodus”, “ethical emigration”, government induced”, and “industrial led”. Many of the earliest movements were forced, such as the flow of 2000 scholars and scientist in 1933 from Germany to the U.S. and Britain was a result of the dismissal and premature retirement from government service of persons who were not of “Aryan” descent. Oppressive regimes, based on overtly or covertly oppressive, have been a consistent determinant in the flow of highly educated people. The migration of Soviet Jews from the former USSR is an example of over oppression and classified as an “ethical emigration” by Simanovsky et al. (1996). On the other hand, government induced includes many types of skilled migration and is closely associated to brain drain. For instance, during the 1930s German specialists were taken to the U.S. to work in Rocket engineering, and to the Soviet Union as part of the Soviet’s missile programme (Simanovsky et al. 1996). In industry led motivation, employers are the main force behind the selection and migration of skilled immigrants. This case is very common in the U.S and in the temporary skilled migration programmes of most countries. Recently the situation of internal labor market of multinational corporations has caused more skilled migration.

Second typology is based on nature of source and destination of brain drain, which views the origins and movements of skilled migration from less developed or more developed countries to more developed or less developed destinations. The basic flow of skilled labor is now from less developed to post-industrial countries. Demographic changes in countries of the South have brought strong strains on their government capacities to provide education, social security, and especially jobs (Appleyard, 1991). On the other hands, the situation is more severe for skilled nationals who cannot find

work, but even many who do have work opt to migrate for higher rewards and better opportunities. During the 1970s the flow of skilled migrants increased from less developed countries to the oil rich states of Middle East and rapidly industrializing economies such as Singapore, Hon Kong, Taiwan, and S. Korea.

Third typology is based on channel or mechanism that was developed by Findlay and Garrick (1989) to incorporate mechanism by which many skilled individuals migrate. They classified three basic channels: first is the internal labor markets of Multi National Corporation (MNC) which move persons for both personal career reasons and the needs of the company; second is companies with international contracts which move staff within their company; and third is international recruitment agencies which handle large numbers of self-generated flows. In this situation Findlay (1995: 517) considers the concept of channel as very important because the “hierarchically organized global system of production has created new influences which have actively structured the character of skilled exchanges between nations.” (Findlay, 1995: 517).

Fourth typology is based on length of stay as permanent or circulatory/temporary. Many scholars have dealt with length of stay in their typology and made distinctions between permanent and circulation migration. However, the situation is now more complex than before. Appleyard (1985) describes “skilled transients” as those professionals/managers who are highly mobile and increasingly important component of the international labor force, but they are no longer easily distinguishable from business visitors. Attempts to define each group based on their length of stay are not useful. Although many countries show a willingness to accept temporaries, they attempt to close their doors to permanents (Iredale 1999).

Other causes that can influence skilled migrations include the nature of integration of skilled migrants into destination economies. Information transferred back through network about post-arrival experiences affects the choice of destination of future skilled immigrants. Nevertheless, in the 1990s no one theory or typology is sufficient to account for skilled migration (Iredale 1999).

The Invention of the Term of Brain Drain: Although as a phenomenon, cross national flow of scientists increased as result of the rise of Nazism, after World War II, it became more prevalent when an important number of scientist and scholars left their countries in Europe to seek more opportunities in north America, especially in the U.S. In this matter, in 1963, Royal Society applied the term 'brain drain' to describe British scientist and scholars who migrated to the United States (Gaillard and Gaillard 1997). According to Johnson (1965) the intention was to emphasize the trained personnel (especially scientists and doctors) who left the United Kingdom to take up attractive jobs in research in the U.S. During that time the term brain drain referred to the loss of trained minds to the pull of a foreign market. Moreover, due to similarity in training, language and experience, the British skilled professional adopted to the American scientific world, that was developing as a result of movement of skilled personnel from Britain (Hoch and Platt, 1992).

Gaillard, (1991) argues that the term of brain drain was used different ways to explain the condition of brains that migrated from developing countries to the developed countries. Such as those skilled human powers left their countries to study abroad without having enough training and research experiences, so that they were not trained brains when they migrated to the developed countries. In this matter approximately a million students and scientists either have stayed or migrated to the U.S. and Europe after they

finished their programs over the last forty years (Kallen, 1994). Based on economic analysis of the ideology of Third Worldism, the term brain drain takes a different turn but keeps the notion of 'economic drainage, which is connected to the concept of pillage of the South (Amugazer, 1968). While the word 'drain' has kept its economic connotation, the term brain has become more mixed. Such as the term brain indicates increasingly to a 'brain' rather than to a 'trained brain (Gaillard, and Gaillard 1997). Although the meaning of brain drain has been interpreted in different ways, the question of scientific migration regardless of trainable or trained minds is still the fundamental discussion matter among scholars and policy makers.

#### Controversies about Brain Drain

There have been several controversies among scholars, scientists and policy makers in dealing with the brain drain issue. Such as whether international migration of minds synonymous to 'exodus' or a country loses because of migration. Or whether it helps the international circulation of knowledge and which should benefit all? Some scholars refuse to examine the migration of the professional elite employing the perspective related to neocolonial framework. For this approach these migrations will maintain to benefit their home country since money is sent home, migrants influence their home country policies, expatriates contribute to the development of their country by way of technology transfer even if they do not return to their country physically (Grubel, 1966; Grubel, and Scott, 1966; Johnson 1967; 1968; Watanabe, 1969).

This is considered as the starting process of the famous "brain drain controversy" (Das, 1971) where the internationalist and the nationalist of theoretical frameworks, each with its own economic approach, clash (Adams, 1968; Kiddleberger, 1977). For the



internationalist approach, the flow of brainpower to the countries of the North is a normal phenomenon in a global market since those countries provide maximum wages and productivity. Moreover, not only the North but also the South equally benefit from this flow of brainpower in the long term (Johnson, 1965). On the other hand, the nationalist approach supports their thesis in two main points. First is in an international economy, expertise is not equally distributed in that the North benefits from what is cruelly wanting in the South. Second is these migration flows are artificial in that they form a response to a selective migration policy of the importing countries whose direct objective is benefit (Amuzegar, 1968).

In this sense, Myrdal (1957) shares the similar belief with nationalist perspective. He claims that international labor migration widens, rather than narrows the inequality between the countries of origin and destination. Myrdal (1957) represented his argument in the theory of cumulative processes and considered migration in excess of job opportunities as both a symptom and contribution of under development. Thus, international labor migration deteriorates the economic development of the country of origin and increases the polarization between the country of origin and the country of destination.

The nationalist thesis was accepted as the basis for international policies, especially within the United Nations. Governments and international organizations were advised to collect information about related issues in order to prepare their position (Grubel, 1976). In 1974, this generated the United Nations Conference on Trade and Development (UNCTAD) term, 'reverse transfer of technology' (UNCTAD, 1974) which clearly places the problem within international cooperation policies. For this analytical model, which was developed, based on nationalist perspectives on brain drain, the flow of

the elite from the countries of the South, 'reinjects' in the industrialized countries, the benefits of aid that were originally granted to the South. This effort contributed some bases to the concept of reverse transfer of technology. After that the goal became to measure the loss and to find some way to figure it out.

### Some Measures for Eliminating Negative Effects of Brain Drain

In order to eliminate negative impacts of brain drain on origin countries, some scholars have offered several measures based on preventative, restrictive, retribute and compensatory measures. First, preventative measures were developed to stimulate the exporting countries to create a political, economic, scientific and social environment that could result in the flow of skilled people (Baldwin, 1970; Zahlan, 1977). Second, restrictive measures were also proposed in that some countries of the South were advised to introduce emigration regulations while, at the same time, the importing countries of the North were recommended to adopt immigration regulations to cancel former incentives offered to the highly skilled people of the South (Bohning, 1977). Third, the measures of restitution were advised to entail the return of trained professionals (the country of training was to encourage the temporary emigration of these intellectuals). Fourth and most famous compensatory measure was taxation (Bhagwati and Dellalfar, 1973; Bhagwati, 1976), which recommended surtax on the income of professionals who migrated from the less developed countries (LDCs) to the developed countries (DCs). In this case, the funds raised were supposed to be "routed through the United Nations to development programmes in the LDCs" (Bhagwati, 76:3).

However, these measures did not work as they were expected, due to three biases in the main theoretical approach. First, it was assumed all intellectual migrants left home

for economic reasons, which was not the case (Bohning, 1982; Glaser and Habers, 1978; Johnson, 1965, 1968). Second, there was a connection between the migratory flow and the flow of capital, products, salaries and prices (Salomon, 1973). Third bias was the difficulty in measuring the migration of the elite (vague definition of the term, no mechanism for observing their movement, available statistics not very reliable and not standardized). Such as while departures were partly recorded, returns were not. Therefore, the consequences of brain flow were highly overstated (Johnson, 1965).

In addition, there are several difficulties in the application of these measures to the issue of brain drain. The preventative measures were designed on the most radical principles since their objective was to keep elite at home by offering attractive salaries and stimulating a professional environment. However, these measures seemed to be more radical goal than transitional measures. The restrictive measures were no more successful and were almost inapplicable. In order to achieve their goal, neither the countries of origin want to seriously tighten their emigration rules, nor the countries of destination want to be obliged to change their immigration policies. Restorative measures seem ineffective because, they heavily depended on individual migration controls. In the application of these measures a specialist from the South went to the North, he had to return home. Failing this, a specialist from the North would have had to go to fill the intellectual gap for the individual who left his country of origin. Compensation measures primarily based on taxation were to reimburse the training cost of each non-returning trained emigrant and potential skill loss. These kinds of measures were organized by a new international fund to help develop the country of origin. However these measures did not work because of problems with statistical design and the collection systems (Mundende, 1989). Following nonstop discussions and many studies between 1973 and

1987, the “tax” option and the concept of “reverse transfer of technology” were left (UNCTAD, 1987).

### Brain Return, Diaspora Option, and Brain Circulation

Recently there have been three new approaches to the issue of brain drain: brain return, the diaspora option, and brain circulation. After the study on losses from migrations was dropped, during the 1980s the symmetrical concept of “brain return” or “return skills” was introduced (Gaillard and Gaillard, 1998). The little dragons of Southeast Asia are the most prominent of the “brain return“. In this sense, policies during the 1960s and 1970s were established for the systematic reintegration of nationals trained abroad. Among the “little dragons”, South Korea and Taiwan had the most determined repatriation policies (Chang, 1992; Yoon, 1992; Song, 1997).

However, during the 1960s and 1970s these policies were not so effective, such as in the S. Korea after the 1980s, many of the foreign-educated scientists and engineers returned home when the Korean economy continued to improve and the government adopted a new policy to utilize the expertise of Koreans abroad (Song, 1997). This example with other newly similar industrialized countries in the region proved that the return of highly skilled personal is strongly determined by three factors: country's economic development, the development of an effective national research system, and the quantity and quality of contacts between the country of origin and the expatriate intellectual diaspora (Gaillard and Gaillard, 1997).

The main purpose of diaspora option is to reconnect national intellectuals living abroad with the national intellectual community through scientific activities of common interests. Although it is not exactly based on a new policy, the systematic and multiple

contacts that can be built through the development of modern communication technology are newly fundamental characteristics of diaspora option. The more effective communication technology is used, the more people can interact with each other and exchange information. In recent years, some countries have tried to inventory, mobilize and organize their expatriate scientists and reconnect them with the scientific community in the home country such as Chile, Colombia, S. Korea, Ethiopia, India, Israel, Romania, Singapore, Taiwan and Venezuela. With its "Caldas Network" Colombia is the most prominent example to realize the reconnection of its expatriate intellectuals (Gaillard and Gaillard, 1998; Iradele, 1999; Coa, 1996). Similar to return option, diaspora option is one of the most efficient ways to struggle for the negative effects of brain drain, and to benefit from it. There has been an increasing consensus about this idea that through this way expatriate elites can contribute to the development of their home country. Such as people formerly believed nationalistic approach but now recognize the advantages of the external migration of the elite for their home country.

In this case, as a specialist and supporter of tax and compensation systems during the 1970, Bhagwati and Rao (1994) argue that the developing countries had changed their opinion. People with nationalistic view increasingly consider the emigration of their skilled manpower as an opportunity for them to gain distinction and contribute to the wealth of their nation. As a result, people have had a tendency to change their consideration about brain drain to the diaspora option (Bhagwati and Rao, 1994). Moreover, when the intellectual elite participate more in the active diaspora network and associations of the professional community in their home country, the situation became easy for them to make the decision to return to their home country (Song, 1997). Then by returning home the difference between the scientific/technical activities at the national

level and at the advanced level will decrease. After that these professionals will not only enrich national scientific communities, but will also provide bases to the maintenance and promising of the diaspora option itself (Gaillard and Gaillard 1998).

Instead of using the term brain drain for the description of the international mobility of highly skilled personnel, some researchers have been attempting to use different terms, such as brain circulation. Cao (1996) deals with the issue of international mobility of highly skilled personnel (HSP) in the context of globalization and considers this kind of mobility as a brain circulation rather than a brain drain. For him, this is an inevitable result of and necessary contributor to, the process of globalization. In order to enjoy certain benefits in the long term, less developed countries may have to lose their best brains and pay a certain price in the short term. Instead of blocking or hindering the international mobility of HSP as in the approach of many less-developed countries, the approach should provide a favorable environment that will attract HSP from both home and abroad to exploit brain circulation for the purpose of stimulating national development (Cao, 1996).

Saxenian (2002) reports that foreign-born scientists and engineers are increasingly visible as entrepreneur and senior managements in the U.S. More than a quarter of Silicon Valley's highly skilled workers are immigrants coming from different world countries as China, India Taiwan the United Kingdom, Iran, Viet Nam, the Philippines, Canada and Israel. These highly skilled immigrants are not displacing native workers; rather they foster economic development creating new jobs and wealth here and ties abroad. After coming to the U.S. they work a certain time and then some of them return to their home countries. If they stay in the U.S., they do not cut their relationships with their home country, they promote trade and investment with their home countries and

sent remittance to their families (Devan and Tewari 2001; Saxenian, 2002). They also support to establish new businesses in the U.S. and in their home countries and cooperate with them. They create social and professional networks to mobilize the information, know how skill and capital to start technology firms. In this base, instead of brain drain that the movement of skill and talent must benefit one country at the expense of another, Saxenian (2002) views the situation as brain circulation in that highly skilled immigration increasingly benefits both sides.

On the other hand, Devan and Tewari (2001) believe that this skilled migration will have lasting economic consequences on the developing world, robbing the skills of these workers and their influence on the productivity of others. Now more than ever, intangible capital (intellectual property and brands) rather than physical capital determines winners. Therefore, developing and holding highly skilled professionals is a fundamental long-term investment for any country. Nevertheless, for Devan and Tewari (2001), in the near future the reality is that emerging markets do not seem to create the necessary type and volume of economic opportunities to reverse or even substantially slow the brain drain. However, instead of viewing emigrants as totally lost resources, the governments can use that to promote economic growth. Such as the emigrants technical and business skills, commercial relationships and financial capital can be benefited to make long-distance economic contributions, and economic and educational exchanges (Devan and Tewari 2001).

#### The Issues on the Previous Studies: Data and Method

Although comprehensive data are very important for scientific investigation, the data collecting process in the field of brain drain is usually unreliable and incomplete.

Such as during the 1960s and early 1970s the statistical data seemed unreliable for analytical purposes. Brinley (1968) in his study mentions that “the statistical sources are incomplete”, based on which [he] was not able to make firm conclusions (p.29). In the same way, Myint (1968) argues in his report that “[there is] no reliable statistical information about total numbers involved in the brain drain from under developed to advanced countries as a whole (p.233). He tried to develop a general picture from the vague and imprecise information available on the subject.

During the early 1970s some studies criticized for the poor quality of statistical data used for brain drain research in the 1960s in that the statistical data were not only incomplete but also inadequate. In this sense, it is criticized that “ the available statistical data made no distinction between permanent and temporary immigration of high level professionals and were not clear about who was involved in the migration of high level professionals defined by occupation, training and/or by education (Hoek, 1970:15)

Thus, the early studies were criticized for the weaknesses of their statistical data in several respects. Such as, incomplete statistical data was the general characteristic of early studies; different researchers used different definition of data and content of data; researchers who used statistical data were dominantly international rather than national; the sources of data were limited in that the most data came either from the Immigration and Naturalization Service in the U.S. or from the international organizations in the United Nations, such as UNESCO, and United Nations Development Project (UNDP); and scholars used more quantitative data than qualitative data for brain drain.

Some authors argued the consequences of the lack of needed data. Hoek (1970) states that the shortage of reliable statistical data was one of the obstacles for an investigation of the size and nature of the migration of highly skilled manpower from



developing to developed countries. Based on inaccurate statistical data, it is very difficult to establish even an approximately correct picture of the flow of skilled manpower between developing and developed countries, or of its impact on the rate of development (Hoek, 1970). Due to these shortcomings in the available data and academic analysis, “many who participated in the public debate on the brain drain in the 1960s gave much speech to the expression of personal emotions and bias” (Oh, 1973:12). The weak statistical data were misleading so that it is impossible to make correct interpretations about the findings. This situation resulted in premature judgments and wrong conclusions about brain drain issue (Adams, 1969; Bechhofer, 1969; Bhagwati, 1976; Gruble and Scott, 1977).

When the area of brain drain studies develops, the quality of the statistical data also gets better. The brain drain studies during the 1970s and the 1980s focused more on whether statistical data can explain the complexity of the brain drain issue. In the course of that time, some researchers started to investigate the issue with a combination of statistical and descriptive data. In the 1990s qualitative data were increasingly used in the brain drain studies. However, qualitative data are not sufficient to provide necessary information about the global issue of brain drain, because it takes the issue based on individual micro level, but it ignores macro level structural bases of the reality.

At the beginning of the brain drain studies, research design was based on global designs at an international level. In their early studies, the researchers usually used five, six or more than seven countries (Adams, 1968; Hoek, 1970; Mcknight, 1971; Oh, 1973). On the other hand, some researchers dealt with only one country at the national level in their case studies (Coutsoumaris, 1968; Dandekar, 1968; Myers, 1972). Nonetheless, the global design at the international level was more common in the study of brain drain

during that time. According to literature, the goals of applying this kind of design was to investigate the size of global migration of high skill manpower, to find common causes of migration and to develop policies for the solution of the problem.

In the 1980s and 1990s, multinational design at the international level was dominant in the brain drain research. Changes in the design of brain drain studies took place when more studies were done in that field. Therefore, the main type of research design was shifted from many countries to fewer countries or to one country. Many studies focused on the national level in the 1980s and 1990s (Orleans, 1988; Metaferia and Maigenet, 1991; and Wang, 1993) as result of the unique situation of each country and the weakness in the multinational design at the macro level.

Most of the research conducted during the 1960s and 1970s did not give specific information about their research methods. This is because a large part of these researches represented a valuable personal and in some cases institutional experience but a small part of them were supported by empirical analysis and a correct formulation of the problem (Oteiza, 1968). One of the shortcomings of these works is the result from “most of the people who have written on the brain drain have been natural scientists, engineers, or educators witnessing a situation that they considered serious for their countries or their societies” (Oteiza, 1968:120). Thus, this systematic research approach for examining the brain drain issue was a major weakness of the early works.

After realizing that empirical studies were necessary, many researchers began to collect systematic data and adopt research methods from various social science disciplines. A large amount of studies conducted in the 1970s and 1980 used quantitative research methods. Thus, questionnaires were developed and distributed to various research subjects by mail. Most common types of studies were conducted at the

international level with multinational design by Education and World Affairs Council (1970), UNESCO (1971), and Rao (1979). The main advantages of the quantitative approach are to give more access to the researcher to get a large quantity of statistical data that can represent a broad picture and show the general magnitude of international brain drain. Since comprehensive data are vital to prove whether a phenomenon has created a problem, collecting large quantitative data was a necessary step in international brain drain researches. The data gathered through standardized questionnaire show common causes or factors shared by different countries or regions that have a brain drain issue.

However, this method was criticized based on several reasons. The major disadvantage of this approach is that the researchers determine the information needed in questionnaires, so that it is more likely that individual bias and presumption will impact the designed questions. The general statistical data collected based on a multi national design can usually ignore the particular situations in different nations. Thus making it difficult to generalize the results and provide standardized recommendations to all nations that have a brain drain issue

One of the more important quantitative works about Asian Brain Drain was conducted by Oh in 1968 and published in 1977 showed the strength and weakness of this approach. He prepared a specific questionnaire for Asian Students who were studying in the United States. He mentioned that while it was very helpful to collect the needed statistical data, his small-scale study suffered since he could not conduct follow-up interviews after collecting his statistical data.

When research on the brain drain improved, scholars and researchers adopted new research methods. Such as during the late 1980s and 1990s, the studies on the brain drain

issue centered on the national or regional level rather than on the international level. In addition, at the same time the studies combining qualitative and quantitative methods were shown more often in the academic studies. Such as Brezezinski (1993) studied on China's brain drain problem by conducting a qualitative approach. He states that previous studies with quantitative survey methods primarily "focused on student decisions to emigrate, return home, or temporarily delay returning home. [This] approach to understanding the phenomenon can only compare correlates of intentions. Reason behind intentions are hidden from survey/correlational techniques" Brezezinski 1993:55). For him an interview method gives subjects more access to tell their own story and provides a more complete framework to understand a respondent's migratory process.

During the 1990s there has been an increasing effort to employ both qualitative and quantitative methods in brain drain studies. These studies usually focused on student and scholars from a particular country such as Deng Zhiduen (1990) deals with China foreign educational policies; Wang, Wenchang (1993) takes care of class and ideology in Chinese migration decisions; and Metaferia and Maigenet (1991) focus on the effects on migration of the Ethiopian Revolution of 1974. These scholars believe that quantitative survey method is alone insufficient to study on brain drain so that they employed the field interview as a complementary method to collect data that cannot be gathered by mail surveys.

#### Macro Level Structural Analysis of Brain Drain

Based on a global perspective and using questionnaire surveys Glasser (1973) and Friborg (1975) attempted to determine factors that force professionals from the less developed countries (LDCs) and forces that attract them to the developed countries

(DCs). They concluded that the professionals are forced to leave their countries of origin because of low wages, unemployment and underemployment conditions, lack of research facilities, and other economic and political factors. The factors that attract them to the developed countries are the actual or perceived conditions of these factors.

Logan (1987) conducted an empirical investigation into reverse transfer technology (RTT) from seventeen Sub-Saharan countries to the U.S. between 1974 and 1985. Based on research findings, he concluded that RTT from a particular country in Africa to a particular country in Europe or North America is determined by one or more factors. These are the size of population of a sending country; professionals with pro-Western value politically and economically; colonization of professional's country; the official language and the language used in educational instruction; the political and economic factors in the home country.

Some scholars compare the brain drain of Central and Eastern Europe to the developed countries with the brain drain of developing countries and Western Europe to the developed countries after the WW II (Kallen, 1994; Gaillard and Gaillard 1997). In this base, first, they argue that Central and Eastern European countries as donors are not all deprived of scientific competence and tradition. Rather these countries are relatively technologically advanced, have a rich cultural heritage and have enjoyed in the past a relatively high standard of living. Second, in contrast to the flow of highly skilled manpower of developing countries, the emigrating academics of Central and Eastern Europe have already been well educated and highly trained and worked in their field and have acquired a high degree of competence (Gaillard and Gaillard 1997; Kallen, 1994). Based on these two characteristics, the migration of highly skilled people from Central and Eastern Europe is similar to that of Western Europe after WWII (Gaillard and

Gaillard 1997; Kallen, 1994). The difference from the Western European case is that the sudden and unexpected collapse of existing political and scientific structure of those countries. It is a consequence of a long period of confiscation, suppressed freedom of expression, rigid conditions and terms of work and research (Kallen, 1994). Another difference from the situation of most European countries after the war is that Central and Eastern Europe have been experiencing an exceptional process of transition and reconstruction that include all areas, political, economic, social, and cultural. But this situation is similar to those of most third world countries (Kallen, 1994). All these are important determinant factors of brain drain from Central and Eastern Europe to the other developed countries. As a result Kallen, (1994) claims brain drain is a loss of investment in earnings and in opportunities for reconstruction and transition toward a new economy and it also weakens countries capacity to mobilize themselves in favor of a new future.

Based on a world system perspective and using a multi national data set, Ong, Cheng and Evans (1992) conducted a descriptive analysis of migration of highly educated Asians to the U.S., Canada and Australia. They linked the migration of highly educated Asians to the developed countries with broader global process regarding global articulation of higher education and unequal development at a global scale, and the contribution to economic development of the reverse flow of high level manpower to less developed countries. They argue that although the global articulation of higher education and the formation of international division of labor are preconditions for the movement of high skill manpower, global inequality is the fundamental determinant of economic incentives for individuals to leave a less developed country for an advanced country. Such as differences in living conditions as wage and career opportunities have a positive impact on in the size of movement of highly skilled manpower. However, in contrast to

common belief that differences in development levels among the countries result in high level of professional migration from less developed countries to developed countries, they concluded that relatively wealthier Asian developing countries are a bigger source of professional migration. In this sense they believe that development provides necessary preconditions for out migration in terms of high level integration with Western institutions of higher learning, greater contact and exchange, and imbalances in the labor market (Ong, Cheng and Evans, 1992).

On the other hand, using international and national data sets, Portes (1976) brings a causal explanation to the brain drain issue. He tries to combine push pull factors with the dependency theory in his analysis and claims that professional migration is the consequence of three factors. First is a consequence of international imbalances between two countries in that developed countries offer more attractive payments, work facilities, social standing and general life conditions. Second is the consequence of internal structural imbalances in that supply of professionals produced by educational system of society is more or less than internal demand for their services. Third is the consequence of individual differences in terms of an individual's past training and achievement, current situation, and network of social relationships of individuals. The result is "the best trained, less encumbered, and more encouraged to leave person is, the greater the probability of emigration" (Portes; 1976:504). He concludes that the variation in emigration rates among countries at similar development levels is not entirely determined by absolute national wealth or economic growth. Some industrialized countries also lose their highly skilled human power. Thus the main factor is not wealth but balance between the major subsystems of the society (Portes, 1976).

Based on a recent trend to connect the flow of highly skilled manpower to broader global processes, Cheng and Yang (1998) proposed that cross-national variation in the size of highly trained migration can be better explained by both global interaction and global inequality between two countries because both of them are main components of global integration process. Using structural equation models based on a cross-sectional design including an international data set with 104 independent countries, they examined structural determinants of highly skilled migration to the U.S. in 1988. They found that economic and educational articulations between sending countries and the U.S increase the size of highly trained migration to the U.S. Their results also partly supported their hypotheses that inequalities between sending countries and the U.S. in living conditions, research conditions, children educational opportunities, political conditions, and professional employment opportunities promote highly skilled migration (Cheng and Yang, 1998).

### United States Immigration Policy

It is necessary to give some information about the history of immigration to United States in connection with the current U.S. immigration policy. Isbister (1996) mentions that more than 60 million immigrants have come to the United States two-third of them were European. He identifies four immigration waves to the U.S. based on numbers of immigrations and their ethnic origins. First wave is between 1607 and 1820s that began with the first attempt at English colonization in Virginia and lasted through the early years of the new public, to the 1820s. Although the white immigrants were predominantly English, significant groups of Scots, Irish, Dutch, Germans, Swedes and



French also arrived. The importation of African slaves begun about 1700; but after 1807 the slave trade continued through the Civil War.

Second wave covers time from 1840 through 1870. During this period about 15 million immigrants entered the country. The English no longer predominated because Ireland and Germany became the leading source countries. With the annexation of the Southwest, several hundred thousand Spanish speakers became Americans. On the other hand Chinese immigrants arrived at California.

Third wave refers to the period from 1880s to 1920s. During this time about 25 million immigrants entered the United States, but the traditional sources, England, Ireland and Germany, were now supplemented by southern and eastern Europe. The United States took in Italian, Poles, Greeks, Russians, Jews, and Austro-Hungarians. However during this period opposition existed to some immigrations, such as the Chinese Exclusion Act the first legislation to restrict immigration was passed in 1882. During the 1920s a series of laws cut immigration back significantly and biased it in favor of northwestern European origins. About 50 percent of all immigrants entering the country between 1951 and 1960 were from European countries, compared with only 27 percent from North America and 6 percent from Asian nations. A new immigration law passed by congress in 1965, eliminating a bias toward Northern European countries that many legislators considered racist (Gimpel & Edwards, 1999).

Fourth wave refers to from 1965 to the present. In this period the flow of immigration is drawing the figures of third wave. The sources are completely different from before because prior to 1965 immigration law was heavily biased on European countries. In this sense, the recent immigrants include only 13 percent of European sources, but the largest numbers come from Mexico. And other Central and South

American, Caribbean and several Asian countries send the largest numbers. Moreover, immigration into the United States is now predominantly from the third world countries (Isbister, 1996).

There were some important events that had important effect on increasing immigration numbers to the U.S. Such as, by the early 1960s American attitudes toward ethnic minorities had become more tolerant than ever before. The Civil Right movement had culminated in the passage of the Civil Rights Act of 1964 and Voting Right Act of 1965. During that time overt racism could no longer be tolerated in the way citizens treated each other, the apparent racist nature of the prevailing immigration laws, which discriminated against other immigrants by favoring those from northwestern Europe, was increasingly becoming unacceptable to the American people. Moreover, the fear of depression faded as the postwar prosperity continued, dampening opposition to immigration (Yang, 1995).

Under these conditions the immigration and Nationality Act of 1965 was passed on October 3, 1965. This act abolished the discriminatory national origins quota system while attempting to control immigration at a manageable level. Such as Eastern Hemisphere was set as annual ceiling of 170,000, with a maximum of 20,000 immigrants for each country regardless of size. For the first time, an annual ceiling of 120,000 was imposed on Western Hemisphere, whereas there were no numerical limits for each country. Thus the combine total annual worldwide ceiling was 290,000 each year, and applicants were admitted on a first-come, first-service basis. In order to determine the eligibility of applicants from the Eastern Hemisphere, a seven-category preference system was created whereas the system didn't apply to the Western Hemisphere. Family unification became the fundamental basis of U.S. immigration policy. In addition non-

quota immigration or immediate relatives were not considered as part of either hemispheric or country ceiling. On the other hand, refugees from both hemispheres were allocated only a small number of visas (Yang, 1996). The 1965 act was set to take effect on July 1, 1968 and it has built the basic structure of current immigration policy.

The imposition of the first ceiling on immigration from the Western Hemisphere in 1968 engendered a huge backlog of applications for visas from the countries in that region. Through 1976, 300,000 visa applications from these countries were pending due to a long waiting period. Moreover, the implementation of the 1965 act in mid-1968, immigration from Mexico had annually exceeded the 20,000 per country limit by at least 20,000. Such as in 1974, 45,364 out of the 120,000 total visas for the Western Hemisphere had gone to Mexican applicants. If the relatives of these applicants were taken into account the total number reached 71,586 (Yang, 1995). In order to figure out this problem the 1976 amendment was adopted. With this, the Eastern Hemisphere countries, seven-category preference system had been applied to Western Hemisphere countries and for the first time an annual ceiling of 20,000 immigrants from any single Western Hemisphere nation. Thus, it was a manifestation that people from all countries should be considered equally in terms of equal opportunity to immigrate to the United States.

Another important amendment to the immigration and Nationality Act of 1965 was enacted, which finally set a unified immigration system to merge two hemispheric ceiling into a single worldwide quota of 290,000 visas each year. In this base, the amendments of 1976 and 1978 eliminated all discriminatory provisions based on nationality and the new immigration system applied the same admission requirements t

the nationals of all countries. So that through the end of 1970s the legal U.S. immigration system used a single policy that applied uniformly to the people of all countries.

In 1980 Congress passed the Refugee Act of 1980 so that it single out refugees from domination of the existing immigration policy and enacted a separate admission policy for them. It canceled the seventh preference category for refugees and reduced the annual worldwide ceiling to 270,000 immigrants and set a separate worldwide ceiling of 50,000 for refugees for each year through 1982.

In order to control and deter the massive scale of illegal immigration, congress established the Immigration Reform and Control Act (IRCA) of 1986, this act provided amnesty and temporary resident status to all illegal aliens who had lived in the United States continuously since January 1, 1982.

The Immigration act of 1990 set up the current U.S. immigration system, which is a modification and expansion of the previously existing immigration system in operation since 1965. The most important characteristic of this act is a significant increase in the total level of legal immigration from level at the time of its passage to 700,000 persons for fiscal years 1992-1994 and 675,000 persons in 1995 and thereafter. Thus, the first time it placed a yearly cap on total immigration, including both numerically limited categories and numerically exempt categories.

There are two important trends resulting from the post-1965 immigration reform. First, there has been a substantial increase in the number of immigration. In the course of 1966-1989, more than 12 million immigrants were admitted, these account for almost 5 percent of the total U.S. population enumerated in the 1990 census. The average number of immigrants admitted during this time was 506,927, which was about 2.4 times as large as the number of 214,144 for the period of 1921-1965 (Yang, 1995). More specifically

during 1980s the average annual influx was 633,222 immigrants regardless of illegal immigration. Foreign-born population as share of the total U.S. population increased from 5.5 percent in 1960 to 6.2 percent in 1980, 7.9 percent in 1990 and 10 percent in 1998 (Borjas, 1999: 41). And the number of persons granted legal permanent residence in the U.S. increased to nearly 850,000 in 2000 from 646,568 in 1999 (INS, 2002) Thus, immigration has played an important role in growth of the U.S. population and labor force.

Second, the source of immigration has changed. Although immigration from Europe was the major source of immigration before 1965, the level of immigration from Europe has gradually decreased since 1965. Immigration from Asia and Latin America has steadily increased since 1965 and these two regions have become dominant sources of immigration. Moreover, during 1978, Asia began to lead Latin America immigration sources. In this case, Asians have applied to several ways to get their admissions (Yang, 1995). First, they benefited from unused-pooled quotas. In the transition period under 1965 act from 1965 to 1968, the old quotas remained in effect, but unused portion of quotas was placed in pool and made available, regardless of national origin, to persons from countries whose quotas were filled. Many Asians such as 38,000 Chinese, 22,000 Filipinos, 10,000 Indians and 3,500 Korean came using these pooled quotas. Second family unification was another channel for a significant number of immigrants arriving during the transition period and the historical stocks of some Asian groups, such as Chinese, Japanese, Indians, and Filipinos. Third way is adjustment of refugee status. Between 1975 and 1985, almost 600,000 Indochinese refugees from Viet Nam, Laos Kampuchea were admitted. Fourth, occupational preferences were important factors to increase Asian immigration into the U.S. Chin-Taiwan, India, the Philippines, and Korea,

which have sent large number of scientists, engineers, doctors, nurses, postsecondary teachers, and other professionals, have made significant use of the occupational preference categories. Many of these immigrants were foreign students who adjusted to immigrant status.

## CHAPTER III

### THEORETICAL FOUNDATION OF THIS RESEARCH

This research investigates the proposition that cross-national variation in the size of highly educated migration to the developed countries from all world countries in general, and less developed countries in particular, can be explained through interaction and inequality between immigrant sending and receiving countries and the process of global integration. When the globalization process accelerates, interactions between developed and developing countries are intensified. However, in some respects globalization process carries out and even increases national differences in development. The intensified cross-national connections and the persistent cross-national inequalities together account for differences in the volume of migration of highly educated to the developed countries.

Currently there have been increasing economic and cultural interactions among the countries. Two of them are important subject matters for this study. First is the increasing economic interdependency among countries especially between more developed countries (MDCs) and less developed countries (LSCs). It is expected that the closer economic connection between a sending country and the United States results in the higher level of professional migration to the United States (Ong, Cheng and Evans, 1992; Cao, 1996; and Cheng and Yang, 1998). Second is the growing articulation of higher education. In this situation, the more educational articulation between the United

States and immigrant sending countries creates a higher amount of professional immigration to the United States (Ong, Cheng and Evans, 1992; Cheng and Yang, 1998). Although global interactions in economic and higher education across countries produce necessary conditions for migration of professional, this alone is insufficient to cause brain drain. Inequality in developmental levels across-nations creates motivations for the highly trained people of sending countries to emigrate. It has been proposed that differences between sending countries and the United States in the conditions of living, work and research, and professional employment opportunities are main determinants for cross-national variation in the levels of migration of the highly skilled manpower to the United States (Oteiza, 1971; Portes, 1976; Ong, Cheng and Evans, 1992; Cheng and Yang, 1998). The larger the differences in development between sending countries and the U.S. results in the higher the level of professional immigration to the U.S.

In sum, international interaction and international imbalances together generate the fundamental structural conditions for brain flow. It is hypothesized that factors related to global integration and those related to global inequality are basic determinants of cross-regional and cross-national variation in the size of professional migration to the developed countries.

### Some Theoretical Perspectives about Brain Drain

There is no well-developed theory to adequately explain the brain drain problem. This is primarily due to the lack of both factual information and the need for agreed-upon theoretical framework for approaching the issue. Based on previous brain drain studies, Oh (1977) mentioned, “while empirical work sheds light on the quantitative importance of any facts, we have found that nearly all discussions of the brain drain and exchange



student programs suffer most seriously from the absence of a theoretical framework” (p. 11). In the same way Iredale (1999) argues that in the late 1990s no one theory or typology explained skilled migration. In this sense, there is an obvious complexity such as most research has centered on professional, managerial, and technical level occupations while trade level and other skilled workers have not been taken into account.

Since the brain drain problem is complicated and related to many aspects of the lives of individuals as well as to the overall development of receiving and sending countries, a single theory will not explain adequately all aspects of the phenomenon. Therefore, it has been suggested that inter-disciplinary theory or cross-disciplinary theory should be introduced in the field of brain drain study.

Although there are a large number of theories about brain drain, this research deals with only five of those theoretical perspectives for the purpose of this study in this section. These are human capital theory, supply and demand theory, push and pull theory, development theory, and world systems theory. These theoretical perspectives are neither mutually exclusive nor collectively exhaustive. Rather they supplement each other. Each of these perspectives is briefly reviewed in the following section.

### Human Capital Theory

Theory of human capital considers formal education of individuals as an investment in the person. The rate of return on the investment should be estimated and measured because it will effectively impact the individual’s economic decisions. This theory focuses on two major kinds of return on educational investment. One type of return is the rate of social return or the nation’s economic growth; the other is the rate of

private return, namely the income of the individuals, sometimes referred to as marginal productivity, after they finish their education (Becker, 1964).

Human capital theory claims that a person will emigrate when he perceives that the expected marginal productivity in the host country would be greater than that in his home country: the person would not migrate if the marginal productivity were smaller than in his home country or even equal value (Wang, 1993). Thus, human capital theory brings a new perspective on the phenomenon of the international “brain drain” migration. It clearly depicts the relationship between the investment in human resources and return on the investment for both the society and the individual. Therefore, it can influence the individual’s and the society’s economic decisions. This theory also differentiates the special features of human capital from those of physical capital and separates their roles in economic growth and social development. In addition “it also provides an economic explanation of the brain drain problem that cannot be explained by aggregate statistical data” (Wang, 1993:7). Human capital theory was a very popular theory to explain brain drain issue during the 1960s and 1970s. Since T.W. Schultz and Gary Becker developed the concept of human capital and human capital approach to brain drain studies in early 1960s, [between 1960s and 1970s], research [with the human capital approach] was nearly the only kind of materials available concerning the brain drain to the United States” (Oh, 1977:11).

However, the human capital theory has some shortcomings. First, although it explains the economic gain for the individuals who migrate from developing countries to the more developed countries, it is not sufficient to express the complexity of the brain drain problem, especially when non-economic factors are involved. Second, it does not explain total cost and benefit of the international skilled manpower migration because it

is neither comparable nor measurable in dollars. Third, it fails to explain the phenomenon of complex migration decision making process and decision-making behaviors.

### Push and Pull Theory

Traditional push and pull theory has been employed widely to explain the brain drain issues since the 1960s. Using push and pull theory the researchers have tried to answer the questions dealing with international brain migration by analyzing two sets of different factors, namely push and pull factors. The pull factors indicate to those attractive aspects (such as high salary, job opportunities, better living conditions, etc.) in the receiving region that induce individuals to migrate there. On the other hand, the push factors refer to a series of unfavorable factors (such as unemployment, political instability, and inadequate facilities for research, etc.) in the country of origin that generates emigration. Thus, cross-national brain drain is a result of the interaction and reinforcement between push factors from home and pull factors from abroad (Huang, 1984: 60).

The researchers of this approach center on identifying the two kinds of factors and attempt to prove if those individuals who are involved in brain flow make their decisions to stay in the host countries by weighing the relative importance between the two different forces. The importance of this theory is due to its openness and flexibility because “almost all factors advocated by different disciples can be accommodated and grouped into push and pull factors” (Huang, 1984: 60). For instance, this theory can delineate not only general material and tangible push and pull factors (such as income, job opportunities, facilities for research, working and living conditions, etc.) but also the non-material and non-obvious push and pull factors (such as feelings, attitudes, values

and perception, etc.) that have an impact on the migration decisions made by highly trained personnel.

In his study Rao (1973) tried to further develop push-pull theory. He suggested that researchers look at the two different forces in both sending and receiving countries because he believes that both sending and receiving countries have push and pull factors. Thus, an individual's decision on staying in the host country depends on how each individual deals with the two sets of forces. For some people, the pull factors in the host country are much stronger than that in the home country, so they prefer to stay after they complete their studies, while for some people pull factors in their home country are stronger than that in the host country, so they prefer go back (Rao, 1973: 135-137).

However, this push-pull theory has also some deficiencies. Such as it is not able to account for the inter-relationships among different factors when potential migrants are facing the coexistence of the push and pull forces in the host country. In this sense, "push and pull theory can only provide a partial, but not a whole picture of the migration of high level manpower at a unit by unit level" (Brzezinski, 1993: 36). This theory also complicates a clear distinction between common and special factors that influence migration decisions. At individual level, the theory does not bring sufficient explanations why some individuals stay overseas while some go back to their home countries when there is an equal opportunity to stay. "What happens when one factor carries more weight in an individual's decision?" (Brzezinski, 1993: 36).

### Supply and Demand Theory

Supply and demand theory has been widely used for research in the social sciences. It was also employed for the studies of the brain drain issue in the 1960s and

1970s. Regarding this theory, most of the developing countries “have been led... that the principal institutional mechanism for developing human skills and knowledge is the formal educational system. [That is] the more education, the more rapid development” (Todaro, 1989:330). The rapid expansion of higher education in certain developing countries produced a supply of certain kinds of highly educated professionals that are larger than the economic systems of those countries can absorb.

The imbalance between supply and demand in developing countries pushes the over-supply graduates to emigrate. On the contrary, the developed countries have a high demand for highly trained personnel; a demand that continues to grow more quickly than their educational systems can produce trained graduates. Therefore, the developed countries accept highly qualified manpower from developing countries. Hence, theories of supply and demand contribute to the explanations of the migration of highly trained personnel.

However, some argue that supply and demand theory cannot explain why, when highly educated people are in high demand at home, out migration occurs anyway. Such dynamics took place in Great Britain in the early 1960s and later in the People’s Republic of China in the 1980s and the 1990s. It is believed that supply and demand theory can only superficially explain intellectual migration. In this matter, Oh (1977: 15) mentions, “[It is obvious that] such a wide ranging study of the migration of highly trained manpower would require a multi-disciplinary approach” that means only one theory cannot explain the issue of brain drain.

## Development (or Modernization) Theory

The most common explanation about cross-national variation in migration is made by development theory (also known as modernization theory), which had dominant impacts on the international migration studies until the mid-1970. Essentially the development theory claims that every society is located at certain stages of development and will transform from traditional to modern societies or from a lower level of development to a higher level of development. Based on different stages of development, migration goes from less developed societies to more advanced ones.

This theory argues that the underlying cause of cross-country migration, especially from less developed countries to more developed countries is the underdevelopment of sending societies. (e.g., Hofstetter, 1984; Lamm and Imhoff, 1985). Development theory would predict that countries with lower levels of development would have higher levels of immigration to the United States than countries with higher levels of development (Yang, 1995). The vital solution to the problem of increasing immigration is to boost the level of development in sending countries. Consequently, some proponents of development theory (e.g., Hofstetter, 1984; Lande and Crigler, 1990) have suggested that one important way to promote development and reduce the level of immigration from large immigrant sending countries is to increase foreign investment in the sending countries and promote their trade with advanced countries. As a result development theory connects immigration with the domestic development of sending countries and claims that cross-national inequalities in the level of development are main factors for migration.

However, this theory has some limitations in explaining cross-national variation

in migration. First, some empirical evidence based on single country case studies challenges the claim of development theory that such development problems as overpopulation, economic stagnation and poverty determine immigration. For instance, although most African countries have serious development problems, they have lower levels of immigration than some other developed countries. Second, an exclusive focus on factors of sending countries is single-sided and does not catch some important elements in the immigration process. Third, development theory does not consider broad international context of immigration as important and it neglects the relationship between the flow of people and the cross-national flows of capital, commodities, technologies, and information.

### World System Theory

After development theory lost its popularity, dependency/world system theory emerged in the late 1970s as an alternative theorization of the international migration process, which attempts to overcome the problems of development theory (Yang, 1995). World system theory views the constantly changing capitalist world system as the causes of international migration (Petras, 1981; Cheng and Bonacich, 1984; Portes and Bach, 1985; Sassen, 1988). World system theorists deal with immigration in global, political, and economic contexts and see cross national differences in the size of immigration to the developed countries as the results of varying degrees of their economic political, and military involvement in sending countries (Light and Bonacich, 1988; Sasses, 1988).

According to world system theorists, there is usually a positive relationship between developed countries' involvement in sending countries and the size of immigration to those developed countries. In contrast to the prediction of development

theory, world system theory claims that foreign investment in and trade with sending countries will increase immigration. World system theorists also recognize the effects of underdevelopment on emigration, but they consider underdevelopment in sending countries as part of a more complex picture. They consider the development of sending countries as an intervening process, which is influenced by developed countries' intervention (e.g., Sassen, 1988).

Nevertheless, like the previous theories, world system theory has some problems in fully explaining migration issues. The most obvious limitation of world system theory is that it tends to reduce immigration to a unidimensional process of uneven economic exchange between countries of origin and countries of destination (Zolberg, 1981). It primarily deals with economic variables and considers immigration largely in terms of the international process of capital accumulation, but pays less attention to social factors.

However, although modernization theory and world system theory have some shortcomings for the explanation of the professional migration from one country to another, among the all other theoretical perspectives these two perspectives together seem more efficient to express the brain drain issue using structural variables for the purpose of this research.

### Theoretical Concepts of the Research

The research examines several concepts that are defined and described in the following ways. The concept of professional migration refers to the movement of people, who have a higher education and professional skills, from an origin country to a destination country. In this base, professional group indicates to the group of professional specialty and technical occupations, with executive administrative and managerial



occupations based on the classification of Immigration and Naturalization Service, 2002. The size of professional migration is the main indicator of the global concept of 'brain drain'. The size of professional migration is measured as the total number of professional immigrants admitted from a sending country to the U.S. within a fiscal year. In this study, professional migration is used interchangeably with the terms of migration of professional, migration of the highly trained, migration of the highly educated, migration of the highly skilled, brain flow, the flow of high level manpower, the movement of the highly skilled personal, and brain drain.

Another concept is the concept of cross-national interaction that is typically described and defined in the research as integration and interdependence of the world economy and the growing articulation of higher education. In this point, economic interdependency has four indicators. These are a total amount of export from the U.S. as a receiving country to a sending country, a total amount of import to the U.S. from a sending country, a total amount of direct investment of the U.S. in a sending country, and a total amount of direct investment of a sending country in the U.S. as a receiving country within one fiscal year. Educational articulation means that one of the countries receives students from the other who matriculate at schools and universities in the receiving country. For this research, the total number of students in the higher education institutions of the United States from a sending country is considered as a main indicator of the educational articulation. Thus, cross-national interaction involves both economic exchange and educational articulation. The primary indicators for these concepts in this research involve secondary data from several sources

The present research also examines the concept of cross-national inequality that is defined as international imbalances, which permit developed countries to offer more

attractive living conditions, work and research conditions, and professional employment opportunities to those whose skills and knowledge they need. In this sense, cross-national inequality has five indicators. These are the difference in life expectancy at birth, the difference in per capita gross national product (GNP), the difference in gross enrollment ratio (GER) in education, difference in expenditure for research and development as percentage of GNP, and difference in professional unemployment ratio between the U.S. and a sending country. The indicators of cross-national inequality concept in this study involve secondary data from several resources.

### Research Questions

Based upon the past research and the review of literature, this study deals with the following major research questions: What are the relationships of professional migration to the U.S. with cross-national interaction and cross-national inequality between professional immigrant sending countries and the U.S? Are there any differences among all the world countries and regions in sending different volumes of professional immigrants to the U.S? What are the effectiveness of world system theory and development (modernization) theory in explaining professional migration in connection with cross-national interaction and cross-national inequality between immigrant sending countries and immigrant receiving country in the case of the U.S.?

Main research theory is that cross-national interaction and cross-national inequality between immigrant sending countries and immigrant receiving countries are closely associated with the variation in the volume of professional migration from all world countries to the United States.

## Main Research Hypotheses

In connection to the main theory there are two main hypotheses. First is that cross-national interaction based on economic interdependency and educational articulation is more likely to have positive relationships with the size of professional migration from a sending country to the U.S., the following specific hypotheses are developed to explain the associations between the categories of economic interaction and educational articulation of a sending country and the size of professional migration to the U.S.

- a) The higher export from the U.S. to a sending country the more likely to have a positive correlation with the number of professional migration from a sending country to the U.S.
- b) The higher import of the U.S. from a sending country the more likely to have a positive relationship with the amount of professional migration from a sending country to the U.S.
- c) The higher the volume of U.S. investment in a sending country the higher the size of professional migration from a sending country to the U.S.
- d) The higher the level of investment of a sending country in the U.S. the higher the amount of professional migration from a sending country to the U.S.
- e) The more the educational articulation between a receiving and a sending country the more professional migration to the receiving country. Thus, a foreign country with the higher number of students in

the higher education institutions of the U.S. is supposed to send more professional migrations to the U.S.

The second main research hypothesis is that cross-national inequality between a sending country and a receiving country in terms of the differences in living conditions, job and research conditions, and professional employment opportunities are more likely to be positively correlated with the higher amount of professional migration from a sending country to the U.S. In this base, the following specific hypotheses are developed to detail the relationships between the components of cross-national inequality and the size of professional migration.

- a) The higher the difference in life expectancy at birth between the U.S. and a sending country the higher the amount of professional migration to the U.S.
- b) The higher the difference in per capita gross national income between a sending country and the U.S. the higher the amount of professional migration to the U.S.
- c) The higher the difference in gross enrollment ratio of combining primary, secondary and tertiary education between the U.S. and a sending country the more likely to have a positive relationship with the volume of professional migration to the U.S.
- d) The higher the difference in the job and research opportunities between the U.S and a sending country in terms of expenditure for research and development as the percentage of gross national product the more likely to have a positive correlation with the size of professional migration from a sending country to the U.S.

- e) The higher the difference in professional employment opportunities as the ratio of total number of professional unemployment to the total number of occupational unemployment between a sending country and the U.S., the higher the volume of professional migration from a sending country to the U.S.

## CHAPTER IV

### METHODOLOGY

#### Data

This research is based on a longitudinal design dealing with the year 1990 and 2000, and uses a total of 221 countries for each year in the analysis. The unit of analysis is the nation state. After the initial descriptive analysis of data on all the countries using a few variables, the study focuses on several selected groups to examine primarily the relationships between macro level structural factors of immigrant sending countries and the volume of their professional immigration to the U.S.

Several existing data sets are utilized in this research. The data on migration, economy, education, development, unemployment and population come from several national and international sources. Each of these sources is listed and described below.

#### Sources of Data

Immigration data for fiscal year 1990 are based on Statistics Division of the U.S. Immigration and Natural Service unpublished documents “Detail Run 408 Immigrants Admitted by Country or Region of Birth and Major Occupation Group”, and “Detail Run 408L. Legalized Aliens Admitted by Country or Region of Birth and Major Occupation Group.” The reason for this source is that published INS Statistical Yearbook of 1990 did

not include countries with smaller number of immigrants, and it grouped those countries as “other Europe,” “other Africa,” “other Asia,” etc., so that this situation reduced significantly the number of cases available for the analysis. Immigration data for fiscal year 2000 are based on U.S. Immigration and Naturalization Service, Statistical Yearbook of the Immigration and Naturalization Service 2000, 2002 that included all the world countries.

U.S. Export and Import data during 1990 came from U.S. Bureau of the Census, Statistical Abstract of the United States 1993, 1993 and on the world wide web at <http://www.census.gov/foreign-trade/balance/index.html#B> (November 19, 2002). U.S. Export and Import data during 2000 came from U.S. Bureau of Census, Statistical Abstract of the United States 2001, 2001 and on the world wide web at <http://www.census.gov/foreign-trade/balance/index.html#B> (November 19, 2002). In original data source Z is used to refer to less than \$500,000 for U.S. Export and Import data but for this research Z is accepted as \$250,000 value.

U.S. Direct investment abroad data during 1990 and 2000 based on detailed annual balance of payments and position estimates 1982-2001 zipped files of International Investment Division of Bureau of Economic Analysis of U.S. Department of Commerce on the world wide web at <http://www.bea.doc.gov/bea/di/di1usdbal.htm> (October 31, 2002).

Foreign direct investment in the U.S. in 1990 data were from detailed annual balance of payments and position estimates 1987-1999 zipped ASCII files of International Investment Division of Bureau of Economic Analysis of U.S. Department of Commerce on the world wide web at <http://www.bea.doc.gov/bea/di/di1fdibal.htm> (September 26, 2002). Foreign direct investment in the U.S. in 2000 data were from

country detail for position, capital flows and income 1997-2001 of International Investment Division of Bureau of Economic Analysis of U.S. Department of Commerce on the world wide web at <http://www.bea.doc.gov/bea/di/di1fdibal.htm> (September 26, 2002). In original data source for some countries (\*) indicates a value between \$500,000 and -\$500,000 for U.S. Foreign Direct Investment and Foreign Direct Investment in the U.S. but for this research it is accepted as 0 (zero) value.

Data about the number of foreign students in the U.S. from all world countries during the 1989/1990 came from Open Doors 1989/1990 Reports on International Educational Exchange, The Institute of International Education 1990. Numbers of foreign students in the U.S. from all world countries during the 1999/2000 data were from Open Doors 2000 Reports on International Educational Exchange, The Institute of International Education 2000.

Life expectancy at birth for each country during 1990 were based on Human Development Report 1993 of United Nations Development Programme (UNDP), 1993; and during 2000 were based on Human Development Report 20002 of UNDP, 2002; missing data from these two sources were completed from population data based on world population prospect of U.N. population division on the world wide web site at <http://esa.un.org/unpp/index.asp?panel=1> (December, 2002).

Gross National Income (GNI) per capita data during 1990 were based on World Development Report 1991, World Bank 1991, World Development Report 1992, World Bank 1992, and World Development Report 1993, World Bank 1993. Gross National Income (GNI) per capita data during 2000 were based on World Development Report 2002, World Bank 2002. However, for some countries Gross National Income (GNI) per capita data during 1990 and 2000 were given as an income group instead of exact dollar



value as lower income, lower middle income, upper middle income and high income group, but for this research all low income group countries are considered having the mid point of this income group. In similar ways for all lower middle and upper middle income group countries, the midpoints of dollar value of these groups are used, but for higher income group countries the lowest value of this group was employed.

Table 1: Per Capita Gross National Income (GNI) Groups Based on Dollar Values for Some Countries

Year	Low income		Low middle income		Upper middle income		High income	
	Given	Accepted	Given	Accepted	Given	Accepted	Given	Accepted
1990	610 or less	305	611-2465	1538	2466-7619	5043	7620 or more	7620
1991	635 or less	318	636-2555	1596	2556-7910	5233	7911 or more	7911
2000	755 or less	378	756-2995	1876	2996-9625	6311	9266 or more	9266

Gross Enrollment Ratio of combined primary, secondary and tertiary education of each country whose population exceeds 150,000 data during 1990 was based on UNESCO Statistical Yearbook 1999, 1999. Gross Enrollment ratio of combined primary, secondary and tertiary education of 1999 data was based on Human Development Report 2002 of UNDP, 2002.

Expenditure for Research & Development as a percentage of gross national product (GNP) data for the 1990 came from UNESCO 1999 Statistical Yearbook, 1999; and data for the year 2000 came from UNESCO Institute for Statistics of Science and Technology selected indicators data for 1996-2000 on the world wide web at [http://portal.unesco.org/uis/ev.php?URL\\_ID=5180&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201&reload=1038209836](http://portal.unesco.org/uis/ev.php?URL_ID=5180&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1038209836) (November 2002).

Unemployment data by professional level, by occupational levels and by general level during 1990 and 2000 came from International Labor Office Database on Labor Statistics of International Labor Organization Bureau of Statistics, LABORSTA on the world wide web at <http://laborsta.ilo.org/cgi-bin/brokerv8.exe> (December, 2002).

The total population of each country during 1990 and 2000 was based on United Nations Economic and Social Affairs World Population Prospects the 2000 Revision Volume I: Comprehensive Tables, 2001, and the countries whose population was less than 140,000 came from the population data of the U.N. Population Division World Population Prospect, 2002 on the world wide web at <http://esa.un.org/unpp/index.asp?panel=1> (December, 2002).

### The Limitation of Data

There are several important limitations of the data. Since the data were collected from different sources for all the world countries with different levels of economic, social and political development, it was not possible to find complete data about all the world countries apart from migration data. Especially the small and least developed countries were missing a certain part of their data because they either do not have an efficient system or an institution to collect those kinds of data in their countries.

During the two time periods of 1990 and 2000 some countries collapsed such as the former Union of Soviet Socialist Republics (U.S.S.R.) and former Yugoslavia, other countries existed like Central Asian countries such as Kazakhstan, Azerbaijan, Uzbekistan, and some countries were reunified for example West Germany and East Germany reunified as Germany and Yemen (Aden) and Yemen (Sanaa) reunified as Yemen. In this study if the two countries were reunified during or after 1990 they are considered as one country and their data were combined together for all categories. If the countries existed between 1991 and 1995, the closed years were taken to get enough data about those countries for the year 1990. On the other hand, if a country was missing values, the values of adjacent year from the same source were used.

The data about the unemployment levels and the expenditure for research and development as percentage of GNP are missing for many countries, which resulted in many countries being eliminated in the analysis that considerably decreased the representativeness of the data and the significant levels of measurement of associations.

### Descriptions and Measurements of Variables

There are four groups of variables. The first three are main variable groups as migration variables, cross-national interaction variables, and cross-national inequality variables, and the last one is a kind of a control group based on unemployment and population variables.

*Migration variables* consist of one primary variable as the professional migration and two general variables as nonprofessional migration and other migration for bivariate descriptive analysis of percentage distributions of migration variables across the components of five categorizations of all the world countries. On the other hand, for the correlation analyses of migration variables with cross-national interaction variables, cross-national inequality variables, and unemployment and population variables, migration variables consist of professional migration, nonprofessional migration and total migration whose names and measurements are as follows:

**Professional Migration** is measured as the total number of professional specialty and technical with executive, administrative, and managerial categories of occupational groups based on the definitions of Immigration and Naturalization Service (2002) admitted to the U.S. from an origin country within a fiscal year.

**Nonprofessional Migration** is measured as the total sum of occupational categories of sales, administrative support, precision, production, craft and repair,

operator, fabricator, and laborer and farming, forestry, and fishing with service based on the classifications of Immigration and Naturalization Service (2002) admitted to the U.S. from an origin country within a fiscal year.

**Other Migration** is measured as the total number of immigrants to the U.S. from an origin country within a fiscal year including homemakers, students, unemployed or retired persons, and others not reporting or with an unknown occupation based on the definitions of Immigration and Naturalization Service (2002).

**Total Migration** is based on the total number of immigrations covering all categories of immigrants from an origin country to the U.S. within a fiscal year based on the classifications of Immigration and Naturalization Service (2002).

*Cross-national interaction variables* are based on economic interaction and educational articulation, which include five different variables whose names and measurements are as following:

**U.S. Export** is measured as the total amount of U.S export to a sending country in millions of dollars during 1990, and 2000 (U.S. Department of Commerce and International Trade Administration 1990, and 2000).

**U.S. Import** is based on total amount of U.S import from a sending country in millions of dollars in 1990, and 2000 (U.S. Department of Commerce and International Trade Commission 1990, and 2000).

**U.S. Investment** is measured as total amount of U.S. direct investment in a sending country in millions of dollars during 1990, and 2000 (U.S. Department of Commerce Bureau of economic Analysis in 1990, and 2000).

**Foreign Investment in the U.S.** is based on total amount of a foreign country's direct investment in the U.S. in millions of dollars during the 1990 and 2000 (U.S. Department of Commerce Bureau of economic Analysis 1990, and 2000).

**Number of Student in the U.S.** is measured based on the total number of foreign students in the colleges and universities of the U.S. from a sending country during the 1989-1990, and the 1999-2000 (Institute of International Education 1990, and 2000).

*Cross-national inequality variables* consist of five variables whose names and measurements are as follows:

**Difference in Life Expectancy** is measured based on the difference in life expectancy at birth between the U.S. and a sending country during 1990, and 2000 (World Bank, 1990, and 2000; Human Development Report 2001, 2001).

**Difference in per capita GNP** is measured as the difference in per capita gross national product between the U.S. and a sending country in dollars during 1990 and 2000 (World Bank 1990, and 2000; National Foreign Assessment Center 1990, and 2000; Human Development Report, 2001, 2001).

**Difference in the Gross Enrollment Ratio** is based on the difference in the general enrolment ratio of combining primary secondary and tertiary education between the U.S. and a sending country as percentage level during 1990, and 2000 (UNESCO Statistical Yearbook 1999, 1999; and Human Development Report 2001, 2001).

**Difference in Expenditure for Research and Development** is measured as the difference between the U.S. and a specific country in expenditure for research and development as the percentage of gross national product during 1990, and 2000 (UNESCO Statistical Yearbook 1999, 1999; Human Development Report 2001, 2001).

**Difference in Professional Unemployment Ratio** is measured as the difference between a specific foreign nation and the U.S. in the ratio of total number of professional unemployment to the total number of occupational unemployment during 1990 and 2000 (calculated from International Labor Office, various years for 1990, and 2000). Such as during 2000  $D_{\text{profUnempR}} = (\text{ProfUnemp}/\text{TotOccupUnemp}) - .145$ .

*Unemployment and population group* includes four variables that each one is a kind of control variables whose names and measurements are as follows:

**Professional Unemployment** is measured based on total unemployment number of professional, technical, administrative and managerial workers by occupational category based on International Standard Classification of Occupations ISCO-1968-012 and ISCO-88-123 for a specific country within a specific year.

**Total Occupational Unemployment** is measured as the total sum of unemployment number of occupational categories based on International Standard Classification of Occupations ISCO-1968- from 0 through 9 and ISCO-88- from 0 through 9 for a specific country within a specific year.

**Total Unemployment** is based on the total number of unemployment of a specific country during a specific year.

**Total Population** is midyear total population of a specific country during a specific year.

## Method

After a descriptive analysis of existing data based on a univariate and a bivariate statistical analyses, the study uses correlation coefficient to measure the associations between the migration variables and macro level structural variables of immigrant

sending countries to the U.S. Migration variables include professional migration, nonprofessional migration and other migration variables for bivariate analyses based on the percentage distribution of migration variables among different groups of five categories of all the world countries in 1990 and 2000. On the other hand, for the correlation coefficient analyses of migration variables with cross-national interaction, cross-national inequality, and unemployment and population variables, migration variables consist of professional migration, nonprofessional migration and total migration. In this case, total migration variable exchanged with other migration variable. The reason for this change is that other migration category includes a large number of immigrants whose occupations are unknown, so that it is more likely to include some of professional immigrants who did not report their occupations. In order to avoid from this issue, the research deals with total migration instead of other migration category.

Macro level structural variables consist of three different groups. The first two main groups are cross-national interaction variables and cross-national inequality variables, and the last one is a control group as unemployment and population variables.

For univariate descriptive analyses, all the world countries were classified based on five categories as regional, human development index, per capita gross national income level, development level, and regional and industrial aggregates. After that, these five categories were subdivided into several groups and tabulated to represent their frequency and percentage distributions during 1990 and 2000. For bivariate analyses, like univariate analyses, all the world countries were classified into five different categories and these five categories were subdivided into several groups to show the percentage distributions of migration components as professional migration, nonprofessional

migration and other migration across different groups of five categories of all the world nations in 1990 and 2000.

In order to examine the relationships of migration variables based on professional migration, nonprofessional migration and total migration with cross-national interaction, cross-national inequality, and unemployment and population variables, the research uses correlation coefficients methods.

Primarily the research first investigates the relationships between the size of professional migration and cross-national interaction variables based on four economic interaction and one educational articulation variables. Economic interaction variables are U.S. export, U.S. import, U.S. foreign investment, and foreign investment in the U.S. And educational articulation variable is the student number of an immigrant sending country in the U.S higher education institutions. Second the research tests the connections between the size of professional migration and five cross-national inequality variables, which are difference in life expectancy, difference in per capita gross national income, difference in gross enrollment ratio, difference in expenditure for research and development, and difference in professional unemployment ratio between the U.S. and an immigrant sending country.

Secondarily the study first examines the relationships of the volume of professional migration with unemployment and population variables based on professional unemployment, total occupational unemployment, total unemployment and total population of an immigrant sending country. Consequently, the research also investigates the associations of nonprofessional migration and total migration variables with fourteen variables of other three groups based on cross-national interaction, cross-



national inequality and unemployment and population variables to compare with the primary level analysis of this research.

In order to show the patterns and trends of relationships between the size of professional immigration from sending countries to the U.S. and the structural factors of those immigrant-sending countries over the ten years between 1990 and 2000, the study employs a longitudinal design covering two consecutive points in time of 1990, and 2000. The reason for using a longitudinal study is to give the researcher more advantages for stronger inferences about the changes in the level and direction of associations between the size of brain drain from all world countries to the United States and the variables of cross-national interaction and cross-national imbalances between all those countries and the U.S.

A total of 221 countries were included in this analysis for each of the two time periods of 1990 and 2000 (see Appendix A for the list of all the world countries that are used in this research). Although the unit of analysis is the nation state, these 221 countries were grouped into five different categories including several sub groups and then described based on their univariate and bivariate analyses. These five categories are based on geographical region, human development index (HDI), income aggregates as the per capita gross national product (GNP), developmental level, and regional and industrial aggregates. The descriptions and the sources of data for five categorizations of all the world countries are based on several sources.

**Region** refers to the classification of a country regarding its geographical location based on six main continents as 1 Europe, 2 Asia, 3 Africa, 4 Oceania, 5 North America, and 6 South. America (see Appendix B for the classification of all world countries based on regional category). Data for regional categorization of all the world countries during

1990 and 2000 were updated from 2000 Statistical Yearbook of Immigration and Naturalization Service (INS), 2002, and from United Nations Population Division World Population Prospects: the 2002 Revision Population Database and Definition of Regions on the world wide web at <http://esa.un.org/unpp/definition.html> (February, 2003).

**HDI** means human development index, consisting of  $\frac{1}{3}$  (life expectancy index) +  $\frac{1}{3}$  (education index) +  $\frac{1}{3}$  (gross domestic product (GDP) index) for a specific country, which is used for the classifications of all world countries . Such as 1 low human development refers to below .500 HDI, 2 medium human development indicates between .500 and .799 HDI, and 3 high human development refers to .800 and above HDI. Data for the categorization of all the world countries based on human development level in 1990 were from Human Development Report 1991 of United Nations Development Programme (UNDP), 1991, Human Development Report 1992 of UNDP, 1992, and Human Development Report 1993 of UNDP, 1993. Data for categorization of all the world countries based on human development level during 2000 came from Human Development Report 2002 of UNDP, 2002 (see Appendix C for the classifications of all world countries based on human development index group).

**Income Aggregate** refers to the classifications of all world countries based on per capita gross national product (GNP). Such as low income group refers to less than \$500 per capita GNP, medium income group indicates between \$500 and 5999 GNP per capita, and high income countries group is \$6,000 and above GNP per capita in 1990. Data for the categorization of all the world countries based on per capita gross national product in 1990 were from Human Development Report 1991 of United Nations Development Programme (UNDP), 1991, Human Development Report 1992 of UNDP, 1992, and Human Development Report 1993 of UNDP, 1993. The classifications of all world

countries for per capita gross national product (GNP) in 2000 are based on following measurement. Low income group refers to less than \$755 per capita GNP, medium income group is between \$756 and 9,265 GNP per capita, and high income countries group is \$9266 and above GNP per capita. Data for categorization of all the world countries based on per capita gross national product in 2000 came from Human Development Report 2002 of UNDP, 2002 (see Appendix D for the classifications of all world countries based on income aggregate).

**Development Level** refers to the development levels of all the world countries based on world aggregates as 1 least developed countries, 2 developing countries, 3 industrial countries, and 4 Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries. Data for the categorization of all the world countries based on development level in 1990 were updated from Human Development Report 1991 of United Nations Development Programme (UNDP), 1991, Human Development Report 1992 of UNDP, 1992, and Human Development Report 1993 of UNDP, 1993. Data for categorization of all the world countries based on development level in 2000 were updated from Human Development Report 2002 of UNDP, 2002 (see Appendix E for the classification of all the world countries based on development level).

**Regional and Industrial Aggregate** indicates the classification of all the world countries based on regional and industrial aggregates such as 1 Sub-Saharan Africa, 2 Arab States, 3 Latin America and Caribbean, 4 Asia and Pacific, 5 Organization for Economic Cooperation and Development (OECD) countries, 6 Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries, and 7 Other. Data for the categorization of all the world countries based on regional and industrial aggregates in 1990 were adopted from Human Development Report 1991 of United Nations

Development Programme (UNDP), 1991, Human Development Report 1992 of UNDP, 1992, and Human Development Report 1993 of UNDP, 1993. Data for categorization of all the world countries based on regional and industrial aggregates in 2000 were adopted from Human Development Report 2002 of UNDP, 2002 (see Appendix F for the classification of all the world countries based on regional and industrial aggregates).

In order to analyze the data based on correlation coefficient, SAS program was used. Actually it was possible to use other kinds of programs to measure the associations among the migration variables and structural variables, but the SAS program seemed to be more effective for this research, in organizing the data, creating new variables and groups, and in giving more options to the researcher to analyze data in several ways.

After the descriptive analyses of data, without any classification, all the world countries were analyzed to show the general associations between migration variables and all structural variables in general, and the relationships between the size of professional migration and the variables of international interaction and international inequality variables in specific for two different years. All these processes were followed for the analyses of each specific group of five categories for all the world countries during 1990 and 2000. If there were less than ten observations or data were missing for a variable within a group, it was eliminated from the analysis and not reported on the correlation tables.

In order to show the correlations among the variables, I did not use correlation matrix because it is not necessary to show all the associations among the seventeen variables for the purpose of this research. By using with statement in the SAS program, I just analyzed the correlations of three migration variables with 14 other structural

variables from cross-national interaction, cross national inequality, and unemployment and population groups. So that the result of this analysis excluded unnecessary correlations among some variables, and focused more on the associations among the related variables for the purposes of this research.

## CHAPTER V

### ANALYSIS OF DATA

#### Descriptive Analyses of the Data

The characteristics of the world countries were described based on their bivariate and univariate analyses. Based on the univariate analyses from Table 2 through Table 6, the countries were grouped into five categories and each category was subdivided into several groups to show the frequency and percentage distributions of each group within a specific category in 1990 and 2000. Like for the univariate analyses, for the bivariate analyses from Table 7 through Table 11, the world countries were divided into five categories and each category was subdivided into several groups to represent the percentage distributions of migration categories such as professional migration, nonprofessional migration, and other migration across the different groups of five world categories in 1990 and 2000.

#### Descriptions of Univariate Analyses

Table 2 shows the frequency and percentage distributions of selected countries based on their regional locations in 1990 and 2000. During the years of 1990 and 2000, each region has the same frequency and percentage distributions. Among the six regions, Africa has the largest frequency distribution with 55 countries and makes up 24.89 percent of total countries during the both years. Europe has the second largest frequency

distribution with 53 countries and represents 23.98 percent of all world countries in both years. This is due to the fact that these two regions are composed of smaller and a higher number of countries. Asia is the third largest continent having 43 countries that makes up 19.46 percent of all the world countries in 1990 and 2000. North America has

Table 2: Frequency and Percentage Distributions of Selected Countries by Region and Years

Region	1990		2000	
	Frequency	Percentage	Frequency	Percentage
1. Europe	53	23.98	53	23.98
2. Asia	43	19.46	43	19.46
3. Africa	55	24.89	55	24.89
4. Oceania	20	9.05	20	9.05
5. N. America	36	16.29	36	16.29
6. S. America	14	6.33	14	6.33
Total	221	100	221	100

36 countries that equal 16.29 percent of all the world countries. Later, Oceania has 20 countries that represent 9.05 percent of total 221 countries. South America has the smallest frequency and percentage distributions among all six continents having 14 countries and representing 6.33 percent of all world countries during both the years of 1990 and 2000.

Table 3 represents the frequency and percentage distributions of all countries based on human development index (HDI) as low HDI, medium HDI and high HDI countries during 1990 and 2000. However, 32 countries in 1990 and 6 countries in 2000 were missing due to the lack of data about them. During 1990 high human development index group has the highest frequency distributions with 75 countries and highest percentage distribution with 39.68 percent of all 189 countries. Low human development

index group has the second highest frequency and percentage distributions with 63 countries and 33.33 percent of the total countries in this research. Medium human development index countries seem to have the lowest frequency distribution with 51 countries and the lowest percentage distribution with 26.98 percent of total 189 countries during 1990. On the other hand, during 2000 the frequency and percentage distributions of all the world countries based on human development index are significantly different

Table 3: Frequency and Percentage Distributions of Selected Countries by Human Development Index (HDI) and Years

HDI	1990		2000	
	Frequency	Percentage	Frequency	Percentage
1. Low HDI	63	33.33	41	19.07
2. Medium HDI	51	26.98	112	52.09
3. High HDI	75	39.68	62	28.84
Total	189	100	215	100
	(Missing 32)		(Missing 6)	

from during 1990. In 2000, medium human development index group has the highest frequency with 112 countries and the highest percentage rate with 52.09 percent of total 215 countries. High human development index group has the second highest frequency and percentage the distributions. This group includes 62 countries that represent 28.84 percent of the total number of all the countries. However, low human development index group has the lowest frequency number with 41 countries and the lowest percentage rate of 19.07 percent of the total 215 countries in 2000. As a result, although the numbers of low human development index countries and high human development index countries decreased, the number of medium human development index countries extensively increased from 1990 to 2000.



Table 4 shows frequency and percentage distributions of selected countries based on their income aggregates and years. In this table the countries were divided into three groups based on their per capita gross national product (GNP) as low gross national

Table 4: Frequency and Percentage Distributions of Selected Countries by Income Aggregates Based on Gross National Product (GNP) and Years

Income Aggregates GNP	1990		2000	
	Frequency	Percentage	Frequency	Percentage
1. Low GNP	47	24.61	63	29.3
2. Medium GNP	102	53.4	107	49.77
3. High GNP	42	21.99	45	20.93
Total	191	100	215	100
	(Missing 30)		(Missing 6)	

product, medium gross national product and high gross national product in 1990 and 2000. However, in 1990 thirty countries and in 2000 six countries are missing due to the lack of data to classify them. During 1990, medium per capita gross national product group has the highest frequency distribution with 102 countries and the highest percentage distribution with 53.4 percent of total 191 countries.. However, high per capita gross national product group has the lowest level frequency and percentage distributions that includes 42 countries and represents 21.99 percent of total 191 countries in 1990. Like in 1990, in 2000 medium per capita gross national product group has the highest frequency level with 107 countries and the highest percentage distribution with 49.77 percent of total 215 countries. High per capita gross national product group has the lowest frequency level with 45 countries and the lowest percentage distribution making up 20.93 percent of total 215 countries. In sum, although the number of countries changed for each group, the order of three groups did not change from 1990 to 2000.

Table 5 illustrates frequency and percentage distributions of selected countries based on their developmental levels in 1990 and 2000. The countries are grouped into

Table 5: Frequency and Percentage Distributions of Selected Countries by Developmental Levels and Years

Developmental Level	1990		2000	
	Frequency	Percentage	Frequency	Percentage
1. Least Developed	45	23.68	49	22.58
2. Developing Countries	83	43.68	105	48.39
3. Industrial countries	32	16.84	33	15.21
4. Eastern Europe & Former U.S.S.R. Countries	30	15.79	30	13.82
Total	190	100	217	100
	(Missing 31)		(Missing 4)	

four categories as least developed, developing, industrial, and Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries for two different year periods. During 1990 thirty-one countries and during 2000 four countries are missing because the data were not available.

In 1990 the group of developing countries has the highest frequency distribution with 83 countries and the highest percentage distribution with 43.68 percent of the total 190 countries. The group of least developed countries seems to have the second highest frequency and percentage distributions that consist of 45 countries and make up 23.68 percent of all countries in this table. The group of industrial countries is the third largest group having 32 countries and representing 16.84 percent of total 190 countries. The Eastern Europe and former U.S.S.R. countries group is the smallest that includes 30 countries and makes up 15.79 percent of the 190 countries. Although in 2000 some groups had more countries than in 1990, the list of groups from the highest frequency and percentage distributions to the lowest was the same as in 1990. Developing countries

group has the largest frequency and percentage distributions that consists of 105 countries and makes up 48.39 percent of all 217 countries. The group of least developed countries is the second, industrial countries group is the third, and the group of Eastern Europe and former U.S.S.R. countries is the fourth to have the highest frequency and percentage distributions of all countries in 2000.

Table 6 shows the frequency and percentage distributions of selected countries based on regional and industrial aggregates during two time periods of 1990 and 2000. In this table all world countries were divided into 7 different groups in terms of their geographic locations and development levels as Sub-Saharan Africa, Arab States, Latin America and Caribbean, Asia and Pacific, Organization for Economic Cooperation and Development (OECD) countries, Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries, and other. During the years of 1990 and 2000 two countries are missing due to the lack of data.

Table 6: Frequency and Percentage Distributions of Selected Countries  
by Regional and Industrial Aggregates and Years

Regional and Industrial Aggregates	1990		2000	
	Frequency	Percentage	Frequency	Percentage
1. Sub-Saharan Africa	48	21.92	48	21.92
2. Arab States	17	7.76	18	8.22
3. Latin America & Caribbean	46	21	46	21
4. Asia & Pacific	44	20.09	44	20.09
5. OECD Countries	23	10.5	24	10.96
6. Eastern Europe & Former USSR Countries	30	13.7	30	13.7
7. Other	11	5.02	9	4.11
Total	219	100	219	100
	(Missing 2)		(Missing 2)	

In 1990 Sub-Saharan Africa has the largest frequency and percentage distributions that consist of 48 countries and represents 21.92 percent of a total of 219 countries. Latin America and Caribbean countries has the second, Asia and Pacific group has the third, Eastern Europe and former U.S.S.R. group has the fourth, the group of Organization for Economic Cooperation and Development (OECD) countries has the fifth, the group of Arab states has the sixth, and the group of other has the seventh highest frequency and percentage distributions of all the 209 countries

During 2000 the list of groups are the same as during 1990 but the total numbers of countries changed for three groups. Again Sub-Saharan Africa seems to have the highest frequency and percentage distributions with 48 countries and 21.92 percent of all 219 countries. The group of Latin America and Caribbean has the second, Asia and Pacific is the third, Eastern Europe and former U.S.S.R. group has the fourth, the group of Organization for Economic Cooperation and Development (OECD) countries has the fifth, Arab States group has the sixth, and the group of other has the seventh highest frequency and percentage distributions of total 219 countries in this study.

#### Descriptions of Bivariate Analyses

Tables 7 through Table 11 illustrate the raw numbers and percentage distributions of migration categories as professional migration, nonprofessional migration and other migration across the different groups of five categories among all the world countries during 1990 and 2000.

Table 7 illustrates the raw numbers and percentage distributions of migration categories as professional migration, nonprofessional migration, and other migration among the six regions of all the world countries, which are Europe, Asia, Africa,

Table 7: Migration Categories by Regions, Percentages and Years

Migration Categories	Regions					
	1. Europe	2. Asia	3. Africa	4. Oceania	5. North America	6. South America
<b>1990</b>						
Professional migration	18099 (16.1)	49393 (14.6)	6347 (17.7)	972 (15.7)	32537 (3.4)	6993 (8.1)
Nonprofessional migration	36629 (32.6)	81803 (24.2)	16303 (45.4)	2474 (40.0)	604006 (63.1)	40776 (47.5)
Other migration	57673 (51.3)	207385 (61.3)	13243 (36.9)	2736 (44.3)	321025 (33.5)	38050 (44.3)
Total migration	112401 (100.0)*	338581(100.0)*	35893 (100.0)	6182 (100.0)	957558 (100.0)	85819 (100.0)*
<b>2000</b>						
Professional migration	18503 (14.0)	39461 (14.9)	6177 (13.8)	842 (16.4)	10219 (3.0)	4206 (7.5)
Nonprofessional migration	19925 (15.0)	33761 (12.7)	7716 (17.2)	724 (14.1)	40388 (11.7)	7287 (13.0)
Other migration	94052 (71.0)	192178 (72.4)	30838 (68.9)	3570 (69.5)	294198 (85.3)	44581 (79.5)
Total migration	132480 (100.0)	265400 (100.0)	44731 (100.0)*	5136 (100.0)	344805 (100.0)	56074 (100.0)

Note: \* due to rounding error total percentage is not exactly 100.0.

Oceania, North America, and South America for the years of 1990 and 2000. In 1990 based on raw numbers Asia had the highest professional immigration number with 49,393 and Oceania had the lowest number with 972 professional immigrants. However, based on total migration, percentage distributions of professional migration across the six regions of the world countries Africa had the highest percentage distribution of professional migration with 17.7 percent, but North America had the lowest percentage of professional migration that makes 3.4 of its total migration to the U.S. The difference between the highest and the lowest percentages of professional migration is 14.3 percent.

Regarding raw numbers, while North America led all other regions with 604,006 nonprofessional immigrants and 321,025 other immigrants, Oceania had the lowest numbers of nonprofessional immigrant and other immigrant with 2,474 and 2,736 respectively. Based on percentage level of nonprofessional migration, North America had the highest percentage with 63.1 percent, but Asia had the lowest percent of this group that makes 24.2 percent of its total migration. For other migration category, while Asia seemed to have the highest percentage of other migration that makes up 61.3 percent of its total migration, North America had the lowest percentage of other migration category that represents 33.5 percent of its total migration during 1990.

In 2000, while Asia had the highest raw number of professional immigrants with 39,461, North America had the lowest number of this immigrant group with 10,219. However, based on the percentage distribution of professional migration, Oceania was the first region to have the highest percentage of professional. Like in 1990, in 2000 North America had the lowest percent of professional migration. In this sense, the largest difference in the percentage of professional migration is 13.4 percent between Oceania and North America.

For nonprofessional migration and other migration categories, North America had the highest raw numbers with 40,388 and 294,198 emigrants whereas Oceania had the lowest raw numbers of these nonprofessional and other migration categories with 724 and 3570 respectively. However, based on percentage distributions of nonprofessional migration among the six regions Africa had the highest percentage rate with 17.2 while North America had the lowest percentage of nonprofessional migration with 11.7 percent. Based on other migration category, North America seemed to have the highest percentage rate with 85.3 percent of its total migration, but Africa appeared to have the lowest percentage of other migration category with 68.9 percent of its total migration to the U.S.

Although based on raw numbers Asia had the largest number of professional migration, and North America had the highest numbers of nonprofessional migration and other migration categories, Oceania had the lowest numbers of all professional migration, nonprofessional migration and other migration categories in 1990 and 2000. Apart from Oceania there is a tendency to decrease the percentages of professional migration category from 1990 to 2000. Africa has the highest decrease in the percentage of professional migration from 17.7 percent in 1990 to 13.8 percent in 2000. On the other hand, Oceania is the only group whose percentage of professional migration increased from 15.7 in 1990 to 16.4 percent in 2000. While all the six regions have a decrease percentage in their nonprofessional categories from 1990 to 2000, they have an increase in the percentage levels of their other migration categories.

Table 8 represents raw numbers and percentage distributions of migration categories across the categories of human development index (HDI) during 1990 and 2000. Human development index consists of three different groups as low human

development index, medium human development index and high human development index.

Table 8: Migration Categories by Human Development Index, Percentages and Years

Migration Categories	Human Development Index (HDI)		
	1. Low HDI Countries	2. Medium HDI Countries	3. High HDI Countries
<b>1990</b>			
Professional migration	18802 (8.6)	42006 (10.3)	53290 (5.9)
Nonprofessional migration	84721 (38.5)	175726 (43.1)	520196 (57.4)
Other migration	116280 (52.9)	189772 (46.6)	332973 (36.7)
Total migration	219803 (100.0)	407504 (100.0)	906459 (100.0)
<b>2000</b>			
Professional migration	6072 (8.4)	50155 (8.0)	22881 (15.8)
Nonprofessional migration	10964 (15.2)	81077 (12.9)	17443 (12.1)
Other migration	55111 (76.4)	496380 (79.1)	104270 (72.1)
Total migration	72147 (100.0)	627612 (100.0)	144594 (100.0)

Note: \* due to rounding error total percentage is not exactly 100.0.

During 1990 while high human development index group had the highest raw numbers of professional immigration, nonprofessional migration and other migration categories, medium human development index group was the second, and low human development index group was the last to have the highest raw numbers of the three migration categories. On the other hand, medium human development index category had the highest percentage level of professional migration that makes up 10.3 percent of the total migration. Low human development index group seemed to have the second highest percentage of professional migration that represents 8.6 percent of total migration of this group. However, high human development index category had the lowest percentage of professional migration with 5.9 percent of total migration to the U.S. Consequently, the highest difference in percentage of professional migration occurred between medium human development group and high human development group with 4.4 percent.



For nonprofessional migration, while high human development group seemed to have the highest percentage with 57.4 percent of its total population, low human development group was the last with 38.5 percent. For other migration category, low human development group had the highest percent with 52.9 whereas high human development index category was the last to have the lowest percentage of that category, which represents 36.7 percent of its total migration to the U.S.

In contrast to 1990, in 2000 medium human development index group was the first, high human development index group was the second, and low human development index group was the third to have the highest raw numbers for each of the three migration categories. Based on the percentage distributions, although the group of high human development index had the highest percentage of professional migration that makes up 15.8 percent of its total migration, medium human development index category had the lowest percentage of professional migration that represents 8.0 percent of its total migration to the U.S. The highest percentage point difference in professional migration was between high human development group and medium human development group with 7.8 percent.

For nonprofessional migration category, low human development index group led other two groups with 15.2 percent of its total migration, but high human development index group had the lowest percentage level with 12.1 percent of its total migration. Based on other migration category, medium human development index group was the first with 79.1 percent of its total migration while high human development index group was the last with 72.1 percent of its total migration to the U.S.

Although the percentage levels of professional migration for the groups of low human development index and medium human development index decreased from 1990

to 2000, the percentage level of professional migration for the high human development group increased from 5.9 percent to 15.8 percent in the same time periods. On the other hand, for all three groups of human development index, while there was a significant decreasing pattern in the percentages of nonprofessional migration category, there was a stronger increasing tendency in the percentages of other migration category from 1990 to 2000.

Table 9 shows the raw numbers and percentage distributions of migration categories among the three groups of income aggregates of the world countries based on low income countries, medium income countries and high income countries in 1990 and 2000. During 1990 while medium income countries group had the highest raw number of professional migration with 68,176, low income countries group was the last with 20,801 professional immigrants. However, the group of high income countries had the highest percentage of professional migration category with 22.6 percent of its total migration and low income group had the second highest percentage of professional migration that makes up 10.1 percent of all total migration, but medium income group seemed to have the lowest percentage level of professional migration that represents only 5.6 percent of total migration to the U.S. In this matter, the highest percentage point difference in professional migration was 17.0 percent between high income group and medium income group. On the other hand, for the raw numbers of nonprofessional migration and other migration categories, medium income group was the first and high income group was the last to have the highest numbers of these two categories. For percentage distributions, medium income group had the highest percentage level of nonprofessional category with 56.2 percent and low income group was the second with 32.0 percent whereas high income group had the lowest percent of nonprofessional migration that makes 26.3

percent of its total migration. Based on other migration category, low income group appeared to have the highest percentage of this category with 58.9 percent, but medium

Table 9: Migration Categories by Income Aggregates, Percentages and Years

Migration Categories	Income Aggregates		
	1. Low Income Countries	2. Medium Income Countries	3. High Income Countries
<b>1990</b>			
Professional migration	20801 (10.1)	68136 (5.6)	25161 (22.6)
Nonprofessional migration	65949 (32.0)	685445 (56.2)	29249 (26.3)
Other migration	119179 (58.9)	465907 (38.2)	56944 (51.1)
Total migration	205929 (100.0)	1219488 (100.0)	111354 (100.0)
<b>2000</b>			
Professional migration	21665 (10.9)	39465 (7.2)	17978 (17.9)
Nonprofessional migration	31081 (15.7)	66974 (12.3)	11429 (11.4)
Other migration	145293 (73.4)	439280 (80.5)	71188 (70.8)
Total migration	198039 (100.0)	545719 (100.0)	100595 (100.0)*

Note: \* due to rounding error total percentage is not exactly 100.0.

income group seemed to have the lowest percentage of other migration that represents 38.2 percent of its total migration.

Although there is a pattern of increase for low income group and medium income group in the percentages of their professional migration from 1990 to 2000, high income group has a 4.7 percent decrease in the percentage of the professional migration during the same period. All the three low income, medium income and high income groups of income aggregates for all the world countries have a strong decreasing tendency in their percentages of their nonprofessional migration whereas they have a significant increasing pattern in the percentages of their other migration categories from 1990 to 2000.

Table 10 shows the raw numbers and percentage distributions of migration categories across different developmental levels of world countries based on least

developed, developing, industrial, and Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries in 1990 and 2000.

During 1990 developing countries group had the highest volumes of professional migration, nonprofessional migration and other migration among the four development level groups. Whereas least developed countries group had the lowest volume of professional migration category, Eastern Europe and former U.S.S.R. countries group had the lowest numbers of nonprofessional migration and other migration categories. On the other hand, although industrial countries group had the highest percentage of professional migration that is 22.6 percent of its total migration to the U.S., least developed countries group had the lowest percentage of professional migration with 6.1 percent among the four groups. In this matter, the highest percentage point difference between the group of industrial countries and the group of least developed countries is 16.5 percent.

During 2000, like during 1990, developing countries group led other three groups having the largest raw numbers of professional migration, nonprofessional migration and

Table 10. Migration Categories by Developmental Level, Percentages and Years

Migration Categories	Developmental Level			
	1. Least Developed Countries	2. Developing Countries	3. Industrial Countries	4. Eastern Europe & Former U.S.S.R.
<b>1990</b>				
Professional migration	3579 (6.1)	81282 (6.2)	22655 (22.6)	6498 (11.4)
Nonprofessional migration	19986 (34.0)	714213 (54.3)	27005 (26.9)	18960 (33.1)
Other migration	35233 (59.9)	520909 (39.6)	50769 (50.6)	31786 (55.5)
Total migration	58798 (100.0)	1316404 (100.0)*	100429 (100.0)*	57244 (100.0)
<b>2000</b>				
Professional migration	3071 (5.7)	50093 (8.0)	15934 (20.6)	10260 (10.9)
Nonprofessional migration	8924 (16.5)	78517 (12.6)	6544 (8.5)	15770 (16.7)
Other migration	41970 (77.8)	494342 (79.4)	54739 (70.9)	68192 (72.4)
Total migration	53965 (100.0)	622952 (100.0)	77217 (100.0)	94222 (100.0)

Note: \* due to rounding error total percentage is not exactly 100.0.

other migration categories. Although the least developed countries group had the lowest number of professional migration and other migration categories, industrial countries group had the lowest volume of nonprofessional migration category among the four groups. While the group of industrial countries again represented the highest percentage of professional migration with 20.6 percent of its total migration, the group of least developed countries had the lowest percentage of professional migration that only makes up 5.7 percent of its total migration to the U.S. Therefore, the highest difference in the percentage of professional migration between the groups of industrial countries and least developed countries is 14.9 percent.

In Table 10 from 1990 to 2000 apart from the least developed countries group there is a small decreasing tendency in the percentages of professional migration for the four development level groups. While the percentage distributions of nonprofessional migration show a strong decreasing pattern, the percentage distributions other migration category represent a significant increasing tendency among the four groups from 1990 toward 2000.

Table 11 displays the raw numbers and percentage distributions of three migration categories across the seven categories of regional and industrial aggregates based on Sub-Saharan Africa, Arab states, Latin America and Caribbean countries, Asia and Pacific countries, Organization for Economic Cooperation and Development (OECD) countries, Eastern Europe and former U.S.S.R. countries, and other during 1990 and 2000. In 1990 although Asia and Pacific countries group had the highest volume of professional migration with 44,944 people, other group had the lowest volume of professional

Table 11: Migration Categories by Regional & Industrial Aggregates, Percentages and Years

Migration Categories	Regional & Industrial Aggregates						
	1. Sub-Saharan Africa	2. Arab States	3. Latin America & Caribbean Countries	4. Asia & Pacific Countries	5. OECD Countries	6. Eastern Europe & Former U.S.S.R. Countries	7. Other
<b>1990</b>							
Professional migration	4903 (16.6)	3743 (15.2)	35211 (3.4)	44944 (14.5)	17608 (21.9)	6498 (11.4)	1424 (18.4)
Nonprofessional migration	14541 (49.3)	5804 (23.5)	640358 (62.4)	76728 (24.7)	23902 (29.8)	18960 (33.1)	1698 (21.9)
Other migration	10030 (34.0)	15129 (61.3)	350668 (34.2)	189069 (60.8)	38813 (48.3)	31786 (55.5)	4617 (59.7)
Total migration	29474 (100.0)*	24676 (100.0)	1026237 (100.0)	310741 (100.0)	80323 (100.0)	57244 (100.0)	7739 (100.0)
<b>2000</b>							
Professional migration	4339 (12.9)	3346 (10.9)	11144 (2.9)	36204 (15.4)	13100 (20.3)	10260 (10.9)	1015 (17.8)
Nonprofessional migration	5566 (16.5)	4530 (14.8)	46995 (12.2)	30604 (13.0)	5467 (8.5)	15770 (16.7)	569 (10.0)
Other migration	23791 (70.6)	22810 (74.3)	326423 (84.9)	168071 (71.5)	45996 (71.2)	68192 (72.4)	4134 (72.3)
Total migration	33696 (100.0)	30686 (100.0)	384562 (100.0)	235139 (100.0)*	64563 (100.0)	94222 (100.0)	5718 (100.0)*

Note: \* due to rounding error total percentage is not exactly 100.0.

migration category with 1,424 people. On the other hand, Latin America and Caribbean countries group led other six groups having the highest numbers of nonprofessional migration and other migration categories with 640,358 and 350,668 emigrants respectively, but other group had the lowest volumes of nonprofessional and other migration categories with 1,698 and 4617 people respectively. Based on percentage distributions of professional migration while OECD countries s group seemed to have the highest percentage point of professional migration, which represents 21 percent of its total migration and the group of other was the second with 18.4 percent, Eastern Europe and former U.S.S.R. countries group had the second lowest percentage of professional migration with 11.4 percent, and Latin America and Caribbean countries group had the lowest percent of professional migration, which is 3.4 percent of its total migration to the U.S. The highest difference in the percentages of professional migration takes place between OECD countries and Latin America and Caribbean Countries with 18.5 percent in 1990. For nonprofessional category, Latin America and Caribbean countries group seemed to have the highest percentage with 62.7 percent, but, the group of other appeared to have the lowest percentage of nonprofessional migration that only represents 21 percent of its total migration. For the other migration category, the Arab states group leads all other six groups having 61.3 percent of its total migration while Sub-Saharan Africa had the lowest percentage point of other migration category that only represents 34.0 percent of its total migration to the U.S.

During 2000 the distributions of raw numbers of three migration categories across the seven groups are similar to the distributions of those during 1990. While Asia and Pacific countries group led the other six groups having the highest number of professional migration with 36,204, Latin America and Caribbean group led the other six

groups having the highest volumes of nonprofessional migration and other migration categories with 46,995 and 326,423 people respectively. However, the other group had the lowest numbers of professional migration, nonprofessional migration and other migration categories with 1,015, 569, and 4,134 individuals respectively. For the percentage distribution of three migration categories among the seven groups of regional and industrial aggregates, the group of OECD countries had the highest percentage level of professional migration with 20.3 percent of its total migration, and the group of other had the second highest percent of professional migration that represents 17.8 percent of its total migration. However, the Latin America and Caribbean countries group appeared to have the lowest level of professional migration that represents only 2.9 percent of its total migration to the U.S. In this sense, the highest difference in the percentage distributions of professional migration occurs between the groups of OECD countries, and Latin America and Caribbean countries as 17.4 percent in 2000. For nonprofessional category, the Eastern Europe and former U.S.S.R countries group led all the six groups with 16.7 percent of its total migration whereas the group of OECD countries appeared to have the lowest percent of nonprofessional migration, which only represents 8.5 percent of its total migration. For other migration category, although Latin America and Caribbean group had the highest percentage level with 84.9 percent of its total migration, Sub-Saharan Africa had the lowest percent of other migration category, which represents 70.6 percent of its total migration to the U.S.

According to Table 11 there is a decreasing tendency in the percentage levels of professional migration for all six groups except the group of Asia and Pacific countries from 1990 to 2000. Like professional migration category, nonprofessional migration category has a decreasing pattern in its percentage points for all seven groups but its



magnitudes are much stronger than that of professional migration during the same period. On the other hand, other migration category has a strong increasing tendency in its percentage levels for all the seven groups from 1990 to 2000.

As a result, based on bivariate analyses Table 7 through Table 11 show common patterns and tendencies of three migration categories for all the world countries.

Although there is usually a small decreasing pattern in the percentages of professional migration and a stronger decreasing pattern in the percentages of nonprofessional migration, there is generally a strong increasing pattern in the percentages of other migration category for all different groups of the world countries from 1990 to 2000.

#### Descriptive Analyses of Tables for Means and Standard Deviations of All Variables

Before investigating the relationships between migration variables and structural variables of the world countries based on correlation coefficient, I examined the values of all these variables in order to understand their levels and variations. Table 12 through Table 35 represent observation numbers, means, and standard deviations of all variables for all the world countries in general and for the five categories of all the world countries in specific.

Table 12 illustrates the observation numbers, means, and standard deviations of seventeen variables based on cross-national interaction, cross-national inequality, unemployment and population, and migration categories. For cross-national interaction variables in 1990, there is no missing value for the 220 countries. On average, the U.S exported \$1,803 million of goods and services to each country yearly while importing an average of \$2,261 million from each country and also varied largely across the countries with standard deviations of 7,294 and 9,457 respectively. The U.S. direct investment

abroad averaged \$1,820 million per country and the average foreign investment in the U.S. for each country annually was \$1,850 million but variations were very large among all the countries. The mean number of foreign students in U.S. colleges and universities

Table 12: All World Countries  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	220	1803.00	7294.00	218	3630.00	15667.00
U.S. Import	220	2261.00	9457.00	218	5588.00	22567.00
U.S. Investment	220	1820.00	7824.00	219	5755.00	22112.00
Foreign Investment in the U.S.	220	1857.00	10218.00	219	5465.00	25658.00
Number of Student in the U.S.	220	1584.00	4239.00	219	2338.00	6865.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	189	11.25	9.92	189	11.33	11.63
Difference in Per Capita Gross National Income	191	17387.00	6411.00	200	28342.00	8551.00
Difference in Gross Enrollment Ratio	158	30.42	18.60	176	30.13	21.18
Difference in Expenditure for Research & Development	89	1.92	0.75	74	1.69	0.91
Difference in Professional Unemployment Ratio	59	-0.03	0.08	65	-0.04	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	59	62237.00	248731.00	66	142300.00	504668.00
Total Occupational Unemployment	68	1006572.00	4210080.00	68	1316950.00	5106910.00
Total Unemployment	117	728507.00	3254855.00	116	1096551.00	4054308.00
Total Population	216	24195.00	100365.00	214	26955.00	113610.00
<u>Migration</u>						
Professional Migration	220	519.53	1591.00	220	360.92	1067.00
Nonprofessional Migration	220	3558.00	31031.00	220	499.08	1335.00
Total Migration	220	6927.00	46575.00	220	3857.00	13357.00

for each country was 1,584 and also varied largely across the countries with a standard deviation of 4,239.

During 2000, the means of economic interaction variables were very high with very large standard deviations. Such as the mean of U.S. export to each country was \$3,630 million with a standard deviation of 15,667, and the average of U.S. import from each country was \$5,588 million with a standard deviation of 22,567. The other two economic interaction variables and student number in the U.S. have the same pattern, having higher means and standard deviations. Thus, the means and standard deviations of cross-national interaction variables were enormously higher in 2000 than in 1990 showing substantial variations across all the world countries.

For cross-national inequality variables, the observations numbers were significantly less than the former group variables for both years. The means and standard deviations of difference in life expectancy, difference in per capita gross national income, and difference in gross enrollment ratio between the U.S. and all the world countries seemed significant across all the world countries in 1990 and 2000. While the average of difference in professional unemployment ratio was low, its standard deviations were extremely high across the world countries. However, except for the means of difference in per capita gross national income variable, all the other variables did not show any important change in their means and standard deviations between 1990 and 2000.

For unemployment and population variables based on professional unemployment, total occupational unemployment, total unemployment, and total population, their standard deviations were significantly higher than their means during 1990 and 2000. That means across all world countries the variations in their professional

unemployment, total occupational unemployment, total unemployment, and total populations were very large.

For migration variables Table 12 indicates that professional migration averaged 519.53 individuals in 1990 and 360.92 individuals in 2000 per country annually and varied largely across the countries with a (SD) of 1,591 in 1990 and 1,067 in 2000. Like professional migration, nonprofessional migration and total migration variables illustrated the same patterns of means and standard deviations with much stronger scores. Although on average, each country sent 3,558 nonprofessional migration with a (SD) of 31,031 in 1990 and 499.08 nonprofessional migration with a (SD) of 1,335 in 2000, the average number of nonprofessional migration in 1990 is seven times higher than in 2000. This was probably the result of the Immigration and Reform Control Act (IRCA) of 1986 that gave an opportunity to 2.6 million former illegal aliens in the U.S. to gain permanent resident status during 1989-1992. On the other hand, the mean number of total immigrants admitted to the U.S. from the countries during 1990 was 6,927 per country with a (SD) of 46,575, and during 2000 was 3,857 per country with a (SD) of 13,357 annually. In this sense the cross-national variations in the size of total migration during these two time periods were enormous.

Table 13 displays the means and standard deviations of variables for European countries based on regional category during 1990 and 2000. Apart from difference in professional unemployment ratio, professional unemployment, and total occupational unemployment variables, observation numbers are not missing significantly for the other variables. The means of cross-national economic interaction variables changed between \$2,098 million to \$4,665 million in 1990 and \$3,718 million to \$16,064 million in 2000, standard deviations of these variables were very high among the European countries.

On the other hand, based on cross-national inequality variables, the mean difference in life expectancy in 1990 was 3.18 with a (SD) of 2.89, but in 2000 it was 2.97 with a (SD) of 4.47. The other four variables of this group had a similar pattern in

Table 13: Europe Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	53	2228.00	4920.00	52	3718.00	8509.00
U.S. Import	53	2098.00	5243.00	52	4883.00	11230.00
U.S. Investment	53	4033.00	11571.00	52	13034.00	38168.00
Foreign Investment in the U.S.	53	4665.00	16573.00	52	16064.00	43338.00
Number of Students in the U.S.	53	783.00	1500.00	52	1500.00	2209.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	48	3.18	2.89	48	2.97	4.47
Difference in Per Capita Gross National Income	42	12280.00	9390.00	50	22894.00	12116.00
Difference in Gross Enrollment Ratio	44	15.77	6.82	45	12.71	12.31
Difference In Expenditure for Research & Development	35	1.46	0.70	35	1.38	0.89
Difference in Professional Unemployment Ratio	23	-0.01	0.05	29	-0.02	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	23	46107.00	68426.00	29	152450.00	358920.00
Total Occupational Unemployment	29	785593.00	1052455.00	30	1004478.00	1846447.00
Total Unemployment	44	510407.00	923739.00	44	822961.00	1607385.00
Total Population	53	19217.00	37504.00	51	15704.00	26169.00
<u>Migration</u>						
Professional Migration	53	341.49	786.68	53	349.11	608.32
Nonprofessional Migration	53	691.11	1753.00	53	375.94	673.55
Total Migration	53	1894.00	4467.00	53	2500.00	4055.00

that while the levels of differences between European countries and the U.S difference in per capita gross national income, difference in gross enrollment ratio, difference in expenditure for research and development, and difference in professional unemployment ratio were decreased, the variations in these differences among European countries were increased from 1990 to 2000. For unemployment and population variables, standard deviations seemed significantly higher than the means. In this sense the cross-national variations in the size of professional unemployment, total occupational unemployment, total unemployment and total population were very large during 1990 and 2000. Based on migration variables, the average number of professional migration for each European country in 1990 was 341.49 with a (SD) of 789.68, and in 2000 it was 349.11 with a (SD) of 608. These standard deviations indicate tremendous variation across European countries in the size of professional migration during the two time periods.

Table 14 represents the means and standard deviations of variables for Asian countries based on regional category. The unemployment related variables seemed to have significantly less observations than other variables, but each of these variables has more than 10 observations so they were included in this analysis. Apart from the U.S. investment variable during 1990, the means of cross national interactions variables were significantly higher than the means of all the world countries for those variables. The standard deviations of these variables were significantly higher than means of those variables especially for student number in the U.S. These high standard deviations indicate large variations across Asian countries in the amount of U.S. export and import with Asian countries, U.S. investment in Asia, Asian countries investment in the U.S, and Asian students in U.S. colleges and universities. Except difference in professional unemployment ratio, the means of all the other four cross national inequality variables

were significantly large, but their standard deviations were not so high. Thus, Asian countries were not significantly different from each other in the scores of cross-national inequality variables during 1990 and 2000. On the other hand, the averages of,

Table 14. Asia Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	43	2864.00	7802.00	43	5179.00	11550.00
U.S. Import	43	4869.00	14245.00	43	11342.00	27377.00
U.S. Investment	43	1126.00	3589.00	43	4144.00	10482.00
Foreign Investment in the U.S.	43	2378.00	12760.00	43	4276.00	24911.00
Number of Students in the U.S.	43	5146.00	8158.00	43	7276.00	13703.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	39	11.26	8.77	39	9.10	8.28
Difference in Per Capita Gross National Income	39	17059.00	6088.00	40	28126.00	8695.00
Difference in Gross Enrollment Ratio	36	31.64	14.83	38	31.39	13.92
Difference in Expenditure for Research & Development	19	2.08	0.81	15	1.58	1.15
Difference in Professional Unemployment Ratio	12	-0.04	0.07	15	-0.04	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	12	167845.00	545948.00	15	279344.00	939541.00
Total Occupational Unemployment	13	2916681.00	9536115.00	15	3356699.00	10549763.00
Total Unemployment	18	2780087.00	8010627.00	25	2796242.00	8218358.00
Total Population	40	77360.00	221046.00	40	89863.00	250884.00
<u>Migration</u>						
Professional Migration	43	1149.00	2380.00	43	917.70	2144.00
Nonprofessional Migration	43	1919.00	3726.00	43	785.14	1661.00
Total Migration	43	7868.00	13964.00	43	6172.00	11540.00

unemployment and population variables were very high with large standard deviations. In this case, there were large variations in the amount of professional unemployment, total occupational unemployment, total unemployment and total population across Asian countries during the both years. For migration variables, the mean number of professional immigrants admitted to the U.S. from Asian countries in 1990 was 1,149 per country and in 2000 it was 917.70 with higher standard deviations. Therefore among Asian countries the variation in the size of professional migration was enormous. The means and standard deviations of nonprofessional migration and total migration showed the same tendencies of professional migration during the same years.

Table 15 illustrates the observation numbers, means and standard deviations of variables for African countries based on regional category during 1990 and 2000. Since the observation numbers of variables as difference in expenditure for research and development in 2000, and difference in professional unemployment ratio, professional unemployment, and total unemployment in 1990 and 2000 have less than ten observations, these variables were eliminated from the correlation tables in this research.

During 1990 and 2000, the means of cross-national interaction variables were much less than the average of all the world countries, but their standard deviations were tremendous representing huge differences among African countries. Such as the average of foreign investment in the U.S. was \$8 million with a (SD) of 61.24 in 1990 and it was \$50.42 million with a (SD) of 263.36 in 2000 per African country.

On the other hand, for cross-national inequality variables, the means of differences in life expectancy, differences in per capita gross national income, differences in gross enrollment ratio, and differences in expenditure for research and development between the U.S. and African countries were much higher than the means of all world



countries, but the standard deviations of these variables were very small. Therefore, African countries were very similar to each other having the same level of cross-national inequality based on these variables for both years.

Table 15: Africa Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	55	144.70	398.03	55	198.72	613.84
U.S. Import	55	286.29	920.83	55	502.50	1619.00
U.S. Investment	55	55.18	210.31	55	236.47	651.52
Foreign Investment in the U.S.	55	8.00	61.24	55	50.42	263.36
Number of Students in the U.S.	55	402.18	698.21	55	551.75	990.55
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	54	22.55	7.25	53	25.62	9.47
Difference in Per Capita Gross National Income	53	20868.00	1222.00	53	33218.00	1513.00
Difference in Gross Enrollment Ratio	46	47.17	19.04	52	48.52	21.55
Difference in Expenditure for Research & Development	16	2.48	0.25	6	2.38	0.26
Difference in Professional Unemployment Ratio	5	-0.09	0.02	4	-0.09	0.07
<u>Unemployment and Population</u>						
Professional Unemployment	5	6249.00	12186.00	4	3732.00	5848.00
Total Occupational Unemployment	5	300527.00	584941.00	4	437082.00	840649.00
Total Unemployment	20	198780.00	384063.00	17	243581.00	477155.00
Total Population	55	11252.00	15962.00	55	14416.00	20688.00
<u>Migration</u>						
Professional Migration	55	115.40	279.39	55	112.31	262.34
Nonprofessional Migration	55	296.42	845.94	55	140.29	282.46
Total Migration	55	652.42	1527.00	55	813.29	1518.00

The average of total unemployment was 198,780 with a (SD) of 384,063 in 1990, and 243,581 with a (SD) of 477,155 in 2000. The mean of total population was 11,252 with a (SD) of 15,962 in 1990 and 14,416 with a (SD) of 20,688 in 2000. Thus, while the means and standard deviations of these variables were significantly lower than the averages of the world countries, the variations in these variables were still important across the African countries. The averages and standard deviations of migration variables were also tremendously lower than the averages of the world countries during the two years. The average numbers of professional migration from African countries to the U.S. were 115.4 with a (SD) of 279 in 1990, and 112.31 with a (SD) of 262.34 in 2000 per country. The means and standard deviations of other two nonprofessional and total migration variables have a similar pattern with professional migration. That means, the averages and standard deviations of professional, nonprofessional and total migration variables were tremendously lower than that of world countries, but there were still significant variations across African countries in the volume of migration numbers during 1990 and 2000.

Table 16 displays the observation numbers, means and standard deviations of variables for Oceania countries based on regional category. For this group the observation numbers of cross-national inequality, and unemployment and population variables were less than ten except for two variables in 1990 and 2000. Therefore, these variables were not used in the correlation analysis for this study. Although the means of cross-national interaction variables were tremendously smaller than the averages of world countries, the standard deviations of these variables were enormous during the two years. This indicates that the variations in U.S. export and import, in U.S. investment abroad, in foreign investment in U.S., and in the number of students from these countries in U.S

were very large across Ocean countries. Difference in per capita gross national income averaged \$17,505 with a (SD) of 5,167 in 1990 and \$27,983 with a (SD) of 6,712 in 2000 between the U.S and per country of Oceania. These standard deviations indicated a lower

Table 16: Oceania Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	20	500.56	1908.00	20	740.41	2798.00
U.S. Import	20	288.31	1014.00	20	441.19	1485.00
U.S. Investment	20	758.46	3378.00	20	1962.00	7909.00
Foreign Investment in the U.S.	20	336.80	1461.00	20	1054.00	4625.00
Number of Students in the U.S.	20	180.85	392.85	20	233.45	600.40
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	9	7.57	6.28	9	6.61	6.52
Difference in Per Capita Gross National Income	14	17505.00	5167.00	16	27983.00	6712.00
Difference in Gross Enrollment Ratio	6	24.67	19.15	7	25.14	30.55
Difference in Expenditure for Research & Development	2	1.53	0.24	2	1.38	0.28
Difference in Professional Unemployment Ratio	2	-0.02	0.06	1	0.01	.
<u>Unemployment and Population</u>						
Professional Unemployment	2	23800.00	2687.00	2	33900.00	22910.00
Total Occupational Unemployment	2	376100.00	294864.00	1	113400.00	.
Total Unemployment	5	154183.00	250126.00	3	42225.00	61703.00
Total Population	19	1378.00	3911.00	19	1597.00	4449.00
<u>Migration</u>						
Professional Migration	20	48.60	124.17	20	42.10	117.62
Nonprofessional Migration	20	123.70	240.24	20	36.20	88.80
Total Migration	20	309.10	564.56	20	256.80	572.83

variation across Oceania countries for this variable. The mean number of total population was 1,378,000 with a (SD) 3,911,000 in 1990 and 1,597,000 with a (SD) of 4,449,000 in 2000 indicating tremendous variations across the countries of Oceania. The average number of professional migration admitted to the U.S. from these countries was 48.60 with a (SD) of 124.17 in 1990 and 42.1 with a (SD) of 117.62 in 2000. The means and standard deviations of other nonprofessional migration and total migration variables had the same tendencies of professional migration. Consequently, standard deviations showed that the variations in professional migration, nonprofessional migration, and total migration to the U.S. were enormous across Oceania countries during 1990 and 2000.

Table 17 represents the observation numbers, the means, and standard deviations of variables for North American countries based on regional category. Apart from foreign investment in the U.S., and number of students in the U.S. variables, the means of cross-national interaction variables of North American countries were significantly higher than those averages of all world countries in 1990. The averages of all cross-national interaction variables were tremendously higher than the averages of the world countries in 2000. However, the higher standard deviations of all interaction variables for both years indicated large variations across North American countries.

For cross-national inequality variables, while the mean for difference in life expectancy was smaller than that of all the world nations, the means for differences in professional unemployment ratio were tremendously higher than the averages of the world countries with high standard deviations for both years. These higher standards deviations illustrated the huge variations across North American countries in differences in life expectancy and professional unemployment ratio.

For unemployment and population variables, the means and standard deviations were lower than those of all world countries, but there were still significant variations among North American countries in the levels of unemployment and total population

Table 17: North America Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	35	3486.00	14737.00	34	9195.00	35501.00
U.S. Import	35	3690.00	16079.00	34	11449.00	45182.00
U.S. Investment	35	3184.00	12263.00	35	7662.00	24270.00
Foreign Investment in the U.S.	35	1445.00	5398.00	35	4331.00	19489.00
Number of Students in the U.S.	35	1225.00	2834.00	35	1563.00	4258.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	26	5.26	5.00	27	5.17	5.56
Difference in Per Capita Gross National Income	30	17707.00	4237.00	29	28113.00	5026.00
Difference in Gross Enrollment Ratio	15	27.00	12.92	22	27.14	9.75
Difference in Expenditure for Research & Development	8	2.18	0.71	7	2.18	0.60
Difference in Professional Unemployment Ratio	10	-0.05	0.04	10	-0.08	0.04
<u>Unemployment and Population</u>						
Professional Unemployment	10	25658.00	50229.00	10	27776.00	45330.00
Total Occupational Unemployment	11	288657.00	384461.00	11	265914.00	341649.00
Total Unemployment	19	179176.00	302513.00	16	195115.00	301634.00
Total Population	35	4947.00	14576.00	35	5827.00	17218.00
<u>Migration</u>						
Professional Migration	35	928.37	2653.00	35	291.80	618.78
Nonprofessional Migration	35	17257.00	77069.00	35	1154.00	2492.00
Total Migration	35	27355.00	114532.00	35	9851.00	29648.00

during 1990 and 2000. For migration variables, the mean of professional migration was 928.37 with a (SD) of 2,653 in 1990 and 291.80 with a (SD) of 618 in 2000. These standard deviations indicated tremendous variations among North American countries in the size of their professional migration in 1990 and 2000. During 1990, like professional variable, the averages of nonprofessional migration and total migration variables were significantly higher than 2000. In this sense, in 1990 and 2000 the variations in the sizes of nonprofessional migration and total migration were enormous across North American countries.

Table 18 illustrates the means and standard deviations of variables for South American countries based on regional category in the two different years. The averages and standard deviations of all cross-national interaction variables were significantly lower than the averages and standard deviations of all world countries. However, there were still important variations across South American countries in cross national interaction variables based on the amounts of U.S. export and import, U.S investment, foreign investment in the U.S. and the number of student in the U.S. from these countries. For cross-national inequality variables, the mean for difference in life expectancy was 8.56 with a (SD) of 4.9 in 1990 and it was 6.63 with a (SD) of 4.14 in 2000. These values were significantly lower than the averages of all the world nations and indicated less variation in the difference of life expectancy among South American countries during the two years. Although the differences in gross national income per capita averaged \$19,815 in 1990 and \$31,263 in 2000, which were higher than the average differences of all the world countries, the standard deviations were very small for both years. Consequently, the variations in the differences of per capita gross national income during the two years

Table 18: South America Based on Regional Category  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	14	1112.00	1452.00	14	2639.00	4114.00
U.S. Import	14	1865.00	3041.00	14	3633.00	5764.00
U.S. Investment	14	611.74	844.00	14	6001.00	10667.00
Foreign Investment in the U.S.	14	97.57	182.81	14	152.64	308.35
Number of Students in the U.S.	14	1220.00	1167.00	14	2238.00	2678.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	13	8.56	4.90	13	6.63	4.14
Difference in Per Capita Gross National Income	13	19815.00	1269.00	12	31263.00	2191.00
Difference in Gross Enrollment Ratio	11	22.73	8.17	12	20.08	6.68
Difference in Expenditure for Research & Development	9	2.26	0.42	9	2.35	0.22
Difference in Professional Unemployment Ratio	7	0.03	0.19	6	-0.06	0.04
<u>Unemployment and Population</u>						
Professional Unemployment	7	37419.00	34597.00	6	70018.00	67508.00
Total Occupational Unemployment	8	289726.00	252679.00	7	611566.00	508939.00
Total Unemployment	11	416816.00	686376.00	11	1244928.00	2207502.00
Total Population	14	21074.00	38379.00	14	24696.00	44193.00
<u>Migration</u>						
Professional Migration	14	499.50	444.31	14	300.43	306.54
Nonprofessional Migration	14	2913.00	4020.00	14	520.50	606.62
Total Migration	14	6130.00	7207.00	14	4005.00	4408.00

were not significant among South American countries. The average differences in gross enrollment ratio were 22.73 in 1990 and 20.08 in 2000 with lower standard deviations, which were significantly smaller than the averages of all the world countries. This

indicates that the variations across South American countries in differences in gross enrolment ratio were not significant.

On the other hand, the means and standard deviations of total unemployment and total population variables were significantly lower than those averages of the entire world countries, but still variations in the number of total unemployment and total population across South American countries were substantial in 1990 and 2000.

The means and standard deviations of professional migration, nonprofessional and total migration variables were smaller than those of all the world countries in both years. However, standard deviations of three migration variables were still significant indicating that the variations in the sizes of professional migration, nonprofessional migration and total migration were important across South American countries during 1990 and 2000.

Table 19 through Table 21 display the observations numbers, means, and standard deviations of variables for the countries of low human development, medium human development, and high human development groups based on human development index category during 1990 and 2000.

Table 19 illustrates the means and standard deviations of low human development countries. In this group, the observation numbers of some variables were less than ten observations so that they were not used in the correlation analyses. These variables are difference in expenditure for research and development, and total unemployment in 2000, and difference in professional unemployment ratio, professional unemployment, and total occupational unemployment in 1990 and 2000. The averages and standard deviations of cross-national interaction variables based on U.S. export, U.S. import, U.S. investment, and number of students in the U.S. were considerably lower than those of all the world countries, but these standard deviations still showed significant variations in the values of



all cross-national interaction variables across countries of low human development group during 1990 and 2000.

Table 19: Low Human Development Countries Based on Human Development Index  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	63	220.47	506.36	41	82.02	157.97
U.S. Import	63	367.35	996.98	41	502.51	1763.00
U.S. Investment	63	96.17	435.77	41	126.27	327.29
Foreign Investment in the U.S.	63	8.33	57.24	41	38.68	241.86
Number of Students in the U.S.	63	1083.00	3221.00	41	654.68	1233.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	63	22.79	6.70	39	28.14	6.32
Difference in Per Capita Gross National Income	62	21259.00	382.84	40	33844.00	575.00
Difference in Gross Enrollment Ratio	56	48.57	16.39	39	59.21	14.06
Difference in Expenditure for Research & Development	17	2.39	0.38	4	2.22	0.44
Difference in Professional Unemployment Ratio	7	-0.07	0.03	4	-0.09	0.07
<u>Unemployment and Population</u>						
Professional Unemployment	7	280762.00	714564.00	4	10919.00	13734.00
Total Occupational Unemployment	8	4651070.00	12124773.00	4	708826.00	1104307.00
Total Unemployment	21	2010293.00	7495970.00	9	600987.00	1107422.00
Total Population	63	31862.00	108777.00	41	21294.00	33951.00
<u>Migration</u>						
Professional Migration	63	298.44	802.82	41	148.10	370.69
Nonprofessional Migration	63	1356.00	3643.00	41	267.41	682.59
Total Migration	63	3489.00	8599.00	41	1760.00	4290.00

While the means of cross national inequality variables were extensively higher than those of all world countries, the standard deviations of these variables were extremely low. This indicates that the differences in the values of the cross-national inequality variables between the U.S. and low human development countries were tremendous whereas the variations in the differences of these variables were insignificant across the low human development countries in 1990 and 2000.

The average number of total unemployment was 2,010,293 with a standard deviation of 7,495,970. The mean for total population was 31,862 thousand with a standard deviation of 108,777 in 1990 and it was 21,294 thousand with a standard deviation of 33,951 in 2000. Therefore, among the countries of low human development group the variation in total unemployment in 1990 and the variations in total population in 1990 and 2000 were still large.

The number of professional migration averaged 298.44 with a (SD) of 802.82 in 1990 and 148.1 with a (SD) of 370.69 in 2000. The averages and standard deviations of nonprofessional migration and total migration to the U.S. from low human development countries followed the same patterns of nonprofessional migration. Thus, while the averages and standard deviations of these variables were significantly lower than the average values of all the world nations, the variations in the sizes of professional migration, nonprofessional migration, and total migration were still important across the countries of low human development group in 1990 and 2000.

Table 20 exhibits the observations number, means and standard deviations of variables for medium human development countries regarding human development index category. The observation numbers of all variables in 2000 were almost two times higher than the observations number of all variables in 1990. This is the result of trans.

Table 20: Medium Human Development Countries Based on Human Development Index  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	51	691.53	1230.00	111	2065.00	10808.00
U.S. Import	51	1160.00	2817.00	111	3825.00	16288.00
U.S. Investment	51	414.34	1353.00	112	1713.00	5950.00
Foreign Investment in the U.S.	51	135.63	633.74	112	173.78	902.74
Number of Students in the U.S.	51	1826.00	4368.00	112	2222.00	6791.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	51	8.83	3.85	94	10.52	8.25
Difference in Per Capita Gross National Income	51	19430.00	2933.00	100	31562.00	3274.00
Difference in Gross Enrollment Ratio	37	24.97	8.80	85	27.95	11.48
Difference in Expenditure for Research & Development	25	2.34	0.42	30	2.23	0.33
Difference in Professional Unemployment Ratio	13	-0.01	0.15	22	-0.04	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	13	24209.00	29515.00	22	315521.00	848484.00
Total Occupational Unemployment	14	324268.00	349116.00	24	2649269.00	8456740.00
Total Unemployment	28	505565.00	903369.00	56	1653797.00	5727114.00
Total Population	51	36347.00	161769.00	112	36607.00	154428.00
<u>Migration</u>						
Professional Migration	51	823.65	2047.00	112	447.81	1379.00
Nonprofessional Migration	51	3446.00	8761.00	112	723.90	1752.00
Total Migration	51	7985.00	16036.00	112	5604.00	18180.00

formations of some world countries from the low human development group and high human development group to medium human development group in 2000. The averages and standard deviations of all cross-national interaction variables for medium human

development group were much higher than those of low human development group. Thus, the average values of economic interaction and educational articulation variables were significantly large, and the variations in the values of these variables were substantial across the countries of medium human development group

Apart from the difference in professional unemployment ratio, the means of all cross-national inequality variables were extensively less than those of low human development group, and the scores of standard variations of these variables were significantly smaller than those of low human development category. This indicates that the variations in the values of cross-national inequality variables were less significant across medium human development countries than across low human development countries in both years.

On the other hand, professional unemployment averaged 24,209 with a (SD) of 29,515 in 1990 and 31,521 with a (SD) of 848,484 in 2000. The mean and standard deviation of total unemployment variable were similar to the tendency of professional unemployment. Thus, averages and standard deviation of professional unemployment and total occupational unemployment in 2000 were tremendously larger than in 1990 for medium human development countries. The mean of total population was 36,347 thousand with a (SD) of 161,719 in 1990 and 36,607 thousand with a (SD) of 154,428 in 2000. This means the variation in the size of total population were huge across the countries of medium human development countries surpassing not only the average and standard deviation of world countries but also the average and standard deviation of low human development countries.

On average, low human development countries sent 823.65 professional migration to the U.S. with a (SD) of 2,047 in 1990 and 447.81 with a (SD) of 1,379 in

2000. The mean and standard deviation of nonprofessional migration were similar to the pattern of professional migration for this group. However, the variations in the sizes of professional migration and nonprofessional migration were substantial across the countries of this group during 1990 and 2000. The average numbers of total migration were 7,985 with a (SD) of 16,036 in 1990 and 5,604 with a (SD) of 18,180 in 2000 showing that the variations in the size of total migration were tremendous among the medium human development countries in both years.

Table 21 represents observation numbers, means and standard deviations of variables for high human development countries based on human development index category. For this group, the averages and standard deviation of economic interaction and educational articulation variables were significantly higher than those of the other two human development groups in both years. In this sense the higher levels of standard deviations of these variables indicate that the variations in the values of cross-national interaction variables were extensive across high human development countries in 1990 and 2000. The means and standard deviations of cross national interaction variables were usually smaller than those of the other two human development groups in both years.

The variations in differences between high human development countries and the U.S. in the values of cross-national inequality variables were not usually important across the countries of high human development group. Although the averages of professional unemployment and total occupational unemployment variables for high human development group were significantly higher than those of medium human development group in 1990, the averages of total unemployment and total migration variables for high human development group were considerably lower than those of medium human development group in 1990 and 2000. However, the variations in the sizes of

unemployment and population variables were still important across the countries of high human development group in both years. The mean number of professional migration

Table 21: High Human Development Countries Based on Human Development Index  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	74	4675.00	12068.00	61	9159.00	25064.00
U.S. Import	74	5591.00	15643.00	61	12652.00	35734.00
U.S. Investment	74	5104.00	12860.00	61	17432.00	38953.00
Foreign Investment in the U.S.	74	5245.00	17121.00	61	19274.00	46062.00
Number of Students in the U.S.	74	2497.00	5468.00	61	3867.00	8953.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	66	2.57	2.67	56	0.97	3.02
Difference in Per Capita Gross National Income	62	11840.00	8303.00	59	19295.00	10446.00
Difference in Gross Enrollment Ratio	61	16.90	8.83	52	11.87	13.42
Difference in Expenditure For Research & Development	47	1.53	0.79	40	1.24	1.00
Difference in Professional Unemployment Ratio	37	-0.02	0.06	38	-0.04	0.05
<u>Unemployment and Population</u>						
Professional Unemployment	37	37266.00	60504.00	39	61686.00	106773.00
Total Occupational Unemployment	43	616363.00	911658.00	39	592836.00	926672.00
Total Unemployment	60	477468.00	817746.00	50	583372.00	931884.00
Total Population	73	18573.00	36046.00	60	13249.00	23397.00
<u>Migration</u>						
Professional Migration	74	719.68	1978.00	61	375.00	702.88
Nonprofessional Migration	74	7029.00	52945.00	61	285.89	565.46
Total Migration	74	12086.00	78806.00	61	2370.00	3927.00

was 719.8 with a (SD) of 1,978 in 1990 and 375 with a (SD) of 702 in 2000. While the average of nonprofessional migration for high human development group was 7,029 with a (SD) of 52,945 in 1990 that is larger than those of medium human development group, the mean and standard deviation of this variable for this group was lower than that of medium human development group in 2000. On the other hand, the mean and standard deviation of total migration of high human development group were extensively larger than those of medium human development group in both years. However, the variations in the volumes of professional migration, nonprofessional migration, and total migration were still substantial among the countries of high human development group in 1990 and 2000.

Table 22 through Table 24 show the observation numbers, means and standard deviations of all seventeen variables for the countries of low per capita gross national product (GNP), medium per capita gross national product and high per capita gross national product groups based on income aggregate categories during 1990 and 2000.

Table 22 demonstrates the observation numbers, means and standard deviations of variables for low per capita gross national product (GNP) countries in 1990 and 2000. This group had less than ten observations for difference in professional unemployment ratio, professional unemployment, and total occupational unemployment variables in 1990 and 2000 so that these variables were excluded from the correlation analyses due to the methodological issue in this research. For low per capita gross national product (GNP) countries, the means of economic interaction variables were considerably lower than those of all the world countries in both years, but the means of the number of student in the U.S. as educational articulation variable were higher than those of all world countries during both the years.

Table 22: Low Per Capita Gross National Product Countries Based on Income  
Aggregates Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	47	234.60	789.75	63	183.88	551.63
U.S. Import	47	590.49	2391.00	63	730.44	2290.00
U.S. Investment	47	23.57	105.74	63	280.84	1114.00
Foreign Investment in the U.S.	47	13.00	68.24	63	27.10	195.34
Number of Students in the U.S.	47	1755.00	5520.00	63	1549.00	5530.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	46	23.57	7.14	61	22.98	9.79
Difference in Per Capita Gross National Income	45	21416.00	235.25	62	33833.00	464.71
Difference in Gross Enrollment Ratio	40	52.93	14.15	61	49.33	17.99
Difference in Expenditure for Research & Development	14	2.36	0.30	11	2.16	0.42
Difference in Professional Unemployment Ratio	5	-0.08	0.02	9	-0.04	0.08
<u>Unemployment and Population</u>						
Professional Unemployment	5	386386.00	846776.00	9	483895.00	1211112.00
Total Occupational Unemployment	5	7147659.00	15369325.00	9	5236266.00	13581163.00
Total Unemployment	13	3208597.00	9500738.00	22	2580429.00	8778215.00
Total Population	47	59453.00	204721.00	63	38374.00	130028.00
<u>Migration</u>						
Professional Migration	47	442.57	1140.00	63	343.89	1325.00
Nonprofessional Migration	47	1403.00	3150.00	63	493.35	1238.00
Total Migration	47	4312.00	9748.00	63	3143.00	7607.00

On the other hand, the means of cross-national inequality variables for this group were significantly higher than the means of cross-national inequality variables of all the



world countries in both time periods. However, the standard deviations of cross-national inequality variables appeared less significant. This indicates that the variations in the differences between the U.S. and the countries of this group in life expectancy, in per capita gross national income, in gross enrollment ratio, and in expenditure for research and development were low across the countries of low per capita gross national product in 1990 and 2000.

The means and standard deviations of total unemployment and total population of this group were significantly large, which were similar to the pattern of all world countries. Thus, the variations in the sizes of total unemployment and total population were extensively high across the countries of low per capita gross national product group.

The average number of professional migration from these countries was 442.57 with a (SD) of 1,140 in 1990 and 343.89 with a (SD) of 1,325 in 2000. Although in 1990 the means and standard deviations of nonprofessional migration and total migration were significantly lower than those of world countries, in 2000 the means and standard deviations of nonprofessional and total migration were similar to the patterns of all the world countries. The variations in the volumes of professional migration, nonprofessional migration and total migration were still large across the countries of low per capita gross national product group in 1990 and 2000.

Table 23 represents the observation numbers, means and standard deviations of variables for medium per capita gross national product (GNP) countries in 1990 and 2000. Although difference in expenditure for research and development, difference in professional unemployment ratio, and professional unemployment variables had significantly less observation values than the other variables, the observation numbers were still more than ten observations for the correlation analysis.

The means of cross-national interaction variables of medium per capita (GNP) group were usually less than the averages of all the world countries, but they were higher than the averages of low per capita (GNP) group in both years. The standard deviations of

Table 23: Medium Per Capita Gross National Product Countries Based on Income Aggregates Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	102	938.44	3199.00	106	2492.00	11323.00
U.S. Import	102	1154.00	3732.00	106	4325.00	16980.00
U.S. Investment	102	436.47	1459.00	107	2073.00	6257.00
Foreign Investment in the U.S.	102	55.84	436.03	107	248.79	1019.00
Number of Students in the U.S.	102	1217.00	2679.00	107	2198.00	6807.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	101	9.56	6.72	89	8.38	7.68
Difference in Per Capita Gross National Income	94	19790.00	1307.00	95	30563.00	3329.00
Difference in Gross Enrollment Ratio	81	25.79	12.88	80	24.75	11.88
Difference in Expenditure for Research & Development	50	2.12	0.58	36	2.14	0.48
Difference in Professional Unemployment Ratio	29	-0.02	0.10	30	-0.05	0.04
<u>Unemployment and Population</u>						
Professional Unemployment	29	31499.00	43161.00	30	106599.00	331819.00
Total Occupational Unemployment	36	531377.00	752907.00	32	802212.00	1661608.00
Total Unemployment	63	403769.00	703346.00	58	851217.00	1753575.00
Total Population	102	18157.00	35819.00	107	25610.00	125002.00
<u>Migration</u>						
Professional Migration	102	668.00	2070.00	107	368.83	1038.00
Nonprofessional Migration	102	6727.00	45427.00	107	625.93	1614.00
Total Migration	102	11838.00	67850.00	107	5100.00	18037.00

cross-national interaction variables for medium per capita (GNP) group were still substantial indicating that variations in the values of cross national interaction variables were important across the countries of medium per capita (GNP) group in 1990 and 2000. The means of cross-national inequality variables of this group were higher than the means of low per capita (GNP) group apart from the mean of difference in professional unemployment ratio variable in 2000. The magnitudes of standard deviations of these variables were large enough to demonstrate that the variations in the values of cross-national inequality variables were important among the countries of medium per capita (GNP) group in 1990 and 2000.

On the other hand, the means and standard deviations of unemployment and population variables for this group were less than those of low per capita (GNP) countries. However, these standard deviations evidenced that the variations in the values of unemployment and population variables were still extensive across the countries of medium per capita (GNP) group in 1990 and 2000.

The averages of migration variables for medium per capita (GNP) group were higher than those of low per capita (GNP) group with strong standard deviations in both years. The means of professional migration for this group were 668 with a (SD) of 2,070 in 1990 and 368.83 with a (SD) of 1,038 in 2000. The means and standard deviations of nonprofessional and total migration had similar tendencies of professional migration. Thus, the variations in the volumes of professional migration, nonprofessional migration and total migration were huge across the countries of medium per capita (GNP) group during 1990 and 2000.

Table 24 shows the observation numbers, means and standard deviations of variables for high per capita gross national product (GNP) countries based on income

aggregates category during 1990 and 2000. Although the means of cross-national interactions variables of high per capita (GNP) countries were larger than those of the other two groups, the standard deviations of variables of this group were smaller than

Table 24: High Per Capita Gross National Product Countries Based on Income Aggregates Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	41	7035.00	15153.00	44	11716.00	28916.00
U.S. Import	41	8551.00	19932.00	44	16192.00	41251.00
U.S. Investment	41	8762.00	16379.00	44	23201.00	44581.00
Foreign Investment in the U.S.	41	9494.00	22215.00	44	26556.00	52587.00
Number of Students in the U.S.	41	3404.00	6300.00	44	4065.00	8720.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	34	0.99	2.84	39	-0.16	2.78
Difference in Per Capita Gross National Income	37	6489.00	7224.00	42	15412.00	9959.00
Difference in Gross Enrollment Ratio	34	15.68	10.46	35	8.94	14.77
Difference in Expenditure for Research & Development	25	1.27	0.83	27	0.91	0.97
Difference in Professional Unemployment Ratio	23	-0.01	0.06	25	-0.03	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	23	35369.00	64791.00	26	70688.00	124214.00
Total Occupational Unemployment	24	557668.00	900505.00	26	643892.00	1020183.00
Total Unemployment	33	541540.00	854348.00	35	601432.00	1016540.00
Total Population	40	14344.00	26163.00	43	14189.00	26090.00
<u>Migration</u>						
Professional Migration	41	612.85	1130.00	44	408.45	773.97
Nonprofessional Migration	41	712.78	1234.00	44	259.66	568.08
Total Migration	41	2713.00	4516.00	44	2285.00	3814.00

those of the other two groups. However, the variations in the values of cross-national interactions variables were still important across the countries of high per capita (GNP) countries in 1990 and 2000.

While the averages of cross national inequality variables for high per capita (GNP) countries were significantly less than those of other two groups, the standard deviations of cross-national inequality variables were considerably higher than those of other two groups indicating. great variations in the values of international inequality variables across the high per capita (GNP) countries in both years.

The average professional unemployment of this group was 35,369 with a (SD) of 64,791 in 1990 and 706,88 with a (SD) of 124,214 in 2000 that were lower than that of low and medium per capita (GNP) groups. The averages of total occupational unemployment and total unemployment for high per capita (GNP) group were higher than those of medium per capita (GNP) group in 1990, but these averages were smaller than those of low and medium per capita (GNP) groups in 2000. However, the means of total population of high per capita (GNP) group were smaller than those other two groups in 1990 and 2000. The standard deviations of these group variables were still important showing large variations in the values of unemployment and population variables across the countries of high per capita gross national product group.

Tables 25 through Table 28 represent the observations numbers, means and standard deviations of all variables for the four development level groups of all the world countries based on least developed countries, developing countries, industrial countries, and Eastern Europe and former U.S.S.R. countries in 1990 and 2000.

Table 25 illustrates the observation numbers, means and standard deviations of all variables for least developed countries in both years. The variables of difference in

expenditure for research and development, difference in professional unemployment ratio, professional unemployment, total occupational unemployment in 1990 and 2000, and total unemployment variable in 2000 had less than ten observations so that they were

Table 25: Least Developed Countries Based on Developmental Level  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	45	39.10	78.71	49	47.27	95.27
U.S. Import	45	51.15	115.55	49	188.06	612.34
U.S. Investment	45	8.24	35.52	49	66.73	246.82
Foreign Investment in the U.S.	45	10.18	67.52	49	31.49	221.31
Number of Students in the U.S.	45	280.13	456.50	49	358.39	667.31
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	44	23.81	7.36	47	25.47	8.67
Difference in Per Capita Gross National Income	43	21317.00	397.69	48	33754.00	594.90
Difference in Gross Enrollment Ratio	34	54.18	14.24	47	54.26	17.25
Difference in Expenditure for Research & Development	7	2.40	0.28	3	2.37	0.39
Difference in Professional Unemployment Ratio	2	-0.08	0.02	3	-0.07	0.08
<u>Unemployment and Population</u>						
Professional Unemployment	2	1447.00	967.32	3	4558.00	6340.00
Total Occupational Unemployment	2	43099.00	1569.00	3	167101.00	261626.00
Total Unemployment	8	158802.00	340189.00	11	243158.00	527190.00
Total Population	45	10627.00	18744.00	49	13625.00	22768.00
<u>Migration</u>						
Professional Migration	45	79.53	166.64	49	62.67	141.53
Nonprofessional Migration	45	460.24	1360.00	49	182.12	585.13
Total Migration	45	1307.00	3479.00	49	1101.00	3347.00

not used in the correlation analyses for this study. The means of cross-national interaction variables of least developed countries were significantly lower than those averages of all the world countries in both years. However, the variations in the values of U.S. export and import, U.S. investment, foreign investments in the U.S. and number of students in the U.S. variables were tremendous across the least developed countries in 1990 and 2000.

For this group, the means of cross-national inequality variables based on difference in life expectancy, difference in per capita gross national income, and difference in gross enrollment ratio were extensively larger than those of all the world countries. On the other hand, the magnitudes of standard deviations for these variables were extensively smaller than those of all the world countries. This indicates that the variations in the differences variables of life expectancy, per capita gross national income, and gross national enrollment ratio were not important across the countries of least developed countries group during both years. The means of total population were 10,627 million with a (SD) of 1,874 in 1990 and 13,625 million with a (SD) of 2,2768 in 2000 that were significantly less than the averages of all the world countries.

The means of professional migration were 79.53 with a (SD) of 166.44 in 1990 and 62.67 with a (SD) of 141.53 in 2000. These means and standard deviations were also substantially smaller than those of all the world countries, but the variations in the volume of professional migration were still extensively large across the least developed countries. Nonprofessional and total migration variables had the same tendencies of professional migration for the least developed countries in 1990 and 2000.

Table 26 exhibits, the observation numbers, means, and standard deviations of all the variables for developing countries based on development level category in 1990 and

2000. The variables of the difference in professional unemployment ratio, professional unemployment, and total unemployment had significant missing values, but they had more than ten observations and so were included in the correlation analyses in both years.

Table 26: Developing Countries Based on Developmental Level  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	83	1427.00	3661.00	104	2759.00	11475.00
U.S. Import	83	2046.00	4634.00	104	4762.00	17153.00
U.S. Investment	83	727.63	1788.00	105	2461.00	6755.00
Foreign Investment in the U.S.	83	307.36	1518.00	105	271.97	1001.00
Number of Students in the U.S.	83	2598.00	4927.00	105	2932.00	7932.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	83	10.59	7.30	87	9.27	8.92
Difference in Per Capita Gross National Income	83	18825.00	3767.00	93	29654.00	5152.00
Difference in Gross Enrollment Ratio	72	29.96	14.07	78	27.72	12.03
Difference in Expenditure for Research & Development	42	2.34	0.45	30	2.22	0.50
Difference in Professional Unemployment Ratio	28	-0.04	0.11	27	-0.06	0.05
<u>Unemployment and Population</u>						
Professional Unemployment	28	84793.00	356683.00	27	167666.00	701486.00
Total Occupational Unemployment	30	1443647.00	6278703.00	29	1869511.00	7614006.00
Total Unemployment	50	1157575.00	4889122.00	53	1577116.00	5788142.00
Total Population	83	42736.00	156601.00	105	39128.00	159496.00
<u>Migration</u>						
Professional Migration	83	979.30	2362.00	105	477.08	1423.00
Nonprofessional Migration	83	8605.00	50270.00	105	747.78	1798.00
Total Migration	83	15857.00	75089.00	105	5933.00	18723.00



Although the means of cross-national interaction variables for developing countries were extensively higher than the means for least developed countries in both years apart from the variable of student number in the U.S., the means of these variables were smaller than the averages of all the world countries. However, the standard deviations of these variables were considerably large showing that the variations in the values of cross national variables were still huge across the developing countries in both years.

The averages of cross-national inequality variables of developing countries were usually lower than those of least developed countries with smaller values of standard deviations. In this sense, apart from difference in life expectancy and difference in professional unemployment ratio, the variations in the values of cross-national inequality variables were not important among the developing countries in both years.

The means of unemployment and population variables were usually larger than the averages of all the world countries, and the magnitude of standard deviations indicated that there were still large variations across developing countries in the sizes of professional migration, nonprofessional migration, and total migration.

The averages of professional migration, nonprofessional migration and total migration for developing countries were extensively higher than those for least developed countries and those for all the world countries. The huge magnitudes of standard deviations for three migration variables showed that the variations in the sizes of professional migration, nonprofessional migration and migration variables were huge among the developing countries in both years.

Table 27 presents the observation numbers, means and standard deviations of all variables for industrial countries in 1990 and 2000. The averages of cross-national

interaction variables were extensively higher than those of all the world countries and those of the other two least developed and developing countries. While the magnitudes of standard deviations of industrial countries usually seemed to be lower than those of other

Table 27: Industrial Countries Based on Developmental Level  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	31	8612.00	17113.00	32	15491.00	33163.00
U.S. Import	31	10314.00	22585.00	32	21732.00	47333.00
U.S. Investment	31	11085.00	18256.00	32	30858.00	50147.00
Foreign Investment in the U.S.	31	11915.00	25072.00	32	36339.00	58936.00
Number of Students in the U.S.	31	3703.00	7058.00	32	5029.00	10017.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	24	-0.13	1.26	28	-1.15	1.83
Difference in Per Capita Gross National Income	27	5152.00	7733.00	30	12736.00	9583.00
Difference in Gross Enrollment Ratio	24	11.92	6.81	25	2.32	10.77
Difference in Expenditure for Research & Development	22	1.11	0.73	23	0.70	0.87
Difference in Professional Unemployment Ratio	18	-0.01	0.06	20	-0.02	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	18	45082.00	70524.00	21	85968.00	134163.00
Total Occupational Unemployment	19	710379.00	959654.00	21	782813.00	1093059.00
Total Unemployment	28	642740.00	892736.00	27	736349.00	1117411.00
Total Population	30	18433.00	29091.00	31	18707.00	29556.00
<u>Migration</u>						
Professional Migration	31	729.71	1231.00	32	497.75	871.42
Nonprofessional Migration	31	870.32	1356.00	32	204.38	304.24
Total Migration	31	3236.00	4882.00	32	2412.00	3975.00

wo groups of least developed and developing countries, the variations in the values of these variables were still important across the industrial countries in both years.

The averages of cross-national inequality variables for industrial countries were extensively lower than those of other two groups and those of all the world countries in both years. Consequently, the standard deviations of these variables were not significant indicating that the variations in the values of cross-national inequality variables were less important among the industrial countries in 1990 and 2000.

The means of professional unemployment, total occupational unemployment, total unemployment, and total population variables of industrial countries were smaller than those of developing countries and those of all the world countries with smaller standard deviations in both years. However, the variations in the values of unemployment and population variables were still substantial across the industrial countries.

The averages of professional migration for industrial countries were 729.71 with a (SD) of 1,231 in 1990 and 497.75 with a (SD) of 8,71.42 in 2000. Although these averages were lower than those of developing countries and those of all the world countries, the standard deviations of professional migration were less important than those of the other groups in both years. But these standard deviations indicated that there were still important variations among industrial countries in the sizes of professional migration admitted to the U.S. On the other hand, the averages and standard deviations of nonprofessional migration and total migration variables were similar to the patterns of professional migration in 1990 and 2000.

Table 28 shows the observation numbers, means, and standard deviations of all variables for Eastern Europe and former U.S.S.R. countries based on development level categories in 1990 and 2000. The averages of all cross-national interaction variables of

Eastern Europe and former U.S.S.R. countries were extensively lower than the averages of all the world countries. The averages of foreign investment in the U.S. and the student number in the U.S. variables were the lowest among the four development level groups in

Table 28: Eastern Europe and Former U.S.S.R. Countries Based on Developmental Level Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	30	266.10	662.23	29	218.06	410.88
U.S. Import	30	139.07	251.22	29	586.48	1467.00
U.S. Investment	30	16.33	68.79	29	386.59	895.43
Foreign Investment in the U.S.	30	8.13	31.45	29	132.34	638.20
Number of Students in the U.S.	30	100.27	252.02	29	871.10	1413.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	29	5.24	1.38	27	6.27	2.96
Difference in Per Capita Gross National Income	22	19430.00	764.29	28	31723.00	2481.00
Difference in Gross Enrollment Ratio	25	18.16	6.70	26	20.46	7.23
Difference in Expenditure for Research & Development	18	1.75	0.56	18	1.96	0.38
Difference in Professional Unemployment Ratio	9	0.00	0.04	14	-0.02	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	9	52256.00	65766.00	14	217493.00	493067.00
Total Occupational Unemployment	14	811364.00	1084159.00	14	1313013.00	2474594.00
Total Unemployment	23	342354.00	850587.00	24	876949.00	1943012.00
Total Population	30	21389.00	45714.00	28	14712.00	28045.00
<u>Migration</u>						
Professional Migration	30	216.60	638.25	30	342.00	509.55
Nonprofessional Migration	30	632.00	2036.00	30	525.67	828.98
Total Migration	30	1508.00	4880.00	30	3141.00	4633.00

1990. However, the variations in the values of cross-national interaction variables were still substantial across Eastern Europe and former U.S.S.R. countries in both years. The means of differences in life expectancy, in gross enrolment ratio, in expenditure for research and development for Eastern Europe and former U.S.S.R. countries were second lowest with smaller standard deviations among the four development level groups, and also they were smaller than those of all the world countries in both years. This shows that the variations in the differences variables of life expectancy, gross enrollment ratio, and expenditure for research and development were insignificant across the countries of Eastern Europe and former U.S.S.R. in both years.

The averages of total occupational unemployment and total population variables of this group were the second largest after the developing countries. The magnitudes of standard deviations evidenced that the variations in the values of unemployment and population variables were still substantial among the Eastern Europe and former U.S.S.R. countries in 1990 and 2000.

The means of professional migration of this group were 216.6 with a (SD) of 638.25 in 1990 and 342 and a (SD) of 509.55 in 2000 and were second lowest number of professional migration among all the four groups. The averages of nonprofessional migration and total migration of Eastern Europe and former U.S.S.R. countries were the second highest after the averages of developing countries in 2000. However, standard deviations of these variables indicated that the variations in the volumes of professional migration, nonprofessional migration, and total migration were large across the Eastern Europe and former U.S.S.R countries in both years.

Table 29 through Table 35 illustrate the observation numbers, means and standard deviations of all variables for seven groups of world countries based on regional and

industrial aggregates as Sub-Saharan Africa, Arab states, Latin America and Caribbean countries, Asian and Pacific countries, OECD countries, eastern Europe and former U.S.S.R. countries, and other countries during 1990 and 2000.

Table 29 displays the observation numbers, means and standard deviations of all variables for Sub-Saharan African countries in both years. The variables of difference in expenditure for research and development in 2000, differences in professional unemployment ratio, professional unemployment, and total occupational unemployment in 1990 and 2000 had less than ten observations so that they were eliminated from the correlation analyses in this research. The averages of cross-national interaction variables of Sub-Saharan African group were extensively less than the averages of all the world countries in both years. The values of standard deviations for these variables were usually lower than those of the world countries, but there were still great variations in the values of cross-national interaction variables across the countries of Sub-Saharan Africa in both years.

The means of cross-national inequality variables for Sub-Saharan Africa were extremely higher than the means of all the world countries, but the standard deviations of variables for this group were significantly small. Thus, the differences in cross-national inequality variables between the U.S. and the Sub-Saharan African countries were extensively large, but the variations in the values of these variables were not significant across the countries of Sub-Saharan Africa in both years.

The averages of total unemployment and total population variables for this group were extensively lower than for those of all the world countries. But the magnitudes of standard variations were still important showing that the variations in the sizes of total

unemployment and total population were important among Sub-Saharan Africa countries in both years.

Table 29: Sub-Saharan Africa Based on Regional and Industrial Aggregates  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	48	84.24	257.86	48	122.30	451.69
U.S. Import	48	261.60	921.90	48	489.34	1698.00
U.S. Investment	48	30.54	141.14	48	170.08	539.18
Foreign Investment in the U.S.	48	8.96	65.58	48	58.33	281.38
Number of Students in the U.S.	48	372.00	719.82	48	537.88	1022.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	47	23.61	6.93	46	27.47	7.95
Difference in Per Capita Gross National Income	47	21027.00	907.11	46	33360.00	1400.00
Difference in Gross Enrollment Ratio	40	49.28	18.45	45	50.67	20.42
Difference in Expenditure for Research & Development	13	2.46	0.28	4	2.38	0.32
Difference in Professional Unemployment Ratio	4	-0.09	0.02	3	-0.07	0.07
<u>Unemployment and Population</u>						
Professional Unemployment	4	811.00	929.48	3	809.00	229.18
Total Occupational Unemployment	4	39034.00	18691.00	3	16776.00	9596.00
Total Unemployment	15	43318.00	43154.00	13	59066.00	96701.00
Total Population	48	9911.00	15243.00	48	12883.00	20145.00
<u>Migration</u>						
Professional Migration	48	102.15	269.44	48	90.40	246.66
Nonprofessional Migration	48	302.94	894.97	48	115.96	261.81
Total Migration	48	613.83	1548.00	48	702.00	1465.00

The average numbers of professional immigrants admitted to the U.S. from Sub-Saharan African countries were 102.15 with a (SD) of 269.44 in 1990 and 90.4 with a (SD) of 246.66 in 2000. Although these averages were significantly smaller than those of all the world countries, the variations in the volumes of professional migration were still substantial among the countries of Sub-Saharan Africa in both years. The means and standard deviations of nonprofessional migration and total migration were similar to the tendencies of professional migration during 1990 and 2000.

Table 30 shows the observation numbers, means and standard deviations of variables for Arab states based on regional and industrial aggregates in 1990 and 2000. This group had significant problems with missing values for the variables of difference in expenditure for research and development, difference in professional unemployment ratio, professional unemployment, total occupational unemployment, and total unemployment in both years. The averages of cross-national interaction variables of Arab states were higher than those of Sub-Saharan Africa but were less than those of the world countries in both years. However, the standard deviations of cross-national interaction variables were still substantial indicating that the variations in the sizes of economic interaction and educational articulation variables were large across Arab states in 1990 and 2000.

While the averages of cross-national inequality variables as difference in life expectancy, difference in per capita gross national income and difference in gross enrollment ratio for Arab states were less than those of Sub-Saharan Africa, but they were similar to the patterns of all the world countries. However, based on the values of standard deviations, the variations in these cross-national inequality variables were insignificant across Arab states in both years. On the other hand, the averages of total



Table 30: Arab States Based on Regional and Industrial Aggregates  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	17	692.32	1028.00	18	905.66	1586.00
U.S. Import	17	1093.00	2470.00	18	1665.00	3522.00
U.S. Investment	17	225.41	530.95	18	696.78	1188.00
Foreign Investment in the U.S.	17	222.65	597.27	18	53.50	214.09
Number of Students in the U.S.	17	1409.00	1411.00	18	1460.00	1417.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	17	11.38	6.05	18	9.51	8.14
Difference in Per Capita Gross National Income	17	16245.00	6067.00	18	29879.00	4684.00
Difference in Gross Enrollment Ratio	16	30.31	15.20	18	32.83	17.11
Difference in Expenditure for Research & Development	6	2.56	0.09	4	2.44	0.13
Difference in Professional Unemployment Ratio	3	-0.07	0.04	4	-0.08	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	3	9495.00	16026.00	4	7298.00	5809.00
Total Occupational Unemployment	3	457856.00	769660.00	4	553540.00	791467.00
Total Unemployment	6	554803.00	581687.00	9	446055.00	606057.00
Total Population	17	12499.00	14326.00	18	14946.00	17279.00
<u>Migration</u>						
Professional Migration	17	220.18	318.68	18	185.89	242.74
Nonprofessional Migration	17	384.06	496.26	18	251.67	337.09
Total Migration	17	1452.00	1784.00	18	1705.00	1722.00

population were 12,499 million with a (SD) of 14,326 in 1990 and 14,946 million with a (SD) of 17279 in 2000. These were less significant than those of all the world countries,

but there were substantial variations in the amount of total population across Arab states in both years.

The average numbers of professional migration, nonprofessional migration and total migration were significantly less than the averages of the world countries, but higher than the averages of Sub-Saharan African countries. However the magnitudes of standard deviations of these variables were still significant in that the variations in the volumes of professional migration, nonprofessional migration, and total migration were important among Arab states in both years.

Table 31 exhibits the observation numbers, means, and standard deviations of variables for Latin America and Caribbean countries based on regional and industrial aggregates during 1990 and 2000. The averages of cross-national interaction variables of this group were usually higher than those of the other Sab-Saharan Africa and Arab states, but lower than those of all the world countries in both years. The standard deviations of these variables seemed to be significant indicating that the variations in the values of cross-national interaction variables were substantial across the countries of Latin America and Caribbean group in 1990 and 2000.

The means of cross-national inequality variables based on difference in life expectancy, difference in gross enrollment ratio for Latin America and Caribbean countries were lower than the averages of Sub-Saharan Africa, Arab states and all the world countries, but the averages of difference in per capita gross national income and difference in expenditure for research and development were higher than those of all the world countries. However, apart from difference in professional unemployment ratio in 1990, the standard deviations of all cross-national inequality variables were not

important. That means the variations in the values of these variables were insignificant across Latin America and Caribbean countries in both years.

Table 31: Latin America and Caribbean Countries Based on Regional and Industrial Aggregates Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	45	563.77	934.92	44	1338.00	2581.00
U.S. Import	45	748.81	1850.00	44	1666.00	3594.00
U.S. Investment	45	444.96	1714.00	45	2876.00	7542.00
Foreign Investment in the U.S.	45	450.27	2021.00	45	283.87	844.67
Number of Students in the U.S.	45	828.56	934.96	45	1140.00	1782.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	37	6.57	5.14	37	5.90	5.18
Difference in Per Capita Gross National Income	39	18970.00	2510.00	37	29677.00	3894.00
Difference in Gross Enrollment Ratio	24	26.58	9.10	32	25.50	8.31
Difference in Expenditure for Research & Development	15	2.27	0.53	14	2.38	0.19
Difference in Professional Unemployment Ratio	15	-0.02	0.14	14	-0.08	0.04
<u>Unemployment and Population</u>						
Professional Unemployment	15	20994.00	27995.00	14	34776.00	52707.00
Total Occupational Unemployment	17	206473.00	218346.00	16	341651.00	419518.00
Total Unemployment	26	235694.00	473182.00	23	655339.00	1599241.00
Total Population	45	7936.00	22823.00	45	9332.00	26352.00
<u>Migration</u>						
Professional Migration	45	443.80	609.40	45	227.67	326.90
Nonprofessional Migration	45	4094.00	9406.00	45	761.82	1333.00
Total Migration	45	7715.00	14536.00	45	4681.00	7172.00

The averages of unemployment and population variables were significantly smaller than the averages of all the world countries, but standard deviations of these variables showed extensive variations in the volumes of professional unemployment, total occupational unemployment, total unemployment, and total population among the countries of Latin America and Caribbean group in 1990 and 2000.

Although for this group, the mean numbers of professional migration, nonprofessional migration, and total migration were larger than the averages of other Sub-Saharan Africa and Arab states, they were lower than the averages of all the world countries in both years. However, the standard deviations of these variables showed that the variations in the volumes of professional migration, nonprofessional migration and total migration were substantial across Latin America and Caribbean countries in both years.

Table 32 shows the observation numbers, means and standard deviations of variables for Asian and Pacific countries based on regional and industrial aggregates during 1990 and 2000. The observation numbers of difference in expenditure for research and development in 2000, and difference in professional unemployment ratio, professional unemployment and total occupational unemployment in both years were less than ten so that they were eliminated from the correlation analyses. The averages of all cross-national interaction variables of Asian and Pacific group were higher than the averages of Sub-Saharan Africa, Arab states, and Latin America and Caribbean groups. On the other hand, the averages of the U.S. export, U.S. import and foreign investment in the U.S. variables in 1990 were lower than the means of all the world countries in both years. All in all the standard deviations of all cross-national interaction variables still appeared large representing that the variations in the levels of cross-national interactions were huge among Asian and Pacific countries in both years.

Based on cross-national inequality variables, the means of difference in life expectancy and difference in gross enrollment ratio of this group were higher than the

Table 32: Asian and Pacific Countries Based on Regional and Industrial Aggregates  
Mean and Standard Deviation of Variables by Years

Variable	N	1990 Mean	Std Dev	N	2000 Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	44	1397.00	3159.00	43	3144.00	6896.00
U.S. Import	44	2270.00	5169.00	43	6965.00	17619.00
U.S. Investment	44	507.31	1267.00	43	2471.00	6020.00
Foreign Investment in the U.S.	44	335.09	1960.00	43	381.60	1353.00
Number of Students in the U.S.	44	3839.00	7598.00	43	5420.00	12469.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	31	12.73	8.62	30	11.06	8.13
Difference in Per Capita Gross National Income	36	19358.00	3096.00	38	29524.00	7456.00
Difference in Gross Enrollment Ratio	26	34.31	15.94	27	34.78	16.15
Difference in Expenditure for Research & Development	12	2.20	0.52	9	1.71	0.85
Difference in Professional Unemployment Ratio	7	-0.06	0.04	8	-0.04	0.07
<u>Unemployment and Population</u>						
Professional Unemployment	7	281257.00	714339.00	8	485384.00	1287460.00
Total Occupational Unemployment	8	4603824.00	12138787.00	8	5712388.00	14418302.00
Total Unemployment	16	2933925.00	8516091.00	18	3577589.00	9620600.00
Total Population	42	67761.00	217124.00	41	78940.00	249757.00
<u>Migration</u>						
Professional Migration	44	1021.00	2388.00	43	816.53	2170.00
Nonprofessional Migration	44	1744.00	3739.00	43	701.51	1683.00
Total Migration	44	7056.00	14090.00	43	5271.00	11787.00

averages of Arab states and Latin America and Caribbean groups, but the means of difference in expenditure for research and development were smaller than those of Sub-Saharan Africa, and Latin America and Caribbean groups. Since the magnitudes of standard deviations for these variables were not important, which means the variations in the values of cross-national inequality variables were not important across the countries of Asia and Pacific group in both years.

The averages and standard deviations of total unemployment and total population of Asian and Pacific countries were extensively higher than the averages of other three groups and the averages of all the world countries. In this sense, the variations in the numbers of total unemployment and total population were huge across the countries of Asian and Pacific countries in both years.

The mean numbers of professional migration of Asian and Pacific countries were 1,021 with a (SD) of 2,388 in 1990 and 8,16.53 with a (SD) of 2,170 in 2000 leading the averages of the previous three groups and the averages of all the world countries. The averages of total migration of this group were also higher than those of the other three groups and the averages of world countries in 1990 and 2000. Evidenced from standard deviations of these variables, the variations in the volumes of professional migration, nonprofessional migration, and total migration were large across Asian and Pacific countries in both years.

Table 33 displays the observation numbers, means, and standard deviations of the variables for OECD countries based on regional and industrial aggregates in 1990 and 2000. The averages of cross-national interaction variables of OECD countries based on U.S. export and import, U.S. investment, foreign investment in the U.S. and the number of student in the U.S. were extensively higher than the averages of previous four groups,

and the averages of all the world countries in both years. The standard deviations of these variables were also substantial indicating that the variations in the values of cross-national interaction variables were large across the OECD countries in both years. On the

Table 33: OECD Countries Based on Regional and Industrial Aggregates  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	23	12182.00	19457.00	23	19346.00	38253.00
U.S. Import	23	14080.00	25606.00	23	27053.00	54587.00
U.S. Investment	23	14383.00	19936.00	23	38853.00	56317.00
Foreign Investment in the U.S.	23	15950.00	28127.00	23	49163.00	65339.00
Number of Students in the U.S.	23	3889.00	6106.00	23	5507.00	10334.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	23	0.03	1.77	22	-1.18	1.15
Difference in Per Capita Gross National Income	23	3794.00	7635.00	23	9991.00	8803.00
Difference in Gross Enrollment Ratio	23	12.22	7.50	22	0.50	10.11
Difference in Expenditure For Research & Development	22	1.20	0.78	21	0.77	0.84
Difference in Professional Unemployment Ratio	17	-0.02	0.05	17	-0.02	0.05
<u>Unemployment and Population</u>						
Professional Unemployment	17	49484.00	71119.00	18	98246.00	141585.00
Total Occupational Unemployment	18	786537.00	960250.00	17	948505.00	1156937.00
Total Unemployment	23	805437.00	920048.00	21	931670.00	1200418.00
Total Population	23	27438.00	33252.00	23	24749.00	32274.00
<u>Migration</u>						
Professional Migration	23	1427.00	3233.00	23	569.30	927.46
Nonprofessional Migration	23	20869.00	94890.00	23	237.52	314.04
Total Migration	23	33012.00	140915.00	23	2806	4290

other hand, the means of cross-national inequality variables were smaller than the averages of first four groups and the averages of all the world countries. Apart from difference in gross enrollment ratio and difference in expenditure for research and development variables in 1990, the standard deviations of all other variables were still substantial indicating that the variations in the values of other differences variables were considerable among the OECD countries.

The mean numbers of professional unemployment, total occupational unemployment, total unemployment, and total population variables were higher than the mean numbers of other Sub-Saharan Africa, Arab states, Latin America and Caribbean but lower than the averages of Asia and Pacific group in both years. On the other hand, apart from total unemployment and total population variables in 1990, the means of other variables were lower than the averages of all the world countries. The standard deviations of these variables were still large showing that the variations in the volumes of professional unemployment, occupational unemployment, total unemployment, and total population were important across the OECD countries in 1990 and 2000.

The average volumes of professional migration, non professional migration and total migration from OECD countries to the U.S. in 1990 were extensively larger than the averages of other four groups and the averages of all the world countries. However, for this group the average sizes of these three migration categories in 2000 were relatively lower than those averages of other groups apart from Sub-Saharan Africa. The magnitudes of standard deviations of these variables were substantial indicating that the variations in the numbers of professional migration, nonprofessional migration, and total migration were large across the OECD countries during both the years.



Table 34 illustrates the observation numbers, means, and standard deviations of variables for Eastern Europe and former U.S.S.R. countries based on regional and industrial aggregates in 1990 and 2000. The observation numbers of professional

Table 34: Eastern Europe and Former U.S.S.R. Countries Based on Regional and Industrial Aggregates Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	30	266.10	662.23	29	218.06	410.88
U.S. Import	30	139.07	251.22	29	586.48	1467.00
U.S. Investment	30	16.33	68.79	29	386.59	895.43
Foreign Investment in the U.S.	30	8.13	31.45	29	132.34	638.20
Number of Students in the U.S.	30	100.27	252.02	29	871.10	1413.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	29	5.24	1.38	27	6.27	2.96
Difference in Per Capita Gross National Income	22	19430.00	764.29	28	31723.00	2481.00
Difference in Gross Enrollment Ratio	25	18.16	6.70	26	20.46	7.23
Difference in Expenditure for Research & Development	18	1.75	0.56	18	1.96	0.39
Difference in Professional Unemployment Ratio	9	0.00	0.04	14	-0.02	0.06
<u>Unemployment and Population</u>						
Professional Unemployment	9	52256.00	65766.00	14	217493.00	493067.00
Total Occupational Unemployment	14	811364.00	1084159.00	14	1313013.00	2474594.00
Total Unemployment	23	342354.00	850587.00	24	876949.00	1943012.00
Total Population	30	21389.00	45714.00	28	14712.00	28045.00
<u>Migration</u>						
Professional Migration	30	216.60	638.25	30	342.00	509.55
Nonprofessional Migration	30	632.00	2036.00	30	525.67	828.98
Total Migration	30	1508.00	4880.00	30	3141.00	4633.00

unemployment ratio and professional unemployment were less than ten in 1990 so that they were not used in the correlation analyses. For Eastern Europe and former U.S.S.R. countries the averages of all cross-national interaction variables except the U.S. export were the lowest among six groups of this category in 1990, and the averages of these variables were the second lowest in 2000. The variations in the levels of cross-national interaction between the U.S. and the countries of this group were extensive across Eastern Europe and former U.S.S.R. countries in both years.

The averages of difference in expenditure for research and development in 1990, and difference in life expectancy, and difference in gross enrollment ratio in both years were the second lowest after OECD countries, but the averages of difference in per capita gross national income were the second highest after Sub-Saharan countries. However, the variations in the values of cross-national inequality variables were insignificant across Eastern Europe and former U.S.S.R. countries in both years.

Although, the mean numbers of total occupational unemployment were second largest after Asia and Pacific group, the averages of total unemployment and total population were the third highest after Asia and Pacific and OECD countries in both years. The standard deviations of these variables indicate that the variations in the sizes of total occupational unemployment, total unemployment and total population were extensive across Eastern Europe and former U.S.S.R. countries in 1990 and 2000. In 1990 professional migration of this group averaged 216.6 that is the second lowest after Sub-Saharan Africa, and in 2000 it averaged 342 that is third largest after OECD and Asia Pacific groups. The mean numbers of nonprofessional migration were 632 in 1990 and 525.67 in 2000 that were the fourth largest among the six groups. The average numbers of total migration for this group were 1508 in 1990 and 3141 in 2000, which is

different from the general tendency of the total migration numbers being higher during 1990 than during 2000. On the other hand the standard deviations of these variables indicated that the variations in the volumes of professional migration, nonprofessional migration, and total migration were extensive across Eastern Europe and former U.S.S.R. countries in both years.

Table 35 represents the observation numbers, means, and standard deviations of variables for other countries based on regional and industrial aggregates in 1990 and 2000. Apart from difference in per capita gross national income variable of cross-national inequality group in 2000 and total population variable of unemployment and population group in 1990 and 2000, other variables of these two groups had less than ten observations, so that they were eliminated from correlation analyses.

Although the averages of interaction variables in 1990 for the other group were relatively lower than the averages of most of the other six groups, in 2000 the averages of these variables for the other group were the second highest after the OECD countries. The standard deviations of these variables showed that the variations in the levels of international interaction variables were extensive across other group countries in both years. The averages of total population of other countries were 5,644 million in 1990 with a (SD) of 16,786, and 22,122 million with a (SD) of 37,176 in 2000, which is the third highest among the seven groups.

The mean numbers of professional migration for other group were 129.45 in 1990 that is the second lowest after Sub-Saharan Africa, and 273.36 in 2000 that is the fourth largest among the seven groups. On the other hand, the average numbers of nonprofessional migration and total migration for the other group were the lowest among all the seven groups in 1990 apart from Sub-Saharan Africa, but the average of total

Table 35: Other Countries Based on Regional and Industrial Aggregates  
Mean and Standard Deviation of Variables by Years

Variable	1990			2000		
	N	Mean	Std Dev	N	Mean	Std Dev
<u>Cross-National Interaction</u>						
U.S. Export	11	539.95	1103.00	11	11256.00	33285.00
U.S. Import	11	416.57	1023.00	11	13879.00	40663.00
U.S. Investment	11	1953.00	6047.00	11	9012.00	19279.00
Foreign Investment in the U.S.	11	206.82	484.34	11	2657.00	5773.00
Number of Students in the U.S.	11	725.55	1158.00	11	2141.00	4108.00
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	5	6.52	8.58	9	1.44	4.85
Difference in Per Capita Gross National Income	7	15010.00	2877.00	10	25807.00	4272.00
Difference in Gross Enrollment Ratio	4	21.25	9.91	6	22.17	7.73
Difference in Expenditure For Research & Development	3	1.88	1.09	4	1.46	1.60
Difference in Professional Unemployment Ratio	4	0.03	0.11	5	-0.04	0.05
<u>Unemployment and Population</u>						
Professional Unemployment	4	11249.00	16151.00	5	35382.00	41004.00
Total Occupational Unemployment	4	264956.00	427096.00	6	269300.00	336724.00
Total Unemployment	8	223330.00	564957.00	8	292040.00	520623.00
Total Population	11	5644.00	16786.00	11	22122.00	37176.00
<u>Migration</u>						
Professional Migration	11	129.45	287.29	11	273.36	405.60
Nonprofessional Migration	11	154.36	300.97	11	1275.00	3801.00
Total Migration	11	703.55	1502.00	11	17105.00	52074.00

migration was the highest among the seven groups in 2000. The standard deviations of these variables showed that the variations in the number of professional migration,

nonprofessional migration, and total migration were extensively large across other countries in both years.

Summary: Each group of the five main categories of all the world countries showed some common patterns for the values of cross-national interaction variables, cross-national inequality variables, and unemployment and population variables in 1990 and 2000. Such as the values of cross-national interaction variables, the differences between the U.S. and immigrant sending countries in values of cross-national inequality variables, and the volumes of unemployment and total population variables relatively increased from 1990 to 2000. However, most of the groups of the five main categories of all the world countries showed a strong tendency that the volumes of migration variables based on professional migration, nonprofessional migration and total migration usually decreased significantly from 1990 to 2000. This tendency can be explained as a consequence of the Immigration and Reform Control Act (IRCA) of 1986 that gave an opportunity to 2.6 million former illegal aliens in the U.S. to gain permanent resident status during 1989-1992.

#### The Analyses of Data Based on Correlation Coefficient

The most widely used measure of association in the social science is Pearson's product-moment correlation coefficient that is generally called correlation coefficient and symbolized  $r$ . "The correlation coefficient  $r$  is a summary measure of how tightly cases are clustered around the regression line" (Fox, 1995: 169). If cases are distributed very closely along the regression line,  $r$  will have a high value showing a strong relationship. If cases are widely distributed along regression line,  $r$  will have a small value indicating a weak relationship. Consequently  $r$  ranges between  $-1.00$  and  $+1.00$ .  $r = -1.00$  indicates

negative perfect relationship,  $r = +1.00$  indicates positive perfect relationship, and  $r = 0$  denotes no relationship between two variables.

Although there are no absolute rules to determine which level of  $r$  is strong or moderate to show the measure of associations among the variables, Fox (1995: 171) suggests the following equivalents for the magnitudes of  $r$  that are based for this research to classify the levels of correlations among the variables.

$r \geq .70$  Very strong relationship

$.50 \leq r < .70$  Strong relationship

$.20 \leq r < .50$  Moderate relationship

$.10 \leq r < .20$  Weak relationship

$r < .10$  No or negligible relationship

The research data were analyzed based on correlation coefficient to show the relationships among migration variables and structural variables of immigrant sending countries to the United States in general. Although migration variables consist of professional migration, nonprofessional migration, and other migration for the analyses of percentage distributions of migration variables across the different groups of each of five main world categories, migration variables consist of professional migration, nonprofessional migration, and total migration for the correlation analyses of these migration variables with variables of cross-national interaction, cross-national inequality, and unemployment and population for each group of five main world categories.

On the other hand, in specific, the research focused more on the associations of the size of professional immigration from all the world countries to the U.S. with and

structural factors of these immigrant sending countries based on cross-national interaction cross-national inequality variables.

At the beginning all the world countries were investigated together to show the connections among the migration variables and the structural variables of immigrant sending countries to the U.S. After that all the world countries were divided into five categories consisting of several groups to illustrate differences among them. And then, each group was examined for the associations between their volumes of migration categories and the levels of their structural variables

First, this study tested each group of five categories for the correlations between their volumes of professional migration, nonprofessional migration, and total migration with their cross-national interaction variables based on the amount of U.S. export, U.S. import, U.S. investment, foreign investment in the U.S. and number of students in the U.S. Second, this study examined the correlations between the sizes of professional migration, nonprofessional migration, and total migration with cross-national inequality variables based on the levels of difference in life expectancy, difference in per capita gross national income, difference in gross enrollment ratio, difference in expenditure for research and development, and difference in professional unemployment ratio. Third, this study also investigated the associations of the volumes of professional migration, nonprofessional migration, and total migration with the amount of unemployment and population variables based on the numbers of professional unemployment, total occupational unemployment, total unemployment, and total population for each group of five categories in 1990 and 2000.

Table 36 represents all the world countries for correlation coefficients of migration variables with cross-national interaction, cross-national inequality, and

Table 36: All the World Countries  
General Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.40***	.25***	.27***	.30***	.35***	.51***
U.S. Import	.36***	.21**	.23***	.40***	.39***	.50***
U.S. Investment	.26***	.08	.10	.26***	.08	.16*
Foreign Investment in the U.S.	.14*	-.01	.01	.20**	.01	.06
Number of Students in the U.S.	.48***	.10	.15*	.70***	.37***	.36***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.11	-.04	-.05	-.11	-.10	-.10
Difference in Per Capita Gross National Income	.00	.04	.04	.00	.12	.05
Difference in Gross Enrollment Ratio	-.13	-.02	-.03	-.14	-.06	-.07
Difference in Expenditure for Research & Development	.04	.09	.09	-.10	.12	.07
Difference in Professional Unemployment Ratio	-.09	-.07	-.07	.03	-.03	-.01
<u>Unemployment and Population</u>						
Professional Unemployment	.33**	-.01	.03	.86***	.23	.22
Total Occupational Unemployment	.31**	.00	.03	.90***	.23	.22
Total Unemployment	.30**	.01	.05	.75***	.26**	.26**
Total Population	.38***	.07	.11	.81***	.43***	.36***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .



unemployment and population variables during 1990 and 2000. The associations between the size of professional migration and cross-national interaction variables, apart from foreign investment in the U.S., were moderate and statistically significant. The nonprofessional and total migration variables had statistically significant moderate positive correlations with U.S. export and U.S. import variables in 1990. Although the volume of professional migration had moderate positive associations with cross-national interaction variables that are statistically significant, it had a very strong positive association with number of students in the U.S. variable because the correlation is .70. in 2000. Although nonprofessional migration had a moderate positive relationship with U.S. export and U.S. import variables, total migration appeared to have strong positive relationships with the same variables, and both variables were moderately associated with number of student in the U.S.

On the other hand, there were no substantially and statistically significant correlations between all migration variables and all cross-national inequality variables in both years. Professional migration had a negative weak relationship with difference in life expectancy and difference in gross enrollment ratio in 1990. The associations of each migration variables with difference in life expectancy were weak negative in Although professional migration had a weak negative association with difference in gross enrollment ratio and difference in expenditure research and development, nonprofessional migration had a weak positive relationship with difference in per capita gross national income and difference in expenditure for research and development variables in 2000. Thus, the differences between immigrant sending countries and the U.S. in the values of cross-national interaction variables were not associated with the

volumes of their professional migration, nonprofessional migration and total migration to the U.S. in 1990 and 2000.

2000.

While professional migration had moderate positive associations with unemployment and population variables, nonprofessional migration and total migration did not have any important correlation with unemployment and population variables in 1990. Although professional migration variable had very strong positive correlations with all unemployment and population variables, nonprofessional and total migration seemed to have only moderate positive correlations with total unemployment and total population variables in 2000.

Tables 37 through Table 59 show the correlations among migration variables and structural variables of immigrant sending countries based on cross-national interaction variables, cross-national inequality variables, and unemployment and population variables for each group of five categories of all the world countries in 1990 and 2000.

#### The Correlation Analyses Of The Migration Variables With Structural Variables For Six Groups Of All The World Countries Based On Regional Category

Tables 37 through Table 42 illustrate the correlation analyses of migration variables with structural variables of six groups of the world countries based on regional category in both years.

Table 37 represents the correlation coefficients of migration variables with cross-national interaction, cross-national inequality, and unemployment and population variables for European countries based on regional category in 1990 and 2000. The correlations coefficients between the size of professional migration and the levels of

Table 37: Europe Based on Regional Category  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.57***	.26	.46***	.60***	.09	.30*
U.S. Import	.50***	.23	.40**	.62***	.15	.35*
U.S. Investment	.63***	.27*	.45***	.63***	.09	.32*
Foreign Investment in the U.S.	.56***	.23	.39**	.59***	.09	.28*
Number of Students in the U.S.	.57***	.31*	.44***	.75***	.31*	.57***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.21	-.08	-.12	.07	.21	.24
Difference in Per Capita Gross National Income	-.13	.05	-.13	-.04	.23	.16
Difference in Gross Enrollment Ratio	-.05	.02	.02	-.19	.09	-.03
Difference in Expenditure for Research & Development	-.27	-.13	-.24	-.06	.14	.07
Difference in Professional Unemployment Ratio	-.13	-.20	-.25	.23	.24	.33
<u>Unemployment and Population</u>						
Professional Unemployment	.79***	.70***	.77***	.55**	.54**	.77***
Total Occupational Unemployment	.40*	.36	.43*	.58***	.58***	.78***
Total Unemployment	.35*	.25	.40**	.62***	.60***	.79***
Total Population	.46***	.38**	.70***	.72***	.39**	.74***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

cross-national interactions variables based on U.S. export, U.S. import, U.S. investment, foreign investment in the U.S. and number of students in the U.S. were between .50 and .63 that refer to strong positive relationships among those variables with high statistical significances. The correlations between total migration and five cross-national interaction variables changed between .39 and .46 that indicate moderate positive and statistically significant associations among them. On the other hand, nonprofessional migration had medium positive and statistically significant relationships with only U.S. investment and number of students in the U.S. variables in 1990.

In 2000 the correlations between the professional migration and cross national interaction variables were stronger than in 1990. Professional migration had a very strong positive relationship with student numbers in the U.S. because correlation was .75, and it had strong positive relationships with the other four variables of this group with statistical significances. Total migration was strongly correlated with the student number in the U.S. at .57, but it was moderately positively associated with the other variables of this group with statistical significances. Nonprofessional migration had only moderate positive relationship with number of students in the U.S. whereas it did not have either substantially or statistically significant relationships with the other variables in 2000.

Although there were some substantial correlations among the migration variables and cross-national inequality variables, none of them were statistically significant in both years. In 1990 the correlations between professional migration and cross-national inequality variables were all negative because correlations among them changed from -.05 to -.27. In this base, while the professional migration had a medium negative relationship with difference in life expectancy and difference in expenditure for research and development, it had a negligible or weak negative relationship with other cross-

national interaction variables. Although there was a moderate negative association between nonprofessional migration and difference in professional unemployment ratio, its relationships with other variables of this group were weak or negligible. On the other hand, while total migration had weak negative correlations with the variables of difference in life expectancy and difference in per capita gross national income, it had medium inverse relationships with difference in expenditure for research and development and the difference in professional unemployment ratio in 1990.

In 2000, professional migration had a negligible correlation with difference in life expectancy, but a moderate positive correlation with difference in professional unemployment ratio variable. On the other hand, professional migration had negligible and weak negative associations with other cross-national inequality variables. Nonprofessional migration was usually moderately correlated with difference in life expectancy, difference in per capita gross national income and difference in professional unemployment ratio, but it was weakly correlated with difference in expenditure for research and development. Total migration had moderate positive relationship with difference in life expectancy and difference in professional unemployment ratio variables while it had a weak or negligible association with other variables in 2000.

For European countries, the correlations of migration variables with unemployment and population variables were usually substantial and positive with statistical significances in both years, apart from the correlations of nonprofessional migration with total occupational unemployment and total unemployment variables in 1990. Each of the three migration variables had a very strong relationship with professional unemployment. The correlations of professional migration with total occupational unemployment, total unemployment, and total population variables were

medium positive. The correlation of total migration with total occupational unemployment and total unemployment were medium positive, but it had very strong positive correlations with professional unemployment and total population in 1990.

In 2000, the relationships of professional migration with professional unemployment, total occupational unemployment, and total unemployment were strong positive while its relationship with total population was very strong positive. Nonprofessional migration had a medium relationship with total population, but it had strong positive correlations with other variables of this group. On the other hand, total migration had very strong positive associations with all unemployment and population variables because correlations coefficients among them changed between .74 and .79, in 2000.

As a result, the correlations of professional migration and total migration with cross-national interaction variables were usually medium or strong positive in both years. On the other hand, without any statistical significance all three-migration variables had generally weak or medium negative associations with all cross-national inequality variables in 1990, but they had weak or medium positive relationships with the same variables in 2000. The associations of migration variables with unemployment and population variables were usually changed from medium positive toward very strong positive in 1990, but in 2000, the associations among those variables were generally strong and very strong positive with high levels of statistical significances.

Table 38 shows the correlations among migration variables and structural variables of Asian countries based on regional category during 1990 and 2000. During 1990, the correlations among migration variables and economic interaction variables based on U.S. export, U.S. import, U.S. investment were either weak or negligible and

Table 38: Asia Based on Regional Category  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.13	.05	.10	.20	.13	.22
U.S. Import	.13	.07	.10	.35*	.34*	.38*
U.S. Investment	.07	.00	.03	.08	.03	.08
Foreign Investment in the U.S.	-.02	-.04	-.04	-.00	-.04	.01
Number of Students in the U.S.	.48**	.36*	.42**	.65***	.49***	.52***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.06	.00	.01	-.02	-.00	-.01
Difference in Per Capita Gross National Income	.17	.24	.23	.15	.22	.19
Difference in Gross Enrollment Ratio	-.17	-.00	-.07	-.12	-.12	-.15
Difference in Expenditure for Research & Development	.01	.02	-.06	-.07	-.03	-.12
Difference in Professional Unemployment Ratio	-.17	-.24	-.18	-.15	-.27	-.27
<u>Unemployment and Population</u>						
Professional Unemployment	.82***	.60*	.62*	.98***	.87***	.90***
Total Occupational Unemployment	.82***	.61*	.63*	.96***	.88***	.91***
Total Unemployment	.35	.21	.34	.77***	.43*	.62***
Total Population	.44**	.46**	.41**	.84***	.69***	.77***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

statistically insignificant. The correlations between all three migration variables and foreign investment in the U.S were negligible and negative. However, the three migration variables had moderate positive correlations with number of students in the U.S. as an educational articulation variable because correlation coefficients were .48, .36, and .42 respectively with statistical significances.

In 2000, professional migration, nonprofessional migration and total migration variables had moderate positive relationships with U.S. import variable. While professional migration and total migration variables were strongly correlated with number of students in the U.S., nonprofessional migration variable was moderately associated with number of students in the U.S. On the other hand, the associations of migration variables with other variables of this group were either substantially or statistically insignificant in 2000.

Although the correlations of all the three migration variables with all cross-national inequality variables were statistically insignificant, there were some substantial relations between two groups of variables in both years. In 1990, while the relationship between professional migration and difference in per capita gross national income was weak positive, the relationships of other two migration variables with the same variable were moderate and positive. Professional migration had weak negative associations with difference in gross enrollment ratio and difference in professional unemployment ratio variables because both correlation coefficients were  $-.17$  in 1990. Although there was a medium negative correlation between nonprofessional migration and difference in professional unemployment ratio, total migration had a weak negative association with the same variable in 1990.



In 2000 there was a weak positive relationship between professional migration and difference in per capita gross national income variable. On the other hand, although nonprofessional migration had a moderate positive association with difference in per capita gross national income variable, total migration had a weak positive relationship with the same variable. The three migration variables were weakly but negatively correlated with difference in gross enrollment ratio variable. The association between professional migration and the difference in professional unemployment ratio variables was weak and negative, but the associations between the two other migration variables with difference in professional unemployment were moderate and negative in 2000.

The correlations of professional migration variable with professional unemployment and total occupational unemployment were the same as .82 that indicate a very strong and positive relationship, but the correlations of other two migration variables with the same variables were strong and positive. The correlations of three migration variables with total unemployment were .35, .21 and .34 respectively, but none of them were statistically significant. Each of the three migration variables had a moderate positive significant relationship with total population in 1990.

In 2000, professional migration variable had very strong positive associations with all four unemployment and population variables. The other two migration variables had the similar pattern of associations of professional migration with unemployment and population variables but their magnitudes were smaller than those of professional migration.

In sum, for Asian group, professional migration variable appeared to have stronger relationships with cross-national interaction variables and unemployment and population variables than the two other migration variables had. There were no usually

substantial or statistically significant correlations among the three migration variables and cross-national inequality variables in both years. The correlations of migration variables with unemployment and population variables were usually moderate and strong positive in 1990, but correlations among them were usually strong or very strong positive in 2000.

Table 39 displays correlations among the migration variables and structural variables of African countries based on regional category in 1990 and 2000. The correlations among the migration variables and cross-national interaction variables were generally substantial and significant in both years. In 1990 the correlation between professional migration and U.S. export was .62 that is a strong positive relationship, but correlations of nonprofessional and total migration variables with U.S. export were medium and positive at .27 and .46. Although there was a very strong positive association between professional migration and U.S. import variables because correlation was .73, nonprofessional and total migration variables had a strong positive association with same variable at .68 and .66 respectively. Although the professional migration had a positive medium relationship with U.S. investment variable, the other two migration variables did not have either substantially or statistically important associations with the same variable. The correlations among three migration variables and foreign investment in the U.S. were negligible or weak and statistically insignificant in 1990. On the other hand, all the three migration variables had very strong relationships with number of students in the U.S. because correlations among those variables were .91, .82 and .88 respectively in 1990.

During 2000 for African countries the correlations of professional migration variable with U.S. export and U.S. investment were .67 and .61 indicating strong relationships between those variables. On the other hand, the associations of professional migration with U.S. import and number of student in the U.S. variables were very strong

Table 39: Africa Based on Regional Category  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.62***	.27*	.46***	.67***	.33*	.51***
U.S. Import	.73***	.68***	.66***	.76***	.49***	.62***
U.S. Investment	.28*	-.07	.14	.61***	.26	.44***
Foreign Investment in the U.S.	.05	.09	.10	.20	.05	.18
Number of Students in the U.S.	.91***	.82***	.88***	.70***	.64***	.70***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.09	.03	-.04	-.19	-.19	-.18
Difference in Per Capita Gross National Income	.07	.13	.11	.01	.10	.06
Difference in Gross Enrollment Ratio	-.21	-.04	-.11	-.17	.04	-.02
Difference in Expenditure for Research & Development	.06	.21	.14	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.27	-.02	.13	.70**	.47	.57*
Total Population	.87***	.73***	.82***	.85***	.70***	.81***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

because the correlations were .76 and .70 respectively. The associations of nonprofessional migration with U.S. export and U.S. import variables were medium positive at .33 and .49. while it was strongly related to number of students in the U.S. because correlation was .64. Total migration had strong positive relationships with U.S. export and U.S. import variables, but it was moderately correlated with U.S. investment. The correlation between total migration and number of students in the U.S. was .70 that is very strong positive relationship between two variables in 2000.

Although the correlations of the three migration variables with cross-national inequality variables were usually weak or negligible, none of these correlations were statistically significant in both years. In 1990 migration variables had usually negligible negative correlations with difference in life expectancy variable. Although professional migration had a negligible positive relationship with difference in per capita gross national income, nonprofessional and total migration variables had weak positive associations with same variable. While there was a moderate negative correlation between professional migration and difference in gross enrollment ratio, the correlation of total migration variable with the same variable was weak negative. Although professional migration did not have a significant relationship with difference in expenditure for research and development variable, total migration had a weak association, but nonprofessional migration had a moderate positive association with the same variable in 1990.

During 2000 professional migration, nonprofessional migration and total migration variables were weakly and negatively associated with difference in life expectancy because the correlations among them were -.19, -.19, and -.18 respectively. The correlations of professional migration and total migration variables with difference in

per capita gross national income were negligible whereas the association of nonprofessional migration with the same variable was weak positive. Although professional migration had a weak negative relationship with difference in gross enrollment ratio, the other two migration variables did not have any significant relationship with that variable in 2000.

The data for difference in research expenditure variable in 1990, and the data for difference in professional unemployment ratio, professional unemployment, and total occupational unemployment variables in 1990 and 2000 were not enough to conduct a correlation analyses to test their associations with migration variables in this research.

However, although professional migration had a moderate positive association and total migration had a weak positive relationship with total unemployment variable, none of them were statistically significant in 1990. On the other hand, professional migration, nonprofessional migration and total migration had very strong positive associations with total population in 1990 because the correlations were .87, .73, and .82 respectively.

In 2000, the correlation between professional migration and total unemployment was very strong and positive at .70. While the correlation between nonprofessional and total unemployment was .47 that indicates a moderate positive association without statistical insignificance, the association between total migration and total unemployment was strong positive at .57. Although each of the three migration variables had a very strong positive correlation with total population in both years, the relationship of professional migration with total population variable was stronger than those correlations of nonprofessional and total migration variables with the same variable in 1990 and 2000.

In sum, for African countries although there is an increasing pattern in the relationships of professional migration with U.S. export, U.S. investment, and total unemployment variables, there is usually a decreasing pattern in the associations of the three migration variables with other structural variables from 1990 to 2000.

Table 40 shows the correlations of migration variables with structural variables for Oceania countries based on regional category in 1990 and 2000. Professional migration had very strong positive associations with all five cross-national interaction variables based on U.S. export, U.S. import, the U.S. investment, foreign investment in the U.S., and number of students in the U.S. because correlations coefficients were changed between .86 and .97 among those variables in 1990. Although the correlations of nonprofessional migrations with all cross-national interaction variables were moderate and positive, they were not statistically significant. On the other hand, total migration had strong positive relationships with all cross-national interaction variables in that the correlations among them were changed from .60 to .65 with statistical significances.

During 2000, the correlations among all the three migration variables and cross-national interaction variables were stronger than the correlations in 1990. In this base, professional migration was very strongly correlated with all cross-national interaction variables changing between .89 and .98. Nonprofessional migration was moderately and positively associated with all economic interaction variables, but only its correlation with U.S. import variable was statistically significant. The relationship between nonprofessional migration and number of students in the U.S. variable was strong positive because correlation was .52 with statistical significance. The associations of total migration with all cross-national interaction variables were very strong positive and

Table 40: Oceania Based on Regional Category  
Correlations Among The Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.95***	.28	.63**	.94***	.43	.78***
U.S. Import	.97***	.29	.65**	.98***	.48*	.82***
U.S. Investment	.91***	.26	.60**	.92***	.43	.77***
Foreign Investment in the U.S.	.92***	.26	.61**	.89***	.40	.75***
Number of Students in the U.S.	.86***	.31	.61**	.98***	.52*	.85***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-	-	-	-	-	-
Difference in Per Capita Gross National Income	-.80***	-.09	-.43	-.61*	-.17	-.42
Difference in Gross Enrollment Ratio	-	-	-	-	-	-
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	-	-	-	-	-	-
Total Population	.94***	.27	.62**	.92***	.44	.77***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

statistically significant in that the correlations among them were changed from .75 to .85 for Oceania countries in 2000.

Apart from difference in per capita gross national income variable, the correlations of three migration variables with all cross-national inequality variables could not be analyzed due to lack of data in 1990 and 2000. There was a very strong negative association between professional migration and difference in per capita gross national income variables because correlation was  $-.80$  with statistical significance in 1990. The correlation was  $-.09$  between nonprofessional migration and difference in per capita gross national income that indicates negligible negative and statically insignificant relationship in 1990. On the other hand, the correlation was  $-.43$  between total migration and the same variable that refers to a modest negative but statically insignificant relationship.

During 2000 professional migration had a strong negative relationship with difference in per capita gross national income because correlation was  $-.61$ . On the other hand, while the correlation between nonprofessional migration and difference in per capita gross national income variable was  $-.17$  indicating a weak negative relationship, the total migration had a moderate negative association with the same variable at  $-.42$ , both correlations were statistically insignificant for Oceania countries in 2000.

Apart from total migration, unemployment and population variables in both years had serious missing data so that they could not be analyzed based on correlation coefficient technique in this research. The correlation between professional migration and total population was  $.94$  that is very strong positive relationship in 1990. Nonprofessional was moderately and positively correlated with total population but it was not statistically significant. The correlation between total migration and total population was  $.62$  that



refers to a strong positive association with statistical significance between two variables in 1990.

In 2000 again professional migration had a very strong positive relationship with total population in that correlation was .92. The correlation between nonprofessional and total population was .44 that indicates a moderate positive but statistically insignificant relationship. The correlation between total migration and total population was .77 that refers to a very strong positive relationship with statistical significance for Oceania countries.

Table 41 exhibits the correlations among the migration variables and structural variables of North American countries based on regional category in 1990 and 2000. During 1990, professional migration variable had strong positive correlations with U.S. export, U.S. export and number of students in the U.S. variables at .51, .51 and .53 respectively with statistical significances. Although professional migration also had a moderate positive relationship with U.S. investment and a weak positive relationship with foreign investment in the U.S. variables, the correlations among them were not statistically significant in 1990 for North American countries. On the other hand, although both nonprofessional migration and total migration had moderate positive correlations with U.S. export, U.S. export, and numbers of students in the U.S. variables, their associations with all cross-national interaction variables were statistically insignificant in 1990

During 2000, professional migration was very strongly and positively associated with all cross-national interaction variables because the correlations among them were changed from .75 to .87. On the other hand, nonprofessional migration had a moderate relationship with U.S. export and U.S. export variables while total migration were

Table 41: North America Based on Regional Category  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.51**	.29	.30	.82***	.41*	.55***
U.S. Import	.51**	.28	.30	.82***	.39*	.53**
U.S. Investment	.32	.10	.11	.75***	.13	.25
Foreign Investment in the U.S.	.18	-.03	-.02	.82***	.00	.09
Number of Students in the U.S.	.53***	.30	.31	.87***	.34*	.44**
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.08	.10	.10	-.09	.19	.07
Difference in Per Capita Gross National Income	-.03	.10	.10	-.28	.30	.13
Difference in Gross Enrollment Ratio	-.17	.02	.01	-.57**	.06	-.05
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	.05	-.12	-.11	.62	.28	.37
<u>Unemployment and Population</u>						
Professional Unemployment	.32	.08	.09	.95***	.28	.36
Total Occupational Unemployment	.67*	.45	.47	.93***	.44	.46
Total Unemployment	.63**	.41	.44	.93***	.47	.49
Total Population	.98***	.94***	.95***	.47**	.84***	.96***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

strongly and positively correlated with the same variables. Both nonprofessional and total migration variables had a moderate positive relationship with the number of students in the U.S. The rest of correlation among migration variables and cross-national interaction variables were statistically or substantially insignificant in 2000.

Due to missing data, the correlations of difference in expenditure for research and development variable with migration variables were not included in the analysis in 1990 and 2000. During 1990 there were no statistically significant correlations among migration variables and cross-national inequality variables even though some of them were substantial. Only the relationship between professional migration and difference in gross enrollment ratio was weak negative because correlation was  $-.17$  whereas both nonprofessional and total migration variables had a weak positive association with difference in life expectancy and difference in per capita gross national income. The other correlations among migration variables and cross-national inequality variables were not substantially and statistically significant in 1990.

During 2000 professional migration had a moderate negative association with difference in per capita gross national income with no statistical significances, but a strong negative association with difference in gross enrollment ratio variable at  $-.57$  with statistical significance. On the other hand, while nonprofessional migration had a weak positive association with difference in life expectancy and a moderate positive relationship with difference in per capita gross national income, total migration seemed to have a weak relationship with only difference in per capita gross national income variable, but none of these correlations were statistically significant in 2000.

In 1990 for the North American countries the correlation between professional migration and professional unemployment was .32 that indicates a moderate positive but insignificant relationship between two variables. Although professional migration had strong positive associations with total occupational unemployment and total unemployment, it had a very strong association with total population. While the relationship between nonprofessional migration and professional unemployment was negligible, nonprofessional migration was moderately positively associated with total occupational unemployment and total unemployment without statistical significances. However, nonprofessional migration had a very strong significant relationship with total population because the correlation was .94 between the two variables. On the other hand, total migration variable had the same pattern of correlations for nonprofessional migration variable with unemployment and population variables.

In 2000, although professional migration had very strong positive associations with professional unemployment, total occupational unemployment and total unemployment variables because the correlations were .95, .93 and .93 respectively, it had a moderate positive relationship with total migration at .47. even though the correlations of both nonprofessional migration and total migration with professional unemployment, total occupational unemployment and total unemployment variables were moderate and positive, none of them were statistically significant. However, both nonprofessional and total migration had very strong associations with total population because correlations were .84 and .96 respectively with statistical significances for North American countries.

In short, although professional migration had usually strong positive relationships with cross-national interaction variables, nonprofessional and total migration did not have

any significant correlations with the same variables in 1990. In 2000, the correlations of professional migration variable with all five cross-national interaction variables were very strong and positive. While nonprofessional migration relatively had moderate positive relationships with cross-national interaction variables, total migration had relatively strong positive associations with those variables. Even though professional migration usually had negative associations with cross-national interaction variables, the other two migration variables generally had positive insignificant relationships with all cross-national inequality variables in 1990. In 2000 while professional migration was strongly negatively correlated with difference in gross enrollment ratio variable with statistical significance, none of the other correlations among migration variables and other cross-national inequality variables were statistically significant. While professional migration had a high level positive association with total occupational unemployment, total unemployment, and total population variables, nonprofessional and total migration variables had only very strong statistically significant positive relationships with total migration variable in 1990. In 2000 while professional migration was moderately positively associated with total population, it had very strong positive correlations with other three unemployment and population variables. On the other hand, whereas nonprofessional and total migration variables had very strong positive correlations with total population they had no statistically significant relationships with the other unemployment and population variables in 2000 for North American countries.

Table 42 represents the correlations among migration variables and structural variables of South American countries in 1990 and 2000. The three migration variables had only a strong positive and statistically significant correlation with number of students in the U.S. among all the five cross-national interaction variables. Even though these

Table: 42 South America Based on Regional Category  
Correlations Among The Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.27	.11	.15	.69**	.14	.34
U.S. Import	.23	.05	.09	.69**	.16	.40
U.S. Investment	.50	.33	.34	.59*	.05	.23
Foreign Investment in the U.S.	.24	-.16	-.09	.53*	-.06	.14
Number of Students in the U.S.	.68**	.53*	.58*	.92***	.45	.69**
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.20	.14	.18	.16	.41	.23
Difference in Per Capita Gross National Income	.50	.47	.52	.00	.44	.27
Difference in Gross Enrollment Ratio	-.24	.20	.18	-.05	.06	-.00
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.33	.02	.10	.67*	.17	.30
Total Population	.24	.08	.13	.70**	.22	.40

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

three migration variables had relatively substantial correlations with the other four cross-national interaction variables, none of them were statistically significant in 1990.

During 2000, professional migration had strong positive associations with U.S. export, U.S. import, U.S. investment, and foreign investment in the U.S. variables whereas it had a very strong positive association with the number of students in the U.S. variable with statistical significances. On the other hand, although total migration had a strong positive and statistically significant correlation with student number in the U.S, neither, nonprofessional migration, nor total migration variable had statistically significant relationships with all the cross-national interaction variables.

Difference in expenditure for research and development, and difference in professional unemployment ratio of the cross-national inequality variables had serious missing data during 1990 and 2000, so that they were excluded from correlation coefficient analyses. Although there were some substantial correlations among migration variables and cross-national inequality variables, none of them were statistically significant in both years. Thus, the correlation between professional migration and difference in life expectancy was .20 indicating a moderate positive association, while the correlation between nonprofessional migration and difference in per capita gross national income was .50 that was a strong positive relationship in 1990. However, the correlation between professional migration and difference in gross enrollment ratio was -.24 that indicates a moderate negative association. On the other hand, while nonprofessional migration had a weak positive relationship with difference in life expectancy, a moderate positive correlation with difference in per capita gross national income and difference in gross enrollment ratio, total migration variable had a weak positive relationship with

difference in life expectancy and difference in gross enrollment ratio, but a strong relationship with difference in per capita gross national income in 1990.

Although professional migration variable was weakly positively correlated with difference in life expectancy, nonprofessional migration and total migration had a moderate positive association with difference in life expectancy and difference in per capita gross national income variables without statistical significances in 2000.

Even though professional migration variable had moderate positive correlations with total unemployment and total population variables at .33 and .24 respectively, none of the other correlations of nonprofessional migration and total migration with the same variables were substantially and statistically significant in 1990. On the other hand, professional migration was strongly positively related with total unemployment variable and very strongly positively connected with total population variable with statistical significances in 2000. Although nonprofessional migration and total migration variables had some substantially significant associations with total unemployment and total population variables, none of them were statistically significant in 2000.

As a result South America region shows an increasing tendency for the relationships of migration variables with cross-national interaction and unemployment and population variables from 1990 to 2000. However, while the relationships of migration variables with cross-national interaction variables had a relatively decreasing pattern from 1990 to 2000, the magnitudes of correlations among these variables were more strong and positive than those of the other five groups in this regional category.

Summary for six regional groups: Although the correlations of professional migration with cross-national interaction variables, cross-national inequality variables, and unemployment and population variables were higher than those correlations of other



nonprofessional migration and total migration variables with the same variables, the magnitudes of correlations of professional migration with those variables changed among the six groups of the regional category in 1990 and 2000.

The levels of correlations of professional migration with cross-national interaction variables from the positive highest toward the negative highest took place in the following order in 1990 and 2000. Relatively Oceania countries group had the first highest correlations of professional migration variable with cross-national interaction variables, Africa was the second, Europe was the third, North America was the fourth, South America was the fifth, and the Asian countries group was the last in 1990. In 2000 Oceania was the first, North America was the second, South America was the third, Europe was the fourth, Africa was the fifth and Asian group again was the last to have the highest correlations of professional migration with cross-national interaction variables.

The order from the positive highest to the negative highest correlations of professional migration with cross-national inequality variables relatively existed as follows in 1990 and in 2000. Oceania group did not have enough data to be ordered among these groups but it was put at the end of the list in both years. In 1990 from highest positive toward highest negative correlations, the South America group was the first, North America was the second, Africa was the third, Asia was the fourth, and Europe was the fifth group. In 2000, the order occurred as follows. From highest positive toward highest negative correlations, South America was the first again, Europe was the second, Asia was the third, North America was the fourth, and Africa was the fifth to have the highest associations among professional migration and cross-national inequality variables.

The correlations of professional migration with unemployment and population variables from the highest to the lowest in 1990 and 2000 occurred among six regions in the following order. Due to missing data, Oceania did not have enough data to be ordered in the list but it was listed as the last group in both years. In 1990 Asian group appeared to have the highest correlations of professional migration and unemployment and population variables, North America was the second, Europe was the third, Africa was the fourth, and South America was the fifth. In 2000, Asia was the first again, North America was the second, Africa was the third, Europe was the fourth, and South America was the fifth.

#### The Correlation Analyses Of The Migration Variables With Structural Variables For Three Groups Of World Countries Based Human Development Index

In this category world countries were divided into three groups as low human development countries, medium human development countries and high human development countries based on human development index category. Tables 43 through Table 45 illustrate the correlations of the migration variables with structural variables of these three human development groups in 1990 and 2000.

Table 43 shows the correlations of the three migration variables with cross-national interaction variables, cross-national inequality variables, and unemployment and population variables for low human development countries in 1990 and 2000. While professional migration had a strong positive association with U.S. import variable, it had very strong positive relationships with U.S. export, and the number of students in the U.S. variables. On the other hand, although nonprofessional migration seemed to have only a moderate positive relationship with U.S. export variable, total migration had a

Table 43: Low Human Development Countries Based on Human Development Index  
Correlations Among The Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.75***	.26*	.39**	.87***	.79***	.83***
U.S. Import	.56***	.21	.25*	.70***	.32*	.34*
U.S. Investment	.19	.02	.06	.44**	.17	.21
Foreign Investment in the U.S.	.06	-.02	.00	-.00	-.00	-.00
Number of Students in the U.S.	.94***	.21	.47***	.89***	.53***	.64***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.24	-.33**	-.33**	-.35*	-.26	-.32*
Difference in Per Capita Gross National Income	.06	-.14	-.12	-.01	-.03	-.04
Difference in Gross Enrollment Ratio	-.13	-.11	-.13	-.16	-.17	-.18
Difference in Expenditure for Research & Development	-.27	.08	-.13	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.91***	.10	.61**	-	-	-
Total Population	.93***	.16	.45***	.81***	.44**	.52***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

moderate positive association with U.S. export, U.S. import and number of students in the U.S. variables with statistical significances. The other correlations between three migration variables and cross-national interaction variables were either substantially or statistically important in 1990.

In 2000 while professional migration had a medium positive correlation with U.S. investment variable, it had very strong positive associations with U.S. export, U.S. import, and number of students in the U.S. variables. Although both nonprofessional migration and total migration had a very strong positive correlation with U.S. export, and a strong positive correlation with number of students in the U.S. they had a moderate positive association with U.S. import variable. The correlations of three migration variables with other cross-national interaction variables were either substantially or statistically insignificant in 2000..

Among the cross-national inequality variables, difference in expenditure for research and development in 2000 and difference in professional unemployment ratio in both years were excluded from the analyses due to exclusive missing data. Although professional migration was moderately negatively correlated with difference in life expectancy and difference in expenditure for research and development, it was weakly negatively correlated with difference in gross enrollment ratio with no statistical significances in 1990. Both nonprofessional migration and total migration had medium negative associations with difference in life expectancy variable with statistical significance at  $-0.33$ , they had a weak insignificant negative correlation with difference in per capita gross national income and difference in gross enrollment ratio for low human development countries.

In 2000 the correlations of professional migration and total migration with difference in life expectancy were  $-.35$ , and  $-.32$  respectively that indicated moderate negative associations with statically significances, but the correlations of nonprofessional with the same variable was  $-.26$ , without statistical significance. On the other hand, each of the three migration variables had a negligible negative association with difference in per capita gross national income, they had a weak negative correlation with difference in gross enrollment ratio but none of them were statistically significant for low human development group.

Among unemployment and population variable, only total unemployment in 1990 and total population migration variables in 1990 and 2000 had enough data to be used in correlation analyses for this study. In this sense, professional migration had very strong positive relationships with total unemployment and total population variables in 1990 because the correlations were  $.93$  and  $.93$  with high statistical significances. On the other hand, nonprofessional migration was weakly and positively associated with the same variables with no statistical significances. While total migration had a strong positive association with total unemployment variable, it had a moderate positive relationship with total population with statistical significances in 1990 for low human development group. In 2000, although professional migration was very strongly positively correlated with total population at  $.81$ , nonprofessional was moderately positively and total migration strongly positively associated with the same variable at  $.44$  and  $.52$  respectively in 2000 for low human development group.

Table 44 presents the correlations among the migration variables and structural variables of medium human development countries based on human development index category in 1990 and 2000. Professional migration had moderate positive relationships

Table 44: Medium Human Development Countries Based on Human Development Index  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.37**	.18	.31	.16	.71***	.92***
U.S. Import	.33*	.13	.24	.39***	.75***	.85***
U.S. Investment	.09	.03	.07	.13	.43***	.56***
Foreign Investment in the U.S.	-.04	-.06	-.05	.03	.52***	.71***
Number of Students in the U.S.	.45***	.20	.33*	.81***	.48***	.41***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.07	.06	.06	-.06	-.16	-.13
Difference in Per Capita Gross National Income	.16	.17	.21	.14	.10	.02
Difference in Gross Enrollment Ratio	-.07	.20	.11	-.07	-.09	-.08
Difference in Expenditure for Research & Development	-.04	-.56**	-.40	-.60***	-.20	-.17
Difference in Professional Unemployment Ratio	-.10	-.07	-.09	.04	.02	.03
<u>Unemployment and Population</u>						
Professional Unemployment	.08	-.09	-.07	.93***	.14	.15
Total Occupational Unemployment	.24	-.08	.02	.98***	.17	.17
Total Unemployment	.56**	.12	.32	.77***	.23	.23
Total Population	.35*	.15	.24	.84***	.44***	.35***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

with U.S. export, U.S. import and number of students in the U.S variables because correlations among them were .37, .33 and .45 respectively, but it was not associated substantially and statistically with U.S. investment and foreign investment in the U.S. variables in 1990. Although nonprofessional migration had a moderate positive but insignificant relationship with the number of students in the U.S., it appeared to have no substantially or statistically significant associations with the other three cross- national inequality variables. On the other hand, total migration was only moderately positively correlated with number of students in the U.S. because correlation was .33 with statistical significance whereas it was not associated substantially or statistically with the other four interaction variables for medium human development countries in 1990.

In 2000, although the correlations of professional migration with U.S. import was moderate positive, it had a very strong positive relationship with number of students in the U.S., however, professional migration did not have any substantially or statistically significant relationships with the other three cross national interaction variables. On the other hand, both nonprofessional migration and total migration variables had a strong positive association with U.S. export, U.S. import variables and a moderate positive relationship with number of students in the U.S. However, while nonprofessional migration was moderately positively associated with U.S. investment, total migration was strongly positively associated with the same variable. Although the association between nonprofessional and foreign investment in the U.S. variables was strong , the association between total migration and the same variable was very strong positive for medium human development countries in 2000.

Even though the associations of professional migration with difference in life expectancy and difference in per capita gross national income were either negligible or

weak positive, it had a negligible or weak negative relationship with difference in gross enrollment ratio, difference in expenditure for research and development, and difference in professional unemployment ratio variables without statistical significance in 1990. On the other hand, although nonprofessional migration had only a strong negative relationship with difference in expenditure for research and development with statistical significance because the correlation was  $-.56$  between them, total migration was moderately negatively associated with the same variable without statistical significance. However, other correlations among migration variables and cross-national inequality variables were not substantially or statistically significant for medium human development group in 1990.

In 2000, while professional migration had only a strong significant negative relationship with difference in expenditure for research and development because the correlation was  $-.60$ , nonprofessional migration was moderately negatively and total migration weakly negatively associated with the same variable. Professional migration and nonprofessional migration had a weak positive relationship with difference in per capita gross national income variable, nonprofessional and total migration variables had a negative association with difference in life expectancy variable with lack of statistical significances. Other correlations of migration variables with international interaction variables were neither substantially nor statistically important.

Although professional migration had a strong relationship with total unemployment and a moderate positive association with total population variables, its association with professional unemployment and total occupational unemployment were not substantially or statistically important. However, both nonprofessional migration and



total migration variables were either substantially or statistically not correlated with unemployment and population variables in 1990.

In 2000, the correlations of professional migration with all the four unemployment and population variables were very strong positive with statistical significances that were changed from .77 to .98. On the other hand, nonprofessional migration and total migration had a moderate positive and statistically significant relationship with only total migration. Although nonprofessional migration and total migration variables were substantially correlated with other unemployment and population variables, none of them were statistically significant for medium human development group in 2000.

Table 45 shows the correlations among the migration variables and structural variables of high human development countries based on human development index category in 1990 and 2000. In 1990 the correlations of professional migration with all cross national inequality variables were usually substantial and significant. Thus, professional migration had a strong positive correlation with U.S. export but it had moderate positive correlations with U.S. import, U.S. investment and number of students in the U.S. variables. On the other hand, although both nonprofessional migration and total migration had a moderate positive and statistically significant correlation with U.S. export at .24 and .26 respectively, they did not have any substantially or statistically significant relationships with the other four cross-national interaction variables in 1990.

During 2000, professional migration and total migration seemed to have higher correlations with cross-national interaction variables than during 1990. Although professional migration had very strong relationships with U.S. export, U.S. import and U.S. investment variables because all correlations were over .70, it had strong positive

Table 45: High Human Development Countries Based on Human Development Index  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.50***	.24*	.26*	.75***	.18	.65***
U.S. Import	.43***	.19	.22	.71***	.19	.64***
U.S. Investment	.33**	.06	.08	.71***	.17	.51***
Foreign Investment in the U.S.	.17	-.03	-.01	.61***	.16	.46***
Number of Students in the U.S.	.40***	.8	.12	.63***	.29*	.68***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.07	.17	.17	-.21	.10	-.08
Difference in Per Capita Gross National Income	.05	.12	.11	-.20	.15	-.02
Difference in Gross Enrollment Ratio	.00	.13	.12	-.31*	-.08	-.21
Difference in Expenditure for Research & Development	.00	.03	.02	-.21	-.01	-.18
Difference in Professional Unemployment Ratio	.06	.19	.18	-.20	-.02	-.18
<u>Unemployment and Population</u>						
Professional Unemployment	.30	.02	.03	.57***	.58***	.52***
Total Occupational Unemployment	.16	.04	.05	.50**	.56***	.52***
Total Unemployment	.16	.04	.05	.50***	.55***	.52***
Total Population	.37**	.22	.25*	.58***	.30*	.56***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

associations with foreign investment in the U.S. and number of students in the U.S. variables in that the correlations among them were .61 and .63. On the other hand, while nonprofessional migration had a medium positive and statistically significant association with number of students in the U.S. variable, it had no statistically insignificant relationship with other four cross-national inequality variables. However, while total migration had a medium significant positive association with foreign investment in the U.S. variable, it was strongly positively correlated with other four cross-national interaction variables because all correlations among these variables changed between .51 and .68 for high human development countries in 2000.

The correlations of professional migration with all cross-national inequality variables were substantially and statistically insignificant in 1990. On the other hand, although all associations of nonprofessional and total migration variables with all cross-national inequality variables were usually weak positive, none of those associations were statistically significant for this group in 1990.

In 2000, the correlations among professional migration and all five cross-national inequality variables were moderate negative changing from -.20 to -.31, but only the correlation between professional migration and difference in gross enrollment ratio was statistically significant. While nonprofessional migration had a weak positive relationship with difference in life expectancy and difference in per capita gross national income variables, total migration had a negative relationship with each of the cross-national inequality variables because correlations changed from -.2 to -.21 among them, but none of them were statically significant for high human development countries in 2000.

In 1990 while professional migration had a moderate positive association with professional unemployment and a weak positive relationship with total occupational

unemployment and total unemployment variables without statistical significances, it seemed to have a moderate positive and statistically significant correlation with total population at .37. On the other hand, although nonprofessional migration had a moderate positive but statistically insignificant relationship with total unemployment variable, and total migration had a moderate positive and statistically significant association with the same variable. However, both nonprofessional and total migration variables were not substantially and statistically associated with the other variables of this group.

In 2000 all migration variables were alike in having important correlations with each of the unemployment and population variables. Apart from the correlation between nonprofessional migration and total population, all the three migration variables were strongly positively associated with each of the four unemployment and population variables since all correlations among these variables were changed from .50 to .58 for high human development countries in 2000.

Summary: The correlations of professional migration variable with the variables of cross-national interaction, cross-national inequality and unemployment and population groups were usually higher than the correlations of nonprofessional migration and total migration variables with the same variables for three human development groups in 1990 and 2000.

In 1990, the order of the highest relationships of professional migration with cross-national interaction variables took place among the three groups as follows: The low human development group was the first, high human development group was the second, and medium human development group was the third to have the highest relationships of professional migration with cross-national interaction variables. In 2000,

high human development group was the first, low human development group was the second, and medium human development group was the third to have the highest correlations among the professional migration and cross-national interaction variables.

On the other hand, the order from the highest positive toward the highest negative relationships between professional migration and cross-national inequality variables for three human development groups is as follows. In 1990 high human development group was the first, medium human development group was second, and low human development group was third to have the highest correlations of professional migration with cross-national inequality variables. In 2000, the order for the same correlations was that medium human development group was first, low human development group was second, and high human development group was third to have the highest correlations between professional migration and cross-national interaction variables.

The list of the highest correlations of professional migration with unemployment and population variables occurs as follows; low human development group was first, medium human development group was second, and high human development group was third in 1990. In 2000, the order for the associations of professional migration with unemployment and population variables among these three groups was as following. Medium human development group was first, high human development group was the second, but low human development group was not ordered due to lack of data about these variables for this order.

### The Correlation Analyses Of The Migration Variables With Structural Variables For Three Groups Of World Countries Based On Income Aggregates

Table 46 through Table 48 illustrate the correlation analyses of migration variables with structural variables of low income group, medium income group, and high income group of the world countries based on income aggregates in 1990 and 2000.

Table 46 represents the correlations of the three migration variables with the variables of cross-national interaction, cross-national inequality, and unemployment and population groups for low income countries in both years. Although professional migration had very strong positive associations with U.S. export, U.S. import and number of students in the U.S. variables, it had a strong positive relationship with U.S. investment in 1990. On the other hand, nonprofessional migration was strongly positively correlated with U.S. export, U.S. import and number of students in the U.S. Total migration had a strong positive association with U.S. export and number of students in the U.S. variables, and a moderate positive relationship with U.S. export. However, none of the migration variables had a statistically significant correlation with foreign investment in the U.S. variable for low income countries in 1990.

In 2000, while professional migration had very strong relationships with U.S. export and number of students in the U.S because correlations among them were .84 and .95, it had a strong positive association with U.S. export; nonprofessional migration was moderately positively associated with U.S. export, U.S. import and number of students in the U.S. variables, total migration was moderately positively associated with U.S. import, and strongly positively related with U.S. export and number of students in the U.S. variables, but it was not correlated substantially or statistically with other two cross

Table 46: Low Income Countries Based on Income Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.91***	.58***	.59***	.84***	.40**	.67***
U.S. Import	.76***	.57***	.49***	.64***	.27*	.48***
U.S. Investment	.60***	.25	.38**	.16	.02	.09
Foreign Investment in the U.S.	.18	.12	.10	.04	-.01	.01
Number of Students in the U.S.	.96***	.57***	.63***	.95***	.36**	.69***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.44**	-.46**	-.46**	-.19	-.32*	-.32*
Difference in Per Capita Gross National Income	-.02	-.31*	-.33*	-.02	-.02	-.04
Difference in Gross Enrollment Ratio	-.31	-.32*	-.33*	-.11	-.23	-.22
Difference in Expenditure for Research & Development	-.48	-.27	-.44	-.64*	-.25	-.55
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.77**	.30	.71**	.98***	.78***	.91***
Total Population	.94***	.55***	.62***	.97***	.37**	.70***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

national interaction variables. However, none of the migration variables had a substantially or statistically correlation with U.S. investment and foreign investment variables for low income group countries in 2000.

Among the cross-national inequality variables difference in professional unemployment ratio variable did not have enough data so that it was excluded from this analysis in 1990 and 2000. Although professional migration had a moderate negative and statistically significant relationship with difference in life expectancy, it had moderate negative but statistically insignificant relationships with difference in gross enrollment ratio and difference in expenditure for research and development variables in 1990. On the other hand, both nonprofessional migration and total migration variables had moderate negative associations with all the four cross-national interaction variables, but their moderate negative associations with difference in expenditure for research and development variable were not statistically significant for low income group in 1990.

In 2000, whereas the associations of professional migration with difference in life expectancy and difference in gross enrollment ratio were weak negative and statistically insignificant, professional migration had only a strong negative and statistically significant relationship with difference in gross enrollment ratio variable because the correlation was  $-.64$  between them. On the other hand, nonprofessional migration and total migration were similar to each other in that both had a moderate negative and statistically significant relationship with difference life expectancy, but they had a moderate negative and statistically insignificant association with difference in gross enrollment ratio. However, while nonprofessional migration had a moderate negative and total migration variable had a strong negative association with difference in expenditure



for research and development, these relationships were not statistically significant for the low income group countries.

Among unemployment and population variables, professional unemployment and total occupational unemployment did not have enough data in 1990 and 2000, so that they were excluded from the analyses. Thus, in 1990, professional migration had very strong positive relationships with total occupation and total population variables because the correlations among them were .77 and .94 respectively. On the other hand, while nonprofessional migration had a strong significant positive relationship with total population, it had a moderate positive but insignificant association with total occupation. Therefore, total migration had a strong positive correlation with total unemployment and a very strong positive association with total population with statistical significances for low income countries.

In 2000 both professional migration and total migration variables were very strongly positively correlated with total unemployment and total population variables with statistical significances. On the other hand, while nonprofessional had a very strong positive relationship with total unemployment variable, it had a moderate positive association with total population with statistical significances for low income group countries.

Table 47 shows the correlations of migration variables with structural variables of medium income countries based on income aggregates in 1990 and 2000. Although professional migration was very strongly positively correlated with U.S export variable, and strongly positively associated with U.S. import and U.S. investment variables, it had a moderate positive correlation with number of students in the U.S. in 1990. On the other hand, while both nonprofessional migration and total migration

Table 47: Medium Income Countries Based on Income Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.72***	.85***	.87***	.23*	.79***	.93***
U.S. Import	.67***	.78***	.80***	.52***	.83***	.87***
U.S. Investment	.57***	.68***	.69***	.20*	.48***	.57***
Foreign Investment in the U.S.	.06	.11	.11	.08	.53***	.68***
Number of Students in the U.S.	.39***	.19	.23*	.67***	.47***	.36***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.05	-.05	-.06	-.07	-.12	-.09
Difference in Per Capita Gross National Income	.03	-.01	-.01	.16	.12	.04
Difference in Gross Enrollment Ratio	-.08	.01	.00	-.17	-.06	-.05
Difference in Expenditure for Research & Development	.09	.08	.09	-.29	-.07	-.04
Difference in Professional Unemployment Ratio	-.10	-.08	-.08	.16	.03	.07
<u>Unemployment and Population</u>						
Professional Unemployment	.15	.03	.02	.54**	.04	.06
Total Occupational Unemployment	.11	.06	.05	.65***	.08	.07
Total Unemployment	.26*	.05	.07	.56***	.27*	.19
Total Population	.33***	.19	.21*	.75***	.48***	.31**

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

variables had a very strong positive association with U.S. export, and U.S. import variables, they had a strong positive relationship with U.S. investment variable. While nonprofessional migration had a weak positive but insignificant relationship with number of students in the U.S. variable, total migration had a moderate positive and statistically significant association with the same variable. However, each of the three migration variables did not have any substantially and statistically significant relationship with foreign investment in the U.S variable for medium income countries in 1990.

In 2000, while professional migration variable had a positive moderate association with U.S. export and U.S. investment variables, it had a strong positive relationship with U.S export and number of students in the U.S. variables. On the other hand, both nonprofessional migration and total migration variables were very strongly positively associated with U.S. export and U.S. import variables and strongly positively correlated with foreign investment in the U.S., but both migration variables were moderately positively related with number of students in the U.S. However, whereas nonprofessional migration had a moderate positive relationship with U.S. investment, total migration had a strong positive association with the same variable for medium income countries.

There were no statistically significant correlations among the three migration variables and the five cross-national interaction variables in both years. During 1990 only professional migration had a weak negative relationship with difference in professional unemployment ratio because the correlation was  $-.10$ . However, the other correlations of the three migration variables with the five cross-national interaction variables were neither substantially nor statistically significant for medium income countries.

During 2000, while professional migration had a weak positive relationship with difference in per capita gross national income and difference in professional unemployment variables, it had a weak negative association with difference in gross enrollment ratio and a moderate negative correlation with difference in expenditure for research and development variable. Although nonprofessional migration was weakly negatively correlated with difference in life expectancy, it was weakly positively associated with difference in per capita gross national income. However, the other correlations of both nonprofessional migration and total migration with all the cross-national inequality variables for medium income countries were neither substantially nor statistically important in 2000.

In 1990, professional migration had only a medium positive and statistically significant relationship with total unemployment and total population variables among the four unemployment and population variables. While nonprofessional migration had a weak positive relationship with total population it was either substantially or statistically not correlated with unemployment and population variables. Although total migration only had a weak positive and statistically significant relationship with total population, it had no substantially and statistically significant correlations with the other variables of this group for medium income countries in 1990.

In 2000 although professional migration had a strong positive association with professional unemployment, total occupational unemployment, and total unemployment variables, it had a very strong positive correlation with total population. On the other hand, nonprofessional migration was only moderately positively associated with total unemployment and total population variables, but it was not associated with the other variables of this group. However, although total migration had a moderate positive and

statistically significant correlation with total population with, it was not substantially or statistically correlated with the other variables of unemployment and population group for medium income countries in 2000.

In sum: The relationships of professional migration with cross-national interaction variables relatively decreased, the relationships of nonprofessional and total migration variables with the same variables increased from 1990 to 2000. During 1990 all the correlation of migration variables with cross-national inequality variables usually seemed to be negligible and negative, during 2000 the magnitudes of these relationships increased in negative ways in general. On the other hand, the associations of three migration variables with unemployment and population variables significantly increased from 1990 to 2000 for medium income countries group.

Table 48 illustrates the correlations of migration variables with structural variables of high income countries group based on income aggregates in 1990 and 2000. Although professional migration had a moderate positive association with only foreign investment in the U.S., it had strong positive associations with all other four cross-national interaction variables because the correlations among them changed from .58 to .68 for high income countries in 1990. On the other hand, nonprofessional migration variable appeared to have a strong positive relationship with U.S. export, U.S. import and U.S. investment variables, but it had a moderate positive association with foreign investment in the U.S. and number of students in the U.S. variables. Similar to nonprofessional migration, total migration had a strong positive correlation with U.S. export and U.S. import and a moderate association with foreign investment in the U.S. variable, but it had a very strong positive relationship with U.S. investment and number of students in the U.S. variables for high income countries in 1990.

Table 48: High Income Countries Based on Income Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.65***	.59***	.67***	.77***	.20	.74***
U.S. Import	.58***	.52***	.62***	.73***	.20	.73***
U.S. Investment	.68***	.66***	.70***	.75***	.22	.64***
Foreign Investment in the U.S.	.45**	.44**	.49**	.66***	.22	.59***
Number of Students in the U.S.	.68***	.48**	.70***	.60***	.21	.61***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.27	-.23	-.27	-.21	.13	-.08
Difference in Per Capita Gross National Income	-.09	-.00	-.08	-.21	.16	-.06
Difference in Gross Enrollment Ratio	-.32	-.27	-.28	-.27	-.14	-.21
Difference in Expenditure for Research & Development	-.21	-.13	-.25	-.08	-.03	-.11
Difference in Professional Unemployment Ratio	-.01	-.10	-.06	.10	.12	.04
<u>Unemployment and Population</u>						
Professional Unemployment	.73***	.62**	.74***	.54**	.76***	.55**
Total Occupational Unemployment	.41*	.40	.49*	.46*	.57**	.52**
Total Unemployment	.38*	.37*	.45**	.48**	.61***	.53***
Total Population	.39*	.37*	.47**	.54***	.24	.54***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

In 2000, professional migration and total migration are alike in that both variables were very strongly positively associated with U.S. export, U.S. import, and strongly positively associated with foreign investment in the U.S. investment and number of students in the U.S. variables. On the other hand, nonprofessional migration had a moderate positive association with each of the cross-national interaction variables but none of them were statistically significant in 2000 for high income group countries.

During 1990 and 2000, none of the correlations of the migration variables with all cross-national inequality variables were statistically significant for high income group countries. In 1990, however, while all the three migration variables had moderate negative correlations with difference in life expectancy, difference in gross enrollment ratio, and difference in expenditure for research and development variables, they had no significant association with other two cross-national interaction variables for high income group countries.

In 2000 although the correlations of professional migration with difference in life expectancy, difference in per capita gross national income, and difference in gross enrollment ratio variables were moderate negative, it had a weak positive association with difference in professional unemployment ratio. While nonprofessional migration was weakly negatively correlated with difference in gross enrollment ratio, , it had weak positive relations with the other three cross-national inequality variables. On the other hand, total migration appeared to have a moderate negative association with difference in gross enrolment ratio, but a weak negative relationship with difference in expenditure for research and development variable for the same group countries.

Although professional migration had a very strong positive association with professional unemployment variables, it had moderate positive associations with the

other three unemployment and population variables in 1990. While nonprofessional migration had a strong positive relationship with professional unemployment, it had moderate positive relationships with total unemployment and total population. On the other hand, total migration was strongly positively correlated with professional migration whereas it had a moderate relationship with the other three variables for high income level countries in 1990.

Although professional migration was strongly positively correlated with professional unemployment and total population variables, it was moderately positively related with total occupational unemployment and total unemployment variables in 2000. On the other hand, nonprofessional migration had a very strong positive relationship with professional unemployment, and strong associations with total occupational unemployment and total unemployment variables, but it did not have a statistically significant relationship with total population. Total migration seemed to have a strong positive relationship with each of four unemployment and population variables in 2000 for high income level countries in this research.

Summary: Correlation analyses of migration variables with the variables of cross-national interaction, cross-national inequality and unemployment and population groups for the three income groups of world countries showed some common patterns in both years. Although sometimes the correlations of nonprofessional and total migration with three groups of structural variables were higher than the correlations of professional migration with the same group variables, relatively professional migration variable had higher associations with those three groups of cross-national interaction, cross-national inequality, and unemployment and population variables. In this sense, in 1990 the highest



correlations between the professional migration and cross-national inequality variables took place among the low income group countries, the second highest correlations existed among the high income countries, and the third highest correlation occurred among the medium income group countries. In 2000, the order was that high income group was the first, low income group was the second, and medium income group was the last to have the highest correlations of professional migration with cross-national interaction variables.

On the other hand, the order from the highest positive toward highest negative associations of professional migration with cross-national inequality variables in 1990 and 2000 occurred in the following order. Medium income group was the first, high income group was the second, and low income group was the third to have the highest associations with cross-national inequality variables in 1990. In 2000, medium income group was the first, high income group was the second, and low income group was the last to have the highest positive toward the highest negative correlations of professional migration with the same cross-national inequality variables.

The order for the levels of associations of professional migration with the unemployment and population group variables in 1990 was that low income group was the first, high income group was the second, and medium income group was the third. In 2000, the order for the levels of correlations among the same variables was that low income group was the first, medium income group was the second, and high income group was the third.

### The Correlation Analyses Of The Migration Variables With Structural Variables For Four Groups Of World Countries Based On Development Level Categories

Tables 49 through Table 52 illustrate the correlation analyses of the three migration variables with the variables of cross-national interaction, cross-national national inequality, and unemployment and population groups for four groups of the world countries as developed countries, developing countries, industrialized countries, and Eastern Europe and former Union of Soviet Socialist Republic (U.S.S.R.) countries based on developmental level category in 1990 and 2000.

Table 49 represents the correlations of migration variables with structural variables of cross-national interaction, cross-national national inequality, and unemployment and population groups for least developed countries in 1990 and 2000. In 1990, professional migration appeared to have a very strong positive association with U.S. export and number of students in the U.S., and a strong positive relationship with U.S. export variable. Nonprofessional migration seemed to have a very strong association with U.S. export but a moderate relationship with U.S. import and number of students in the U.S. variables. On the other hand, total migration seemed to have a very strong association with U.S. export, a moderate positive relationship with U.S. import, and a strong positive correlation with number of students in the U.S. with statistical significances. However, none of the migration variables was either substantially or statistically correlated with U.S. investment and foreign investment in the U.S. variables for least developed countries in 1990.

In 2000 the levels of correlations of three migration variables with cross-national interaction variables were weaker than in 1990. Professional migration was very strongly

Table 49: Least Developed Countries Based on Developmental Level  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.81***	.89***	.78***	.80***	.87***	.88***
U.S. Import	.60***	.50***	.43**	.30*	.18	.18
U.S. Investment	.25	.17	.13	.00	.00	.02
Foreign Investment in the U.S.	.17	.06	.03	.05	.01	.02
Number of Students in the U.S.	.89***	.58***	.55***	.68***	.45**	.43**
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.04	-.02	.00	-.04	-.04	-.05
Difference in Per Capita Gross National Income	.17	.07	.07	-.02	.01	-.00
Difference in Gross Enrollment Ratio	.06	-.10	-.15	-.02	-.04	-.06
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.79*	.44	.63	.89***	.82**	.85***
Total Population	.63***	.15	.16	.56***	.29*	.27

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

positively correlated with U.S. export, and strongly positively correlated with number of students in the U.S., but moderately positively connected with U.S. import. On the other hand, while both nonprofessional and total migration were very strongly positively associated with U.S. export, they were moderately positively correlated with the number of students in the U.S. in 1990. However, other correlations of the three migration variables with cross-national interaction variables were not either substantially or statistically significant in 2000.

As cross-national inequality variables, differences in expenditure for research and development and difference in professional unemployment variables did not have enough data, so that they were excluded from the correlation analysis for this study in both years. There were no substantially statistically significant correlations among the three migration variables and cross national inequality variables in 1990 and 2000. However, professional migration had a weak positive association with difference in per capita gross national income, both nonprofessional and total migration had a weak negative relationship with difference in gross enrollment ratio in 1990. However, all correlations of three migration variables with all three cross-national interaction variables were neither substantially nor statistically important for least developed countries in 2000.

On the other hand, due to lack of data only two unemployment and population variables were included in the correlation analyses in both the years. In this base, professional migration had a very strong correlation with total unemployment and a strong positive relationship with total population in 1990. While nonprofessional migration had a moderate positive association with total unemployment, it had a weak positive relationship with total population because correlations among them were .44 and

.16 respectively but no statistical significances. Total migration was strongly positively associated with total unemployment and weakly positively related with total population at .63 and .16 without statistical significances in 1990.

In 2000 all the three migration variables had a very strong positive relationship with total unemployment variable. Although professional migration had a strong positive and nonprofessional had a moderate positive relationship with total population, total migration had a statistically insignificant correlation with total migration variable for least developed countries.

Table 50 shows the correlations of migration variables with variables of cross-national interaction, cross-national inequality, and unemployment and population groups for the developing countries in 1990 and 2000. Apart from foreign investment in the U.S., professional migration had a strong association with U.S. export and U.S. import variables, but a moderate association with U.S. investment and number of students in the U.S. in 1990. On the other hand, nonprofessional and total migration were alike in that both had a very strong correlation with U.S. export, and a strong positive association with U.S. import and U.S. investment variables, but they were not associated either substantially or statistically with other foreign investment in the U.S. and number of students in the U.S. variables in 1990.

In 2000, professional migration appeared to have a moderate positive association with U.S. import and a very strong relationship with number of students in the U.S., but it was not correlated either substantially or statistically with other cross-national interaction variables. On the other hand, while nonprofessional migration was very strongly positively correlated with U.S. export and U.S. import, it was moderately positively associated with other three variables of this group. Total migration had a very strong

Table 50: Developing Countries Based on Developmental Level  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.68***	.81***	.83***	.18	.70***	.90***
U.S. Import	.63***	.67***	.69***	.41***	.74***	.84***
U.S. Investment	.46***	.59***	.59***	.14	.38***	.50***
Foreign Investment in the U.S.	-.03	.01	.00	.05	.48***	.67***
Number of Students in the U.S.	.44***	.10	.14	.75***	.43***	.38***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.05	-.07	-.07	.01	-.09	-.08
Difference in Per Capita Gross National Income	.12	.04	.05	.16	.19	.11
Difference in Gross Enrollment Ratio	-.10	-.03	-.04	-.01	-.03	-.04
Difference in Expenditure for Research & Development	-.08	.02	.00	-.47**	-.16	-.15
Difference in Professional Unemployment Ratio	-.09	-.05	-.06	-.01	.04	.07
<u>Unemployment and Population</u>						
Professional Unemployment	.29	-.03	.00	.97***	.19	.19
Total Occupational Unemployment	.30	-.02	.01	.98***	.19	.19
Total Unemployment	.27	-.01	.02	.77***	.22	.22
Total Population	.36***	.05	.08	.84***	.44***	.35***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

positive association with U.S. export and U.S. import variables, and a strong positive correlation with U.S investment and foreign investment in the U.S., but it had a moderate relationship with number of students in the U.S. for developing countries.

Although the correlation between professional migration and difference in per capita gross national income was weak positive at .12, the correlation between professional migration and difference in gross enrollment ratio was weak negative at -.10 without statistical significances. However, the other relationships of the three migration variables with five cross-national inequality variables were neither substantially nor statistically important for developing countries in 1990.

During 2000 only professional migration had a moderate negative and statistically significant association with difference in expenditure for research and development variable because the correlation was -.47 between them. Even though nonprofessional and total migration had a weak negative association with difference in expenditure for research and development and the three migration variables had a weak positive correlation with difference in per capita gross national income, none of these correlations were either substantially or statistically important in 2000 for developing countries.

In 1990 while professional migration had a moderate positive association with each of four unemployment and population variables, it was only statistically significantly correlated with total population at .36. On the other hand, nonprofessional migration and total migration were neither substantially nor statistically associated with any variable of unemployment and population variables for developing countries in 1990.

In 2000 professional migration was very strongly positively associated with all unemployment and population variables with statistical significances. On the other hand,

both nonprofessional migration and total migration had a moderate positive and statistically significant association with only total population, but they did not have any significant relationship with other variables of unemployment and population group for developing countries in 2000.

Table 51 illustrates the correlations of migration variables with the variables of cross-national interaction, cross-national inequality, and unemployment and population groups for industrialized countries in 1990 and 2000. Although professional migration had a moderate positive relationship with foreign investment in the U.S., it had a strong association with each of other four variables of cross-national interaction variables in 1990. On the other hand, nonprofessional and total migration are similar to each other in that both have a strong association with U.S. export and U.S. import and a moderate relationship with foreign investment in the U.S. variables. However, while nonprofessional migration had a strong positive relationship with U.S. investment and a moderate relationship with number of students in the U.S., total migration appeared to have a very strong correlation with U.S. investment and a strong association with number of students in the U.S. variable for industrialized countries in 1990.

In 2000, professional migration and total migration were alike in that both professional and total migration variables were very strongly positively correlated with U.S. export, U.S. import, and U.S. investment variables, but they were strongly positively associated with foreign investment in the U.S. and number of students in the U.S. variables. On the other hand, nonprofessional migration had a strong positive correlation with each of the five cross-national interaction variables for industrialized countries in 2000.



Table 51: Industrialized Countries Based on Developmental Level  
Correlations Among The Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.65***	.57***	.67***	.76***	.51**	.83***
U.S. Import	.58***	.50**	.62***	.72***	.54**	.82***
U.S. Investment	.68***	.64***	.70***	.75***	.61***	.72***
Foreign Investment in the U.S.	.45*	.42*	.48**	.66***	.63***	.68***
Number of Students in the U.S.	.67***	.43*	.69***	.59***	.53**	.68***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.05	.12	-.02	-.07	-.01	-.12
Difference in Per Capita Gross National Income	-.04	.11	-.00	-.13	-.14	-.13
Difference in Gross Enrollment Ratio	-.35	-.22	-.27	-.26	-.22	-.19
Difference in Expenditure for Research & Development	-.10	.08	-.09	-.05	-.05	-.07
Difference in Professional Unemployment Ratio	.07	-.11	-.02	.08	.13	.01
<u>Unemployment and Population</u>						
Professional Unemployment	.77***	.61**	.78***	.54*	.83***	.55*
Total Occupational Unemployment	.41	.37	.49*	.45*	.63**	.52*
Total Unemployment	.39*	.36	.47*	.47*	.66***	.53**
Total Population	.38*	.35	.47**	.53**	.66***	.61***

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

Although none of the correlations of the three migration variables with all cross-national inequality variables were statistically insignificant, relatively there were some substantial associations among those variables in both years. Even though professional migration had a moderate negative association with difference in gross enrolment ratio it was weakly negatively correlated with difference in expenditure for research and development variable in 1990. On the other hand, while nonprofessional migration had a weak positive association with difference in life expectancy and difference in per capita gross national income variables, it had a moderate negative association with difference in gross enrollment ratio and a weak negative relationship with difference in professional unemployment ratio variables. Although total migration was moderately negatively associated with difference in gross enrollment ratio it was not substantially and statistically associated with the other cross-national inequality variables in 1990.

In 2000 both professional migration and nonprofessional migration variables had a weak negative association with difference in per capita in gross national income and a moderate negative relation with difference in gross enrollment ratio variable. On the other hand, total migration was weakly negatively correlated with difference in life expectancy, difference in per capita gross national income and difference in gross enrollment ratio variables for industrialized countries group.

Although professional migration had a very strong positive association with professional unemployment, it had a moderate positive relationship with total unemployment and total population variables, but it did not have a statistically significant correlation with total occupational unemployment in 1990. On the other hand, while nonprofessional migration was strongly positively associated with professional unemployment, it did not appear to have a statistically significant correlation with other

three unemployment and population variables. However, although total migration had a very strong positive association with professional unemployment, it was moderately positively correlated other three variables of this group in 1990 for industrialized countries.

In 2000, while professional migration was strongly positively correlated with professional unemployment and total population variables, it was moderately positively related to total occupational unemployment and total unemployment. Although nonprofessional migration had a very strong positive association with professional unemployment, it had a strong positive correlation with each of other three variables in this group. On the other hand, total migration was strongly positively correlated with all the unemployment and population variables for industrialized countries.

Table 52 exhibits the correlations of migration variables with the structural variables for Eastern Europe and former Union of Soviet Socialist Republics (U.S.S.R.) countries in 1990 and 2000. In 1990 all the three migration variables did not have any substantially and statistically significant relationship with U.S. investment and foreign investment in the U.S. Although professional migration had a strong positive association with U.S. export and U.S. import variables, it had a very strong positive relationship with number of students in the U.S. While nonprofessional migration was moderately positively associated with U.S. export and strongly associated with U.S. import, it was very strongly positively correlated with number of students in the U.S. On the other hand, total migration had a very strong positive association with U.S. export and U.S. import while it had a strong positive relationship with number of students in the U.S. in 1990.

In 2000, professional migration variable seemed to have a strong positive association with U.S. export and U.S. import whereas it had a very strong positive

Table 52: Eastern Europe & Former U.S.S.R. Countries Based on Developmental Level  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.57***	.38*	.79***	.59***	.22	.58***
U.S. Import	.68***	.53**	.79***	.57**	.18	.58***
U.S. Investment	-.05	-.04	-.04	.14	.07	.11
Foreign Investment in the U.S.	.08	.11	.01	-.05	-.09	-.07
Number of Students in the U.S.	.73***	.75***	.53**	.84***	.42*	.74***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.15	-.17	-.07	.19	-.08	.17
Difference in Per Capita Gross National Income	.18	.19	.16	.17	.18	.21
Difference in Gross Enrollment Ratio	.07	.03	.24	-.08	-.07	-.10
Difference in Expenditure for Research & Development	-.28	-.28	-.25	-.05	-.04	-.13
Difference in Professional Unemployment Ratio	-	-	-	.33	.27	.47
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	.70**	.47	.81***
Total Occupational Unemployment	.39	.39	.36	.75**	.54*	.84***
Total Unemployment	.19	.19	.16	.77***	.59**	.85***
Total Population	.57***	.38*	.77***	.76***	.34	.76***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

correlation with number of students in the U.S. On the other hand, nonprofessional migration appeared to have only a moderate positive and statistically significant relationship with number of students in the U.S. among all five cross-national interaction variables. Although total migration was strongly positively associated with U.S. export and U.S. import variables, it was very strongly correlated with number of students in the U.S. for Eastern Europe and former U.S.S.R. countries.

Since there were no statistically significant correlations among migration variables and cross-national inequality variables, some correlations appeared substantially important in 1990 and 2000. In this base, professional migration and nonprofessional migration were alike because both had a weak negative relationship with difference in life expectancy and a moderate negative association with difference in expenditure for research and development, but they had a weak positive relationship with difference in per capita gross national income in 1990. On the other hand, while total migration was weakly positively correlated with difference in per capita gross national income and moderately positively associated with difference in gross enrollment ratio variables, it was moderately negatively related with difference in expenditure for research and development in 1990. Difference in professional unemployment variable was not included in the 1990 analysis due to missing data.

In 2000 since professional migration had a weak positive association with difference in life expectancy and difference in per capita gross national income, it had a moderate positive relationship with difference in professional unemployment ratio variable. Nonprofessional migration was weakly positively correlated with difference in per capita gross national income and moderately positively associated with difference in professional unemployment ratio. On the other hand, total migration had a weak positive

association with difference in life expectancy and moderate positive associations with difference in per capita gross national income and difference in professional unemployment ratio variables in 2000 for Eastern Europe and former U.S.R.R. countries.

In 1990 professional unemployment variable was excluded from correlation analysis due to missing data. Although professional migration had no statistically significant association with total occupational unemployment and total unemployment variables, it had a strong positive and statistically significant association with total population. Since nonprofessional migration was only moderately positively correlated with total population with statistical significance, it did not have statistically significant associations with the other two variables of this group. Like nonprofessional migration, total migration did not have either substantially or statistically important relationship with total occupational unemployment and total unemployment, but it was very strongly positively associated with total population in 1990.

In 2000, both professional migration and total migration appeared to have a very strong relationship with each of the unemployment and population variables. While nonprofessional migration had a strong relationship with only total occupational unemployment and total unemployment variables, it was not associated with professional unemployment and total population variables with statistical significances. for Eastern Europe and former U.S.S.R. countries based on development level.

Summary: The correlation analyses of the three migration variables with all three groups of structural variables for all the world countries based on four development level groups indicated that professional migration variable had a relatively stronger association with cross national interaction, cross-national inequality, and unemployment and population group variables than the associations of the other two nonprofessional and

total migration variables with the same group variables in 1990 and 2000. Consequently, it was possible to classify each of the four development groups based on how strongly professional migration was associated with cross-national interaction variables, cross-national inequality variables and unemployment and population variables in 1990 and 2000.

In 1990 the highest level of associations between professional migration and cross-national interaction variables existed among industrialized countries, the second highest level occurred among the least developed countries, the third highest level took place among the developing countries and the fourth highest level of association happened among Eastern Europe and former U.S.S.R. countries. In 2000, the order was that industrialized countries group was first again, Eastern Europe and former U.S.S.R. countries group was second, the least developed countries group was third, and the developing countries group was the last to have the highest relationships of professional migration with cross-national interaction variables.

From the highest positive toward the highest negative the levels of associations of professional migration with cross-national inequality variables occurred in following order in both years. In 1990, the least developed group was the first, developing countries group was second, Eastern Europe and former U.S.S.R group developing countries group was third, and industrialized countries group was last .In 2000 the order for the same associations among the four groups existed as follows. Eastern Europe and former U.S.S.R. group was first, least developed countries group was the second, developing countries group was the third, and industrial countries group was the fourth.

On the other hand, the levels of relationships of professional migration with unemployment and population variables took place among these four groups in the

following order. In 1990, least developed countries group was first, industrialized countries group was second, Eastern Europe and former U.S.S.R. countries group was third, and developing countries group was fourth. In 2000, the order was that developing countries group was first, Eastern Europe and former U.S.S.R. group was second, least developed countries group was third, and industrialized countries group was the fourth to have the highest correlations between the professional migration and unemployment and population variables.

#### The Correlation Analyses Of The Migration Variables With Structural Variables For Seven Groups Of World Countries Based On Regional And Industrial Aggregates

In order to analyze the correlations of the three migration variables with the variables of cross-national interaction, cross-national national inequality and unemployment and population groups, the world countries were divided into seven groups as Sub-Saharan Africa, Arab states, Latin America and Caribbean, Asian and Pacific, OECD countries, Eastern Europe and former U.S.S.R. countries, and other based on regional and industrial aggregates in 1990 and 2000. Tables 53 through Table 59 demonstrate the correlations of the migration variables with structural variables for each of these seven groups.

Table 53 shows the correlations of the three migration variables with cross-national interaction, cross-national inequality, and unemployment and population variables for Sub-Saharan African countries in 1990 and 2000. While professional migration had a strong positive association with U.S. export, and very strong positive relationship with U.S. import and number of students in the U.S., it did not have any significant association with other U.S. investment and foreign investment in the U.S.



Table 53: Sub-Saharan African Countries Based on Regional & Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.55***	.29*	.41**	.56***	.23	.41**
U.S. Import	.85***	.74***	.75***	.86***	.56***	.69***
U.S. Investment	-.09	-.27	-.17	.58***	.25	.42**
Foreign Investment in the U.S.	.06	.09	.11	.25	.09	.22
Number of Students in the U.S.	.94***	.83***	.89***	.70***	.63***	.68***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.05	.02	-.01	-.06	-.05	-.05
Difference in Per Capita Gross National Income	.06	.13	.11	.02	.11	.06
Difference in Gross Enrollment Ratio	-.18	-.05	-.09	-.11	.11	.05
Difference in Expenditure for Research & Development	.00	.19	.10	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.21	.05	.10	.58*	-.01	.22
Total Population	.87***	.77	.82***	.82***	.70***	.79***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

variables in 1990. On the other hand, nonprofessional migration and total migration variables were alike in that both had a moderate relationship with U.S. export, and a very strong positive association with U.S. import and number of students in the U.S. variables, but did not have either substantially or statistically significant relationships with U.S. investment and foreign investment in the U.S. variables in 1990 for Sub-Saharan Africa.

In 2000, professional migration was strongly positively associated with U.S. export and U.S. investment, but it was very strongly positively related with U.S. import and number of students in the U.S. variables. Although nonprofessional migration had a strong relationship with U.S. import and number of students in the U.S. variables, it did not have any statistically significant association with the other three cross-national interaction variables. While total migration appeared to have a moderate positive association with U.S. export and U.S. investment variables, it had a strong relationship with U.S. import and the number of students in the U.S. variables, but it did not have a statistically significant association with foreign investment in the U.S. for Sub-Saharan Africa.

Among the cross-national inequality variables difference in expenditure for research and development in 2000 and difference in professional unemployment ratio in both years were not included in the correlation analyses due to missing data. However, neither in 1990 nor in 2000 the correlations of the three migration variables with cross-national inequality variables were not statistically significant. However, there were some substantially weak relationships among them. Thus, while professional migration had a weak negative association with difference in gross enrollment ratio, nonprofessional migration had a weak positive association with difference in per capita gross national income and a moderate positive relationship with difference in expenditure for research

and development. However, total migration was weakly positively associated with difference in per capita gross national income and difference in expenditure for research and development variables in 1990.

In 2000, although professional migration had a weak negative association with difference in gross enrollment ratio, nonprofessional migration had a weak positive relationship with difference in per capita gross national income and difference in gross enrollment ratio variables. None of the other correlations of migration variables with cross-national inequality variables were substantially and statistically significant for Sub-Saharan African countries.

Among the unemployment and population variables only total unemployment and total population had enough data for correlation analyses in both years. Although professional migration had a moderate insignificant positive relationship with total unemployment, it had a very strong positive association with total population in 1990. While nonprofessional migration had a negligible positive correlation with total unemployment and a very strong association with total population, none of them were statistically significant. On the other hand, whereas total migration had a weak positive insignificant association with total unemployment, it had a very strong correlation with total population in 1990 for Sub-Saharan Africa.

In 2000, professional migration was strongly positively correlated with total unemployment while it was very strongly positively associated with total population. On the other hand, Even though both nonprofessional and total migration had a very strong positive relationship with total population, they did not have a statistically significant association with total unemployment for Sub-Saharan countries.

Table 54 represents the correlations of three migration variables with the variables of cross-national interaction, cross national inequality, and unemployment and population groups for Arab states based on regional and industrial aggregates in 1990 and 2000. Although professional migration had a weak positive association with U.S. export and U.S. investment variables, it had a weak negative relationship with U.S. import and moderate negative association with foreign investment in the U.S. But it was only strongly positively associated with number of students in the U.S with statistical significance. While nonprofessional migration had some substantial relationship with all five cross-national interaction variables none of them were statistically significant in 1990. On the other hand, while total migration was strongly positively correlated with number of students in the U.S. with statistical significance, it was not associated with other variables of this group either substantially or statistically in 1990. In 2000, although professional migration had a moderate positive association with U.S. export and number of students in the U.S., both nonprofessional and total migration had a moderate positive association with number of students in the U.S. and a weak negative association with foreign investment in the U.S. variables. However, none of the correlations of migration variables with cross-national interaction variables were statistically significant for Arab states.

Among the cross-national inequality variables, difference in expenditure for research and development and difference in professional unemployment ratio variables were excluded from the correlation analyses due to insufficient data in 1990 and 2000. Although professional migration had a moderate positive association with difference in gross national income at .45 and a moderate negative association with difference in gross enrolment ratio at -.22, none of its correlation with cross national inequality variables

Table 54: Arab Countries Based on Regional & Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.10	-.08	-.01	.21	-.10	.04
U.S. Import	-.17	-.22	-.17	-.10	.05	.08
U.S. Investment	.17	.00	.05	.15	-.16	-.05
Foreign Investment in the U.S.	-.22	-.26	-.19	-.07	-.15	-.13
Number of Students in the U.S.	.52*	.41	.67**	.27	.20	.39
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.04	.39	.10	-.03	.15	.06
Difference in Per Capita Gross National Income	.45	.54*	.48*	.39	.49*	.49*
Difference in Gross Enrollment Ratio	-.22	.00	-.14	-.07	.19	.11
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	-	-	-	-	-	-
Total Population	.46	.29	.24	.76***	.52*	.55*

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

were statistically significant in 1990. On the other hand, while nonprofessional migration had a moderate insignificant positive association with difference in life expectancy, it had only a strong positive and statistically significant correlation with difference in per capita gross national income variable. Total migration seemed to have a moderate positive and statistically significant relationship with only difference in per capita gross national income variable among all the three cross national inequality variables for Arab states in 1990.

In 2000, while professional migration had a moderate positive association with difference in per capita gross national income, none of its associations with cross-national inequality variables were statistically significant. On the other hand, both nonprofessional and total migration had a weak positive insignificant association with difference in gross enrollment ratio variable, but they were moderately positively correlated with difference in per capita gross national income with statistical significances for Arab states in 2000.

Among the unemployment and population variables, only total population had enough data for correlation analyses in both years. In this base, each of three migration variables had a moderate positive relationship with total population, but none of them were statistically significant in 1990. On the other hand, while professional migration had a very strong positive association with total population, both non professional and total migration variables were strongly positively associated with total population for Arab states in 2000.

Table 55 shows the correlations of three migration variables with cross-national interaction, cross-national inequality, and unemployment and population variables for Latin America and Caribbean countries based on regional and industrial aggregates in

Table 55: Latin America & Caribbean Countries Based on Regional & Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.32*	.12	.18	.46**	.09	.20
U.S. Import	.20	.03	.07	.44**	.05	.18
U.S. Investment	.09	-.01	.02	.26	-.06	.01
Foreign Investment in the U.S.	-.12	-.09	-.10	-.08	-.14	-.14
Number of Students in the U.S.	.56***	.29	.36*	.58***	.20	.31*
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.39*	.34*	.38*	.25	.33*	.40*
Difference in Per Capita Gross National Income	.46**	.31	.38*	.39*	.43**	.47**
Difference in Gross Enrollment Ratio	.15	.39	.36	-.03	.27	.30
Difference in Expenditure for Research & Development	-.29	-.49	-.44	-.24	.10	.09
Difference in Professional Unemployment Ratio	-.05	-.06	-.07	.35	.18	.32
<u>Unemployment and Population</u>						
Professional Unemployment	.12	-.07	-.04	.67**	.23	.35
Total Occupational Unemployment	.42	.06	.19	.75***	.32	.40
Total Unemployment	.13	-.05	.01	.53**	.00	.10
Total Population	.17	.04	.06	.45**	.07	.18

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

1990 and 2000. In 1990, while professional migration was only moderately associated with U.S. export, and strongly positively related with number of students in the U.S. variable, it did not have any significant associations with other variables of this group for Latin America and Caribbean countries. On the other hand, whereas nonprofessional migration had a substantially important correlation with number of students in the U.S., none of its correlations with five cross-national interaction variables were statistically significant. While total migration seemed to have a moderate positive and statistically significant association with number of students in the U.S., it was not substantially or statistically correlated with other variables of cross-national interaction variables for Latin America and Caribbean countries in 1990.

In 2000, the correlations of professional migration with cross-national interaction variables seemed to be stronger than in 1990. Hence, professional migration had a moderate positive correlation with U.S. export and U.S. import and a strong positive association with number of students in the U.S., but it did not have significant correlation with the other two variables. Although nonprofessional migration had a moderate positive correlation with number of students in the U.S., it did not have any statistically significant correlation with all the variables of this group. On the other hand, although total migration had a medium positive and statistically significant correlation with the number of students, it did not have either substantially or statistically significant correlations with other cross-national interaction variables for Latin America and Caribbean countries in 2000.

Although each of the three migration variables was moderately positively correlated with difference in life expectancy, only professional migration and total migration were moderately positively associated with difference in per capita gross



national income with statistical significances. While these three migration variables usually had substantially important correlations with the other cross-national inequality variables, none of them were statistically significant for Latin America and Caribbean countries in 1990.

While all the three migration variables had a moderate positive and statistically significant association with difference in per capita gross national income, only nonprofessional and total migration seemed to have a moderate positive correlation with difference in life expectancy with statistical significances. On the other hand, all the three migration variables had relatively substantially significant correlations with other cross-national inequality variables, but none of those correlations were statistically significant for Latin America and Caribbean countries in 2000.

Although professional migration had a moderate positive association with total occupational unemployment at .42, none of its associations with unemployment and population variables were statistically significant for Latin America and Caribbean countries in 1990. On the other hand, both nonprofessional migration and total migration did not have a substantially or statistically significant relationship with all the four unemployment and population variables in 1990.

In 2000, even though professional migration was strongly positively correlated with professional unemployment and total unemployment and very strongly positively associated with total occupational unemployment, it was only moderately positively correlated with total population for this group. On the other hand, none of the correlations of nonprofessional migration and total migration variables with all the four unemployment and population variables were statistically significant even though nonprofessional migration and total migration had a moderate positive association with

professional unemployment and total occupational unemployment variables for Latin America and Caribbean countries.

Table 56 illustrates the correlations of professional migration, nonprofessional migration and total migration variables with the variables of cross-national interaction, cross-national inequality, and unemployment and population groups for Asian and Pacific countries based on regional and industrial aggregates in 1990 and 2000. In 1990 both professional migration and total migration variables were alike in that both variables had a moderate positive relationship with U.S. export and U.S. import variables, and a strong positive association with number of students in the U.S., but they did not have substantially or statistically significant relationships with other U.S. investment and foreign investment in the U.S. variables for Asian and Pacific countries. On the other hand, nonprofessional migration appeared to have a moderate positive relationship with U.S. import and number of students in the U.S. but it did not have substantially or statistically important correlations with the other three cross-national interaction variables in 1990.

In 2000, professional migration, nonprofessional migration and total migration were similar to each other for their correlations with cross-national inequality variables. The three migration variables had a moderate positive association with U.S. export and a strong positive relationship with U.S. import variables, but they did not have either substantially or statistically significant correlations with U.S. investment and foreign investment in the U.S. variables. On the other hand, while professional migration and total migration had a very strong positive correlation with number of students in the U.S., nonprofessional migration appeared to have only a strong positive association with the same variable for Asian and Pacific countries.

Table 56: Asian & Pacific Countries Based on Regional & Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.39**	.24	.37*	.38*	.32*	.40**
U.S. Import	.42**	.31*	.39**	.58***	.61***	.61***
U.S. Investment	.26	.13	.20	.18	.15	.17
Foreign Investment in the U.S.	-.04	-.06	-.08	.05	.00	.04
Number of Students in the U.S.	.56***	.44**	.51***	.75***	.59***	.71***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.11	-.08	-.06	-.09	-.12	-.11
Difference in Per Capita Gross National Income	.09	.15	.12	.13	.18	.17
Difference in Gross Enrollment Ratio	-.25	-.09	-.16	-.19	-.25	-.26
Difference in Expenditure for Research & Development	-.02	-.05	-.21	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	.35	.20	.33	.76***	.40	.60**
Total Population	.46**	.48**	.43**	.84***	.70***	.78***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

As cross-national inequality variables, difference in expenditure for research and development in 2000, and difference in professional unemployment ratio in 1990 and 2000 were excluded from correlation analyses due to missing data. None of the correlations of the three migration variables with cross-national inequality variables were statistically significant even though some of them were substantially important for Asian and Pacific countries in both years. Consequently professional migration had a weak negative association with difference in life expectancy and moderate negative association with difference in gross enrollment ratio in 1990. On the other hand, while nonprofessional and total migration had a weak positive relationship with difference in per capita gross national income, only total migration was weakly negatively correlated with difference in gross enrollment ratio and moderately negatively associated with difference in expenditure for research and development for Asian and Pacific countries in 1990.

In 2000, although professional migration had a weak positive association with difference in per capita gross national income, it was weakly negatively associated with difference in gross enrollment ratio. On the other hand, nonprofessional and total migration were alike in that both had a weak negative correlation with difference in life expectancy, a weak positive relationship with difference in per capita gross national income, and a moderate negative association with difference in gross enrollment ratio for Asian and Pacific countries.

Among the unemployment and population variables professional unemployment and total occupational unemployment were excluded from the correlation analyses due to missing data. In this base, professional migration, nonprofessional migration and total

migration variables were similar to each other because these three variables were moderately positively associated with total unemployment without statistical significances, but they had a moderate positive and statistically significant correlation with total population for Asian and Pacific countries in 1990.

In 2000, professional migration was very strongly positively correlated with total unemployment and total population at statistically important levels. While nonprofessional migration had a moderate positive but statistically insignificant association with total unemployment, it was very strongly positively correlated with total population variable. On the other hand, total migration was strongly positively correlated with total unemployment and very strongly positively associated with total population with statistical significances for Asian and Caribbean countries in 2000.

Table 57 shows the correlations of three migration variables with variables of cross-national interaction, cross-national inequality, and unemployment and population groups for OECD (Organization for Economic Cooperation and Development) countries based on regional and industrial aggregates in 1990 and 2000. Although the correlations of professional migration with U.S. import, U.S. export, U.S. investment, and number of students in the U.S. variables were all moderate positive, only the association of professional migration with U.S. export was statistically significant in 1990. On the other hand, while both nonprofessional and total migration had relatively weak or negligible associations with each of the five cross-national interaction variables, none of those associations were statistically significant in 1990.

In 2000, the correlations of three migration variables with cross-national interaction variables were much higher than in 1990. Therefore, both professional migration and total migration were strongly positively correlated with all four cross-

Table 57: OECD Countries Based on Regional & Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.42*	.19	.20	.79***	.50*	.86***
U.S. Import	.34	.14	.16	.74***	.52*	.84***
U.S. Investment	.27	-.03	-.02	.85***	.69***	.80***
Foreign Investment in the U.S.	.08	-.11	-.10	.73***	.70***	.73***
Number of Students in the U.S.	.24	.08	.09	.48*	.39	.62**
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	.71***	.76***	.76***	-.12	.01	-.19
Difference in Per Capita Gross National Income	.45*	.45*	.45*	.02	.04	.02
Difference in Gross Enrollment Ratio	.26	.40	.39	-.21	-.14	-.14
Difference in Expenditure for Research & Development	.34	.40	.39	-.07	-.08	-.08
Difference in Professional Unemployment Ratio	-.14	-.22	-.21	.07	.15	.00
<u>Unemployment and Population</u>						
Professional Unemployment	.24	-.03	-.01	.52*	.83***	.53*
Total Occupational Unemployment	.15	.01	.02	.41	.59*	.48
Total Unemployment	.10	-.02	-.01	.42	.63**	.49*
Total Population	.44*	.37	.38	.49*	.62**	.58**

Note: \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

national interaction variables based on U.S. export, U.S. import, U.S. investment and foreign investment in the U.S. However, while professional migration was moderately positively associated with number of students in the U.S. variable, total migration was strongly positively correlated with the same variable. On the other hand, while nonprofessional migration had a strong positive association with U.S. export, U.S. import and U.S. investment variables, and a very strong positive relationship with foreign investment in the U.S. with statistical significances, it did not have a statistically significant association with number of students in the U.S.

In 1990, the correlations of each of the three migration variables with all the cross-national inequality variables were similar to each other. Thus, all the three migration variables were very strongly positively correlated with difference in life expectancy and moderately positively associated with difference in per capita gross national income variables with statistical significances. On the other hand, without any statistical significance these three migration variables had a moderate positive association with difference in gross enrollment ratio and difference in expenditure for research and development variables. While nonprofessional migration and total migration were moderately negatively correlated with difference in professional unemployment ratio, professional migration was weakly negatively correlated with the same variable for OECD countries in 1990.

In 2000, none of the correlations of migration variables with cross-national inequality variables were statistically significant. However, there were some substantially significant associations among them. Such as professional migration had a weak negative association with difference in life expectancy and a moderate negative relationship with difference in gross enrollment ratio. On the other hand, while nonprofessional migration

was weakly negatively associated with difference in gross enrollment ratio, it was weakly positively related with difference in professional unemployment ratio variable. However, total migration had a weak negative association with difference in life expectancy and difference in gross enrollment ratio variables for OECD countries.

Professional migration appeared to have a moderate positive and statistically significant correlation with total population, but it did not have any statistically significant relationship with other unemployment and population variables in 1990. On the other hand, although both nonprofessional and total migration variables had a moderate positive association with total population, none of their correlations with all the four unemployment and population variables were statistically significant in 1990 for OECD countries.

In 2000, professional migration had a strong positive relationship with professional unemployment and a moderate positive association with total population with statistical significances, but its associations with total occupational unemployment and total unemployment variables were moderate positive without statistical significances. On the other hand, while nonprofessional migration was very strongly positively associated with professional unemployment, it was strongly positively associated with the other three unemployment and population variables with statistical significances. However, although total migration had strong positive associations with professional unemployment and total population variables, and a moderate positive correlation with total unemployment variable with statistical significances, it had a moderate positive but statistically insignificant relationship with total occupational unemployment for OECD countries.



Table 58 illustrates the correlations of three migration variables with cross-national interaction variables, cross-national inequality variables, and unemployment and population variables for Eastern Europe and former U.S.S.R countries based on regional and industrial aggregates in 1990 and 2000. Actually this table is the same as Table 52 that was represented with the same name but based on the different category. The purpose of putting Eastern Europe and former U.S.S.R countries group within another category is to compare this group with different world regions under the different categories

Although professional migration had a strong positive association with U.S. export and U.S. import variables, it had a very strong association with number of students in the U.S. in 1990. While nonprofessional migration had a moderate positive association with U.S. export and a strong positive association with U.S. import, it was very strongly associated with number of students in the U.S. On the other hand, total migration had a very strong association with U.S. export and U.S. import, but it was strongly positively associated with number of students in the U.S. But none of the migration variables was substantially and statistically correlated with U.S. investment and foreign investment in the U.S. variables for Eastern Europe and former U.S.S.R countries group in 1990.

In 2000, while both professional migration and total migration had a strong relationship with U.S. export and U.S. import, they had a very strong association with the number of students in the U.S. variable. Although nonprofessional migration was moderately positively associated with number of students in the U.S. it was not correlated substantially or statistically at significant levels with other cross-national interaction variables. However, like in 1990, in 2000 each of the three migration variables did not have any significant relationship with U.S. investment and foreign investment in the U.S.

Table 58: Eastern Europe & Former U.S.S.R. Countries Based on Regional Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.57***	.38*	.79***	.59***	.22	.58***
U.S. Import	.68***	.53**	.79***	.57**	.18	.58***
U.S. Investment	-.05	-.04	-.04	.14	.07	.11
Foreign Investment in the U.S.	.08	.10	.01	-.05	-.09	-.07
Number of Students in the U.S.	.73***	.75***	.53**	.84***	.42*	.74***
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-.15	-.17	-.07	.19	-.08	.17
Difference in Per Capita Gross National Income	.18	.19	.16	.17	.18	.21
Difference in Gross Enrollment Ratio	.07	.03	.24	-.08	-.07	-.10
Difference in Expenditure for Research & Development	-.27	-.26	-.24	-.07	-.06	-.14
Difference in Professional Unemployment Ratio	-	-	-	.33	.27	.47
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	.70**	.47	.81***
Total Occupational Unemployment	.39	.39	.36	.75**	.54*	.84***
Total Unemployment	.19	.19	.16	.77***	.59**	.85***
Total Population	.57***	.38*	.77***	.76***	.34	.76***

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

variables for Eastern Europe and former U.S.S.R countries group.

During 1990 and 2000 there were no statistically significant associations among the migration variables and cross-national inequality variables even though some of them were substantially important. Such as all three migration variables had a moderate negative association with difference in expenditure for research and development and a weak positive relationship with difference in per capita gross national income. Both professional migration and nonprofessional migration variables had a weak negative association with difference in life expectancy, in 1990.

In 2000, while the associations of professional migration and nonprofessional migration variables with difference in per capita gross national income were weak positive, the correlation of total migration was moderate positive with the same variable. Although only professional migration and total migration had a weak positive association with difference in life expectancy, each of the three migration variables had a moderate positive association with difference in professional unemployment ratio variable for Eastern Europe and former U.S.S.R countries.

Since professional migration did not have any statistically significant relationship with total occupational unemployment and total unemployment it had a strong positive and statistically significant relationship with total population in 1990. On the other hand, whereas nonprofessional migration was moderately positively correlated with total population, total migration was very strongly associated with the same variable, but both variables were not statistically significantly correlated with the other two variables of this group.

In 2000, both professional migration and total migration variables had a very strong relationship with each of the four unemployment and population variables.

However, while nonprofessional migration had a strong positive and statistically significant relationship with total occupational unemployment and total unemployment variables, it had no statistically significant relationship with professional unemployment and total population variables for Eastern Europe and former U.S.S.R. countries.

Table 59 shows the correlations of migration variables with variables of cross-national interaction, cross-national inequality, and unemployment and population groups for other countries based on regional and industrial aggregates in 1990 and 2000. However, all cross-national inequality variables and three unemployment and population variables were not used in correlation analyses due to missing data. In this base, all the three migration variables were alike in that all these three variables seemed to have a very strong positive relationship with U.S. export, U.S. import and number of students in the U.S. variables, but they did not have either substantially or statistically significant correlation with other U.S. investment, and foreign investment in the U.S. variables in 1990 for other countries group.

In 2000, even though professional migration had a strong positive association with U.S. export, U.S. import and number of students in the U.S. variables, none of its associations with all the cross-national interaction variables were statistically significant. On the other hand, nonprofessional migration and total migration were the same in having a perfect association with U.S. export, and U.S. import variables and a strong association with number of students in the U.S. However, the three migration variables did not have a statistically significant association with U.S. investment and foreign investment in the U.S. variables for other countries.

Although none of the migration variables had a statistically significant association with total population in 1990, each of the migration variables had a very

Table 59: Other Countries Based on Regional Industrial Aggregates  
Correlations for Migration Variables and Structural Variables by Years

Structural variables	1990 Migration variables			2000 Migration variables		
	Professional Migration	Nonprofessional Migration	Total Migration	Professional Migration	Nonprofessional Migration	Total Migration
<u>Cross-National Interaction</u>						
U.S. Export	.97***	1***	.99***	.53	.1***	1***
U.S. Import	1***	.95***	.99***	.53	1***	1***
U.S. Investment	-.07	-.04	-.07	.12	.48	.48
Foreign Investment in the U.S.	.25	.23	.24	.03	.29	.29
Number of Students in the U.S.	.81**	.91***	.85***	.50	.69*	.69*
<u>Cross-National Inequality</u>						
Difference in Life Expectancy	-	-	-	-	-	-
Difference in Per Capita Gross National Income	-	-	-	-	-	-
Difference in Gross Enrollment Ratio	-	-	-	-	-	-
Difference in Expenditure for Research & Development	-	-	-	-	-	-
Difference in Professional Unemployment Ratio	-	-	-	-	-	-
<u>Unemployment and Population</u>						
Professional Unemployment	-	-	-	-	-	-
Total Occupational Unemployment	-	-	-	-	-	-
Total Unemployment	-	-	-	-	-	-
Total Population	.38	.58	.46	.90***	.72*	.71*

Note: (-) indicates N is too small or missing data that are eliminated from analysis. \* =  $p \leq .05$ ; \*\* =  $p \leq .01$ ; \*\*\* =  $p \leq .001$ .

strong positive correlation with total population in 2000 for the other countries group.

Summary for the seven groups of all the world countries based on regional and industrial category: The associations of each of the three migration variables with cross-national interaction variables, cross-national inequality variables, and unemployment and population variables were substantial. However, the relationships of professional migration with these three groups of structural variables were generally much stronger than those associations of nonprofessional migration and total migration variables with those three groups of structural variables in 1990 and 2000. Based on the highest positive correlations of professional migration with each of the three structural variable groups, it is possible to list the seven groups of the world countries in both years.

The order of highest correlations of professional migration with cross-national interaction variables for the seven groups occurred in the following order. In 1990, other countries group was first, Sub-Saharan Africa was second, eastern Europe and former U.S.S.R. countries group was third, Asian and Pacific countries group was fourth, OECD countries group was fifth, Latin America and Caribbean group was sixth and Arab states was the last. In 2000 the order for the same kinds of correlations among the same variables for seven groups was that OECD countries group was first, Sub-Saharan Africa was second, Eastern Europe and former U.S.S.R. countries group was third, Asian and Pacific group was fourth, other countries group was fifth, Latin America and Caribbean group was sixth, and Arab states group was the last to have the highest correlations of professional migration with cross-national interaction variables.

The order from the highest positive toward the highest negative for the correlations of professional migration with cross-national inequality variables for seven groups existed as follows. In 1990, OECD countries group was first, Latin America and

Caribbean group was second, Sub-Saharan Africa was third, Arab states was fourth, Eastern Europe and former U.S.S.R. countries group was the fifth, Asian and Pacific countries group was the sixth and other countries group was the last due to missing data. In 2000, the order from the highest positive toward the highest negative for the same kinds of relationships among the seven groups took place in the following. Latin America and Caribbean group was first, Eastern Europe and former U.S.S.R countries group was second, Arab states group was third, Asian and Pacific countries group was fourth, OECD countries group was sixth, and the other countries group was the last for the lack of data.

The order of the highest correlations of professional migration with unemployment and population variables for seven groups of the world countries existed in the following. In 1990 Sub-Saharan Africa was first, Asian and Pacific was second, Eastern Europe and former U.S.S.R group was third, OECD countries group was fourth, Latin America and Caribbean was fifth, Arab states and other countries were last two groups with insufficient data. In 2000, the order for the same kinds correlations among the seven groups of the world countries occurred as follows. Asian and Pacific group was first, Eastern Europe and former U.S.S.R. group was second, Sub-Saharan Africa was third, Latin America and Caribbean was fourth, OECD countries group was fifth, again other countries group and Arab states group was the last two groups with insufficient data.

## CHAPTER VI

### SUMMARY AND CONCLUSIONS

#### Overview of the Study

This research is based on a longitudinal design covering the years of 1990 and 2000, and employs several national and international data about 221 world countries. In order to show the differences and similarities among the all the world countries and all the world regions in the volumes of their migration to the U.S in 1990 and 2000, this study uses two types of analyses. The first are based on the percentage distributions of three migration variables, such as professional migration, nonprofessional migration and other migration across the different groups of the five categories of all the world countries. The five categories of all the world countries consist of geographical region, human development index, per capita gross national income level, development level, and regional and industrial aggregates. The second are based on the correlation analyses of three migration variables in terms of professional migration, nonprofessional migration, and total migration with structural variables of immigrant sending countries based on cross-national interaction, cross-national inequality, and unemployment and population groups for each group of the five world categories.

After the analyses of the associations of the migration variables with the variables of cross-national interaction, cross-national inequality, and unemployment and population



groups, the study tests the effectiveness of the world system theory and development (modernization) theory in explaining the research findings in the case of the United States.

### Major Findings of the Study and Conclusion

The results of the descriptive analyses of the raw numbers and percentage distributions of the three migration categories across the different groups of each of five world categories showed some common tendencies of migration categories for all the world countries. Such as there was usually a decreasing pattern in the raw numbers of professional migration, nonprofessional migration and other migration categories from 1990 to 2000. This might be a result of the Immigration and Reform Control Act (IRCA) of 1986 that gave an opportunity to 2.6 million former illegal aliens in the U.S. to gain permanent resident status during 1989-1992. Consequently while there was usually a small decreasing pattern in the percentages of professional migration and a stronger decreasing pattern in the percentages of nonprofessional migration, there was a strong increasing pattern in the percentages of other migration category for all the different groups of the world countries from 1990 to 2000.

On the other hand, professional migration category had the lowest level percentage distribution of total migration among the three migration categories, but the difference in percentage distributions of professional migration across the different groups of all five categories was significant in some cases. In general high human development index countries group, high income countries group, industrial countries group, and OECD countries group had the highest percentage of professional migration within their category in 1990 and 2000.

In order to investigate cross-national and cross-regional variation in the size of professional migration, nonprofessional migration and total migration, all the world countries were divided into five categories, and each category was subdivided into several different groups. Later the correlations of three migration variables with the variables of cross-national interaction, cross-national inequality and unemployment and population groups were tested for each group of the five categories.

After the analyses of all world countries based on five different categories, the research findings showed that among the three migration variables, professional migration had relatively stronger correlations with each of the cross-national interaction variables, cross-national inequality variables, and unemployment and population variables in 1990 and 2000. General patterns indicated that while professional migration had the highest correlations with cross-national interaction variables and moderate associations with unemployment and population variables, it had the lowest correlations with cross-national inequality variables.

World system theory and development (or modernization) theory were used in the establishment of the main research theory. World system theory deals with immigration in global, political and economic context and claims that cross-national differences in the size of immigration to the developed countries as the results of varying degrees of their economic, political, and military involvement in sending countries (Light and Bonacich, 1988: Sasses, 1988). Therefore, world system theory considers a positive relationship between developed countries' involvement in sending countries and the size of immigration to those developed countries, and claims that foreign investment in and trade with the sending countries will increase immigration.

Development (or modernization) theory claims that every society is located at a certain stage of development and will transform from a lower level of development to a higher level of development. Depending on different stages of development, migration goes from less developed societies to more advanced ones. Thus, it predicts that countries with lower levels of development would have higher levels of immigration to the United States than countries with higher levels of development. More specifically, development theory connects immigration with domestic development of sending countries and claims that cross-national inequalities in the levels of development are main factors for migration (e.g., Hofstetter, 1984; Lamm and Imhoff, 1985).

Thus, the main research theory is that cross-national interaction and cross-national inequality between the U.S and different world countries, or different world regions are closely associated with the variation in the size of professional migration from all the world countries to the United States. Based on main theory, there are two main research hypotheses.

First main research hypothesis is that cross-national interaction based on economic interdependency and educational articulation between a sending country and the U.S. are more likely to have positive associations with the volume of professional migration from a sending country to the U.S.

Second main research hypothesis is that cross-national inequality between a sending country and the U.S. in terms of difference in living conditions, job and research conditions, and professional employment opportunities are more likely to be positively related with the amount of professional migration from a sending country to the U.S.

Based on empirical evidences, the analyses of results indicated several important findings. First, most of the groups of the five different world categories based on regional

aggregates, human development index, income aggregates, development level, and regional and industrial aggregates showed that the size of professional immigration to the U.S. usually have a strong positive relationship with the levels of cross-national interactions of these countries with the U.S. based on the five variables in 1990 and 2000. However, the relationships of professional migration with educational articulation variable were stronger than those associations of professional migration with the four economic interaction variables. These results are consistent with my first main research hypothesis that cross-national interactions based on economic interaction and educational articulation between a professional immigrant sending country and the U.S. have a positive association with the size of professional migration from a sending country to the U.S. These findings were also relevant to the studies of Ong, Cheng and Evans (1992), and Cheng and Yang (1998).

Specifically these results support the entire sub hypotheses of this research based on economic interactions and educational articulation. As economic interaction variables U.S. export to a sending country, U.S. import from a sending country, U.S. investment in immigrant sending country, immigrant sending country investment in the U.S. and as the educational articulation variable the number of students in the U.S. from immigrant sending countries have a strong positive relationship with the volume of professional immigration to the U.S. in 1990 and 2000. However, the strength of the correlations of the size of professional migration with U.S. investment, and foreign investment in the U.S. are lower than the strength of the correlations of professional migration with the other cross-national interaction variables, especially for Eastern Europe and former U.S.S.R. countries.

Based on the five categories of all the world nations as regional category, human development index category, income aggregates category, development level category, and regional and industrial aggregates category, the patterns of the correlations of professional migration with cross-national interaction variables existed in following order. Among the six groups of regional category, Oceania group was the first and Asian group was the last in 1990 and 2000. Based on three groups of human development index category, low human development group was the first, medium human development group was the last in 1990, but in 2000 high human development group was the first and again medium human development group was the last to have the highest correlations among those variables. Among the three groups of income aggregates, while low income group was the first, and medium income group was the last in 1990, in 2000 high income group was the first, but medium income group was the last again. Based on the four groups of development level category, although industrialized group was the first and Eastern Europe and former U.S.S.R. group was last in 1990, industrialized group was the first and developing countries group was the last in 2000. Among the seven groups of regional and industrial aggregates category, while other countries group was the first in 1990, OECD countries group was the first in 2000, Arab states group was the last in both years to have the highest correlations of professional migration with cross-national interaction variables.

Second important finding is that the associations between the size of professional migration and cross-national inequality variables were usually negligible or weak negative and statistically insignificant for most of the groups of the five main categories. This result is inconsistent with the second main research hypothesis and modernization theory based on empirical evidences. Since by using the modernization theory, I

hypothesized that the differences in structural factors between the United States and immigrant sending countries are positively associated with the volume of professional immigration to the U.S. More specifically the difference in life expectancy, difference in per capita gross national income, the difference in gross enrollment ratio, the difference in expenditure for research and development, and the difference in professional unemployment ratio between the U.S. and immigrant sending countries had a positive association with the volume of professional migration to the U.S. However, these kinds of associations among those variables indicate that the inequalities between immigrant sending countries and the U.S. were not significantly positively related with the size of professional immigration to the U.S. Moreover, the size of professional migration usually had a weak negative association with the cross-national inequality variables. That means the higher differences between the U.S. and immigrant-sending countries resulted in less professional immigration to the U.S. This result was also irrelevant to the common belief and former studies about this topic (Flasser, 1973; Fribourg, 1975; Portes, 1976; Cheng and Yang, 1998), but partly support Ong, Cheng and Evans (1992) study indicating that relatively wealthier Asian developing countries are a bigger source of professional migration. Therefore, the degree to which sometimes living in a developed country may give more opportunities to well educated people to migrate to the most developed countries.

General patterns of the associations of professional migration with the cross-national inequality variables for each group of the five main categories were observed as follows. Among the six regional groups, while South America was the first, Oceania was the last to have the highest correlations between professional migration and cross-national inequality variables in 1990 and 2000. Based on human development category,

although high human development group was the first and low human development group was the last in 1990, medium human development group was the first and high human development group was the last in 2000. Among the three income groups, medium income countries group was the first and low income countries group was the last in both years. Based on the four development level groups, while the least developed countries group was the first in 1990, and Eastern Europe and former U.S.S.R. group was the first in 2000, industrialized countries group was the last in 1990 and 2000. Among the seven groups of regional and industrial category, OECD countries group was the first and Asian and Pacific group was the last in 1990, in 2000 Latin America and Caribbean group was the first and OECD countries group was the last to have the highest correlations of professional migration with cross-national inequality variables. Specifically, South America, medium human development, medium income countries, and Latin America and Caribbean groups appeared to have the highest association of the size of professional migration with the differences between the U.S. and immigrant sending countries in their structural characteristics.

Third important finding is that I used professional unemployment, total occupational unemployment, total unemployment, and total population based on unemployment and population group as a kind of control variables. The results showed that all variables of this group had usually an important positive relationship with the size of professional migration to the U.S. and these relationships among these variables were higher in 2000 than in 1990. There were some tendencies among the five world categories to indicate the relative strength of associations of professional migration with these unemployment and population variables. Thus, among the six regional groups Asia was first and Oceania was the last in both years to have the highest those kinds of

relationships. Among the three groups of human development category, low human development group was the first and high human development group was the last in 1990 whereas in 2000 medium human development was the first and high human development group was the second. Based on the three groups of income level category, low income countries group was the first in both years, but medium income group was the last in 1990 and high income group was the last in 2000. Among four groups of development level category, while least developed group was the first and developing countries group was the last in 1990, developing countries group was the first and industrialized countries group was the last in 2000. Among the seven groups of regional and industrial category, Sub-Saharan Africa was the first and Latin America was the last in 1990, but in 2000 Asian and Pacific countries group was the first and OECD countries group was the last to have the highest relationships between the volume of professional migration and unemployment and population variables. Arab states and other group were not included in this list due to lack of data in both the years.

Fourth, although the relationships of the volume of professional migration with the difference in professional unemployment ratio were usually weak negative and insignificant, the associations of the size of professional migration with professional unemployment number were strong positive and significant for most of the groups of the five world categories. Moreover, the levels of relationships between these variables were mostly higher in 2000 than in 1990. Hence, the differences in professional unemployment ratio between immigrant sending countries and the U.S. were not associated significantly with the size of their professional immigration to the U.S. However, professional unemployment number was strongly positively correlated with the volume of



professional immigration to the U.S. because the variations in the number of professional unemployment among the immigrant sending countries were significantly high.

### Implication of the Study

The research findings showed that although international interaction between immigrant sending countries and the United States was a fundamental indicator to explain the variation in the size of professional migration to the U.S. from all the world countries, international inequality between immigrant sending countries and the U.S. was not effective indicator to explain the changes among all the world countries in sending their professional immigrants.

This research had sufficient data about cross-national interaction variables for all world countries that represented the real situation of the fact in supporting world system perspective, which was very effective in explaining one aspect of professional migration. However, the research did not have sufficient data about the cross-national inequality variables that might not represent the real situation in supporting the modernization (or development) approach. Thus, sufficient data about the cross-national inequality variables are necessary to reach much more effective results.

Moreover, the research variables based on international inequality seemed to be insufficient so that other kinds of variables could be used to show the relationships between international inequality and the size of professional migration to the U.S.

On the other hand, it was expected that the higher difference in cross-national inequality between the U.S. and the world countries the higher the amount of professional migration. However, even though European countries group, high income countries group, and OECD countries group were considered to have a lower level of cross-

national inequality with the U.S. than the other groups have, these groups in some cases appeared to have important positive associations of professional migration with the cross-national inequality variables. So that developed countries should be more carefully investigated to see their real relationships with professional migration.

The significant difference between professional unemployment ratio and professional unemployment number in explaining the variation for the size of professional migration to the U.S. from all the world countries is very important for seeing different aspects of the structural variables. Thus, the researcher should be very careful before deciding which aspect of reality he/she is considering. Otherwise the significance of the study and the findings would weaken seriously.

On the other hand, most of the international inequality variables had serious missing values, so that this insufficient data could seriously influence the research findings to bring more clear evidence about reality. Thus, complete data would be necessary to examine the professional migration issue effectively.

This research does not include all factors that influence the variations in the volumes of immigration from all the world countries to the U.S. from 1990 and 2000. In this period other factors such as the Gulf war during 1990, global economic crisis among the world countries, and some structural changes in some countries and some regions, for example, the collapsing of some countries and blocks and existing new countries and new regional blocks, and reunifying formerly separated countries can be important factors to change the volumes of total migration in general and the volumes of professional migration in specific.

## Suggestions for Future Research

Actually the time difference between 1990 and 2000 maybe too close to conduct a longitudinal study, so that future research can extend this time period. The international inequality variables of this research seemed to be ineffective indicators for the relationship of cross-national inequality with the size of professional migration. Thus, future research should employ new variables for the study of professional migration. In addition to world system and development (or modernization) theories, the next research should incorporate other theoretical perspectives. Future research can deal with institutional or organizational network of professional immigrant to bring more effective explanations about the brain drain problem. Future research can also study on the gender of professional immigrants.

## Limitations of the Study

There are several important limitations of this research. First is the limitation of the data. Since the data were collected from different sources for all the world countries with different levels of economic, social and political development, it was not possible to find complete data about all the world countries apart from migration data. Especially the small and least developed countries were missing a certain part of their data because they either do not have an efficient system or an institution to collect those kinds of data in their countries.

In the periods of 1990 and 2000 some countries collapsed such as the former Union of Soviet Socialist Republics (U.S.S.R.), other countries existed like Central Asian countries, Kazakhstan and Azerbaijan, and some countries were reunified for example

West Germany and East Germany reunified as Germany. In this study if the two countries were reunified during or after 1990 they are considered as one country and their data were combined together for all categories. If the countries existed between 1991 and 1995, the closed years were taken to get enough data about those countries for the year 1990. On the other hand, if a country was missing values, the values of adjacent year from the same source were used.

The missing data for many countries about the unemployment levels and the expenditure for research and development as percentage of GNP resulted in many countries being eliminated in the analysis that considerably decreased the representativeness of the data and the significant levels of measurement of associations.

Second, due to these difficulties, the data did not let the researcher use more specific multivariate analysis in this research. Thus, correlation analyses seemed to be better to analyze the relationships of three migration variables with 14 variables of cross-national interaction, cross-national inequality, and unemployment and population groups.

Third, in order to investigate the complex issue of brain drain, the research used only two theoretical perspectives, world systems theory and development (or modernization) theory. Because these two perspectives are better to deal with specifically macro level social and economic factors of immigrant sending and immigrant receiving countries than other theoretical perspectives. I believe that using many theoretical perspectives may complicate the issues rather than contribute to understanding the relationships of professional migration with macro level structural factors.

Fourth limitation is that the research is based on examining the relationships of migration variables especially professional migration with cross-national interaction, cross-national inequality, and unemployment and population groups variables. Thus, the

association between the variables does not necessarily mean that one variable causes the other.

## BIBLIOGRAPHY

- Adams, Walter (Ed.). 1968. The Brain Drain. New York: Macmillan.
- Amin, S. 1974. "Introduction." In Modern Migrations in Western Africa. Ed. S. Amin. London: Oxford University Press for International African Institute. Pp. 1-27
- Amjad, R. 1989. "Economic Impact of the Migration to the Middle east on the Major Labor Sending Countries—An Overview" In to the Gulf and Back: Studies on the Economic Impact of Asian Labor Migration. Ed. R. Amjad New Delhi: International Labor Organization, pp. 1-27
- Amugazer, J. 1968. "Brain Drain and Irony of Foreign Aid Policy", Economia Internazionale, 21(4), pp. 679-719.
- Appleyard, R. 1985. "Process and Determinants of International Migration," paper presented to the IUSSP Seminar on Emerging Issues in International Migration, Bellagio, May.
- . 1991. International Migration: Challenge For The Nineties, International Organization for migration, Geneva.
- Arnold, E. and N. M. Shah. 1986. "Asian Labor Pipeline: An Overview." In Asian Labor: Pipeline to the Middle East. Ed. E. Arnold and N. M. Shah. Boulder, CO: Westview Press, pp. 3-16.
- Ash, M.G. and A. Sollner 1996. "Introduction," In M.G. Ash and A. Sollner, (Eds), Forced Migration and Specific Change, German Historical Institute, Cambridge University Press, Washington DC, 1-22.
- Baldwin, G.B. 1970. "Brain Drain or Overflow?" Foreign Affairs, 48(2), pp. 157-179.
- Bechhofer, F. (Ed.). 1969. Population growth and Brain Drain. Birmingham: The Keynote Press.
- Becker, Gary. 1964. Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. New York: National Bureau of Economic Research.
- Benoit, P. and F. Micheau. 1989. "L'Intermediaire Arabe?", in M. Serres, Elements d'histoire des sciences, Paris: Bordas, pp. 151-175.

- Bhagwati, J.N. 1976. The Brain Drain and Taxation-Theory and empirical Analysis. Amsterdam: North Holland Publishing Co.
- Bhagwati, J.N. and M. Rao. 1994. "Vive les etudiants etrangers", Corrier international, 204 (28 September-5 October).
- Bhagwati, J.N. and W. Dellalfar, 1973. "The Brain Drain and Income Taxation," World Development, 1, pp. 94-101.
- Bohning, W.R. 1977. Compensating Countries of Origin for the Out-Migration of Their People. ILO-WEP, 2-26/WP. 18E. Geneva: International Labor Office.
- Bohning, W.R. 1982. Towards a System of Recompense for International Labor Migration. ILO-MIG WP.2 Geneva: International Labor Office.
- Borjas, G. 1999. Heaven's Door Immigration Policy and the American Economy. New Jersey: Princeton University Press
- Brinley, T. 1968. "Modern Migration." In W Adams (Ed.), The Brain Drain. New York: Macmillian.
- Brzezinski, M.A. 1993. Migration and Opportunity: A Qualitative Investigation Of the Chinese Students Brain Drain Phenomenon: [CD-ROM]: Abstract from: ProQuest File: Dissertation Abstract Item: 9320296.
- Cao, Xiaonan. 1996. "Debating 'Brain Drain' in the Context of Globalization," British Comparative and International Educational Society, Vol. 26, No. 3: 269-285.
- Carrington, W. and E. Detragiache. 1999. "International Migration and the Brain Drain." Finance and Development, June: 36-49
- Chang, S.L. 1992. "Causes of Brain Drain and Solutions, The Taiwan experience," Studies in Comparative International Development, 27(1), pp. 27-43
- Chapman, M. and R.M. Prothero. 1983. "Themes on Cirmlation in the Third World," International Migration review 17: 597-632.
- Cheng, Lucie, and Edna Bonacich. 1984. Labor Immigration Under the Capitalism. Berkeley: University of California Press.
- Cheng, Lucie, and Philip Q. Yang. 1998. "Global Interaction, Global Inequality, and Migration of the Highly Trained to the U.S." International Migration Review Vol. 32, No. 3: 626-653.
- Coa, X. 1996. "Debating Brain Drain in the Context of Globalization" British Comparative and International Education Society, vol. 26, no.3, pp. 269-285.

- Coutsoumaris, G. 1968. Greece. In W. Adams (Ed.) The Brain Drain (pp. 166-182). New York: Macmillan.
- Dandekar, V.M. 1968. India. In W. Adams (Ed.) The Brain Drain (pp. 203-232). New York: Macmillan.
- Das, M.S. 1971. "The Brain Drain Controversy in a Comparative Perspective", International Review of Comparative Sociology, 1(10), pp. 55-65.
- Dedijer, S. 1968. "Early Migration." In W. Adams (Ed.). The Brain Drain. New York: Macmillan, pp. 9-28.
- Deng, Zhiduen. 1990. Brain drain and Chinese Oversea Education Movement—Causes, Implications, and Policy opinions. [CD-ROM] Abstract from; ProQuest File Dissertation Abstract Item: 9032270.
- Devan, J. and P.S. Tewari. 2001. "Brains Abroad" The McKinsey Quarterly, 2001 Number 4 emerging market
- Fawket, J. 1983. "Networks Linkages and Migration Systems," International Migration Review, 23 (3): 671-680.
- Fawket, J. and E. Arnold. 1987. "Explaining Diversity: Asian and Pacific Immigration Systems." In Pacific Bridges: The New Immigration from Asia and Pacific Islands. Ed. J. Fawket and B. Carino. New York. Center for Migration Study.
- Findlay, A. 1995. "Skilled Transient: The Invisible Phenomenon?", in R Cohen (Ed.), The Cambridge Survey of World Migration, Cambridge University Press, Cambridge, 515-522.
- Findlay, A. and L. Garrick. 1989. "Skilled Scots," Applied Population Research Unit Discussion Papers, No 89, University of Glasgow.
- Forbes, D. 1984. The Geography of Underdevelopment. Baltimore, MD: John Hopkins University press.
- Fox, W. 1995. Social Statistics: An Introduction Using MicroCase. Bellevue, WA: MicroCase Corporation
- Friberg, G. 1975. Brain Drain Statistics: Empirical Evidences and Guidelines, the Committee on Research Economics, Stockholm.
- Gaillard, J. 1991. Scientists in the Third World. Lexington: Kentucky University press.
- Gaillard, J. and A.M. Gaillard. 1997. "Introduction: The International Mobility of Brains: Exodus or Circulation?" Science, Technology and Society 2 (2): 195-228.



- , 1998. International Migration of the Highly Qualified: A Bibliographic and Conceptual Itinerary. NY: The Center for Migration Studies of New York, Inc.
- Glaser, W.A. 1973. The Migration and the Return of Professionals, paper presented at the International Sociological Association, Research Committee on Migration, University of Waterloo, Colombia University press, New York.
- Glaser, W.A. and G.C. Habers. 1978. The Brain Drain: Emigration and Return. UNITAR Research Report. Oxford: Pergamon Press.
- Goss, J.D. and B. Lindquist. 1995. "Conceptualizing International Labor Migration: A Structuration Perspective," International Migration Review, 29 (2): 317-351.
- Granberg, 1967. The Migration of Scientists in Antiquity. Mimeo University of Lund, Lund.
- , 1969. Migration av veteskafter under hög-och-senmedeltiden en historisk studie, Mimeo, University of Lund, Lund.
- , 1977. "Reflections on the Present State of the Brain Drain and a Suggested Remedy", Minerva, 14(2), pp/ 209-224.
- Grubel, H.G. 1966. "The International Flow of Human Capital. Theoretical Analysis of Issues Surrounding Foreign Students Electing not to return to Their Countries," The American Economic Review, 56(2), pp.268-274.
- Grubel, H.G. and A.D. Scott. 1966. "The Cost of U.S. College Student Exchange Programs, Journal of Human Resources, 1, pp. 79-98
- , 1977. The Brain Drain: Determinants, Measurement and Welfare Effects. Waterloo, Canada: Wolfrid Laurier University Press.
- Hatton, T. J. & J.G. Williamson. 1998. The Age of Mass Migration: Causes and Economic Impact. New York: Oxford University Press.
- Hoch, P. and J. Platt. 1992. "Migration and Denationalization of Science," in E. Crawford, T. Shin and S. Sorlin, Denationalizing Science. London: Kluwer, pp. 133-152.
- Hoek Van F.J. 1970. The Migration of High Level Manpower from Developing to Developed Countries. Mouton: The Hague.
- Hofstetter, Richard R. 1984. "Economic Underdevelopment and the Population Explosion: Implications for U.S. Immigration Policy." In U.S. Immigration Policy, edited by Richard R. Hofstetter, pp. 55-79. Durham, NC: Duke University Press.

- Huang, Wei-Chiao. 1984. *A Study of the Indirect Immigration of Professional Manpower to the United States* [CD-ROM]: Abstract from: ProQuest File: Dissertation Abstract Item: 8428612.
- Hugo, G. and J. B. Singhanetra-Renard. 1987. Asian International contact Labor Migration: Major Issues and Implications. Summary of the proceedings of workshop held under IDRC auspices at Chiang Mai University, November 16-20.
- Institute of International Education. 1990. Open Doors 1989/90: Report on International Educational Exchange. New York, NY: Institute of International Education.
- , 2000. Open Doors 2000: Report on International Educational Exchange. New York, NY: Institute of International Education.
- International Labor Organization. 2002. "Labor Statistics of International Labor Organization Bureau of Statistics, LABORSTA." On the World Wide Web at <http://laborsta.ilo.org/cgi-bin/brokerv8.exe> (December, 2002).
- Iredale, Robyn. 1999. "The Need to Import Skilled Personnel: Factors Favoring and Hindering Its International Mobility." International Migration, vol. 37 (1): 89-123.
- , 2000. "Migration Policies for the Highly Skilled in the Asia-Pacific region." The International Migration Review; New York; Fall vol. 34, issue 3, pp. 882-906.
- Isbister, J. 1996. The Immigration Debate. West Hartford, Connecticut: Kumarian Press Inc.
- Johnson, H.G. 1965. "The Economics Of Brain Drain: The Canadian Case," Minerva, 3(3), pp. 299-311.
- , 1967. "The Letter to the Editor on Thomas the International Circulation of Human Capital", Minerva, 6, pp. 105-112.
- , 1968. "An International Model," in W. Adam, (Ed.), Brain Drain, New York Macmillan.
- Jumare, I.M. 1997. "The Displacement of Nigerian Academic Community," Journal of Asian and African Studies, vol. 32: 110-119.
- Kallen, D. 1994. "Brain Drain and Development: Opportunity or Threat?", Higher Education Policy, 7(4) December, pp. 11-15.
- Kearney, M. 1986. "From the Invisible Hand to Visible Feet: Anthropological Studies of Migration and Development," Annual Review of Anthropology, 15: 331-361.

- Kelely, C.B. 2000. Demography and International Migration. In Migration Theory. Ed. B. Brettel & J. F. Hollifield; New York, NY: Roudedge.
- Kibre, P. 1948. The Nations in the Medieval Universities. Cambridge, Mass: Medieval Academy of America.
- Kirtz, M.M. 1987. "The Global Picture of Contemporary Immigration Patterns." In Pacific Bridges: The New Immigration from Asia and the Pacific Islands. Ed. J. T. Fawcett and B. V. Carino. New York: Center for Migration Studies, pp. 29-51.
- Kidleberger, G.P. 1977. Internationalist and Nationalist Models in the Analysis of Brain drain: Progress and Unsolved Problems,' Minerva, 15(3-4). Pp. 553-61.
- Kritz, M. and H. Zlotnik. 1992. "Global Interactions: Migration Systems, Process and Policies." Intenational Migrtion system: A Glaobal Approach. Ed. M. Kritz, L. Lim, and H. Zlotnnik. Oxford: Clarendon Press.
- Lamm, Richard, and Gary Imhoff. 1985. The Immigration Time Bomb: The Fragmenting of America. New York, NY: Truman Tally Books.
- Lande, Stephen, and Nellis Crigler. "Trade Policy as a Means of Reduce Immigration." In Unauthorized Migration: Addressing the Root Causes. Research Addendum sponsored by Commission for the Study of International Migration and Cooperative Economic Development, Vol. 1: 531-554. Washington DC: U.S. Government Printing Office.
- Lewis, W. A. 1954. "Economic Development with Unlimited Supplies of Labor," The Manchester School of Economic and Social Studies, 22: 131-191
- Light, Ivan, and Edna Bonacich. 1988. Immigration Entrepreneur. Berkeley: University of California Press.
- Logan, B.I. 1987. "The Reverse Transfer of Technology from Sub-Saharan Africa to the United States," Journal of Modern African Studies, vol. 25, no 4, pp. 297-612.
- Mackay, D.I. 1969. Geographical Mobility and The Brain Drain. London: George Allen & Unwin LTD.
- Malhotra, K. 1998. "Globalization and Economic Growth Paradigm: Some Implications for Labor Migration and Mobility," paper presented as Conference on Labor Migration and Mobility in China and Asia, Asia Pacific Institute, Chinese Academy of Social Sciences, Beijing, 17-19 April.
- Mandi, P. 1981. "The Brain Drain: A Sub-system of Center-periphery Relationship." Development and Peace, Spring Vol. 2: 35-52.
- Massey, D.S. 1990. "Social Structure, Household Strategies, and the Cumulative

- Causation of Migration," Population Index, 56(1): 3-26.
- Massey, D.S. J. Arongo, G. Hugo, A. Kouaouci, A. Pellegrino and J.E. Taylor. 1993. "Theories of International Migration: A Review and Appraisal," Population and Development Review 13 (3):431-466.
- , 1994. "An Evaluation of International Migration Theory: The North American Case." Population and Development Review, 20 (4): 699-751.
- , 1998. Worlds in Motion: Understanding International Migration at the End of the Millennium. New York: Oxford University Press.
- McKnight. 1971. Scientists Abroad. UNESCO: Paris
- Metaferia, G. and S. Maigenet. 1991. The Ethiopian revolution of 1974 and Exodus of Ethiopia's Trained Human Resources. Lewiston New York: The Edwin
- Mundende, D.C. 1989. 'Brain Drain, Brain Gain and Scientific Communities: Indian Experience in the Field of Biotechnology' paper presented at the conference on International Scientific Migration, Bogota, Colombia, 23-26 June.
- Myers, R.G. 1972. Education and Emigration: Study Abroad and the Migration of Human Resources. New York: David McKay, Inc.
- Myint, H. 1968. "The Underdeveloped Countries: A Less Alarmist View." In W. Adams (ed.). The Brain Drain. New York: Macmillan.
- Myrdal, G. 1957. Rich Lands and Poor. New York: Harper and Row.
- Odunsi, B.A. 1996. "An Analysis of Brain drain and Its Impact on Manpower Development in Nieria," Journal of Third World Studies, vol. 13, no 1:193-214.
- Oh, Tai K. 1973. "Estimating the Migration of U.S. Education Manpower from Asia to the U.S." Social and Economic Studies. 22 (3), pp. 335-357.
- , 1977. The Asian Brain Drain: A Factual and Causal Analysis. San Francisco, California: R & E Research Associates, Inc.
- Ong, P. M., L. Cheng, and L. Evans. 1992. "Migration of Highly Educated Asians and Global Dynamics," Asian and Pacific Migration Journal, Vol. 1, No. 3-4: 543-567.
- Organization for Economic Cooperation and Development (OECD) 1997 SOPEMI: Trends in International Migration: Continuous Reporting System on Migration Annual Report, 1996. Paris: OECD.

- Orleans, L.A. 1988. Chinese Students in America: Policies Issues, and Numbers. Washington, DC: National Academy Press.
- Oteiza, E. 1968. Differential Push Pull-Approach. In W. Adams (Ed.) The Brain Drain (pp. 120-134) New York: Macmillan.
- Oteiza, E. 1971. "Emigracion de Profesionales, Technicosy Obreros Calificados Argentinos a Los Estados Unidos." Desarrollo Economico, 10: 429-454.
- Parsons, E.A. 1952. The Alexandrian Library. Amsterdam: Elsevier
- Petras, Elizabeth. 1981. "The Global Labor Market in the Modern World economy." In Global Trends in Migration: Theory and Research on International Population Movements, edited by Mary M. Kritz, Charles B. Keeley, and Silvano M. Tomasi, pp. 44-63. New York, NY: Center for Migration Studies.
- Piore, M.J. 1979. Birds of Passage: Migrant Labor in Industrial Societies. New York: Cambridge University Press.
- Portes, Alejandro. 1976. "Determinants of Brain Drain," International Migration Review, Vol. 10, No. 4: 489-508.
- Portes, Alejandro, and Robert L. Bach. 1985. Latin Journey: Cuban and Mexican Immigrants in the United States. Berkeley: University of California Press.
- Prothero, R.M. 1987. "Population on the Move," Third World Quarterly, 9(4): 1282-1310
- Ranis, G. and J. H. Fei. 1961. "A Theory of Economic Development," American Economic Review, 51 (4):533-566.
- Rao, Lakshmana G. 1973. "Asian Student Facing an Australian Environment." The Problems of University Life. Combined Triennial Meeting of the Australia and New Zealand Student Health Association and Australian Association of University Counselors. Canberra: Australian National University.
- . 1979. Brain Drain and Foreign Students. New York: St. Martin's Press.
- Salomon, J.J. 1973. 'L'exode des cerveaux, resultants d'une enquete de l'OCDE' in WHO, La formation Des chercheurs en science medicale. Report of a panel discussion organized by CIOMS, Geneva, 10-11 September 1970. Geneva: WHO, pp. 105-111.
- Salt, J. and A. Findlay. 1989. "International Migration of Highly Skilled Manpower:

- Theoretical and Development Issues,” in R. Appleyard (Ed.), The Impact of International Migration on Developing Countries; Organization for Economic Cooperation and Development, Paris, 109-128
- Sassen, Saskia. 1988. The Mobility of Labor and Capital. Cambridge: Cambridge University Press.
- Saxenian, A. L. 2002. “Brain Circulation: How High Skill Immigration Makes Everyone Better Off” Brookings Review 2002, 20, 1, winter, 28-31.)
- Simanovsky, S., M. Strepetova, and Y. Naido. 1996. “Brain Drain from Russia: Problems, Prospects, Ways of regulation, Nova Science Publishers, New York.
- Skeldon, R. 1990. Population Mobility in Developing Countries: A Reinterpretation. London: Belhaven Press.
- , 1997. “Rural-to-Urban Migration and Its Implications for Poverty Alleviation,” Asia-Pacific Population Journal 12(1): 3-15
- , 1999. Migration and Development: A Global Perspective. Essex, England: Longman Books
- Song, 1997. “From Brain Drain to Reverse Brain Drain: Three Decades of Korean Experience,” Science Technology and Society 2:2, pp. 317-345.
- Stahl, C. W. 1986a. International Labor Migration: A Study of the ASEAN Countries. New York: Center for Migration Studies.
- Stark, O. 1991. The Migration of Labor. Cambridge, MA: Basil Blackwell.
- Stark, O. and D. Levhari. 1982. “On migration and Risk in LDC,” Economic Development and Cultural Change, 31: 191-196.
- Todaro, M. 1989. Economic Development in the Third World. New York: Longman.
- UNCTAD (United Nations Conference on Trade and Development). 1974. The Reverse Transfer of Technology: Economic Effects of the Trained Personnel from Developing Countries, UNCTAD Trade and Development Board, GI74-45088, Mimeo.
- , 1987. Trends and Current Situation in Reverse Transfer of technology. Study Prepared by the UNCTAD Secretariat, UNCTAD doc. TD/B/AC. 35/16, Geneva.
- UNDP (United Nations Development Programme). 1991. Human Development Report 1991. New York, NY: Oxford University Press.

- , 1993. Human Development Report New York, NY: Oxford University Press.
- , 2001. Human Development Report New York, NY: Oxford University Press.
- , 2002. Human Development Report 2002: Deepening Democracy in a Fragmented World. New York, NY: Oxford University Press, Inc.
- , 2003. Human Development Report New York, NY: Oxford University Press.
- United Nations Economic and Social Affairs. 20001. World Population Prospects the 2000 Revision Volume I: Comprehensive Tables. New York.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 1999. UNESCO Statistical Yearbook 1999. The United States: UNESCO Publishing and Bernan Press.
- UNESCO Institute for Statistics of Science and Technology. 2002. "Expenditure for Research and Development as a Percentage of Gross National Product, Selected Indicators Data for World Countries During 1996-2000." On the World Web at [http://portal.unesco.org/uis/ev.php?URL\\_ID=5180&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201&reload=1038209836](http://portal.unesco.org/uis/ev.php?URL_ID=5180&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1038209836), (November 2002).
- U.N. Population Division. 2002. "World Population Prospect" On the World Wide Web at <http://esa.un.org/unpp/index.asp?panel=1> (December, 2002).
- , 2003. "World Population Prospects: the 2002 Revision Population Database and Definition of Regions." On the World Wide Web at <http://esa.un.org/unpp/definition.html> (February, 2003).
- U.S. Bureau of the Census. 1993. Statistical Abstract of the United States: 1993 (113th edition.) Washington DC, 1993.
- , 2001. Statistical Abstract of the United States: 2001 (121th edition.) Washington, DC, 2001.
- U.S. Bureau of the Census. 2002. "Statistical Abstract of the U.S. for Export and Import Data in 1990 and 2000." On the World Wide Web at <http://www.census.gov/foreign-trade/balance/index.html#B> (November 19, 2002).
- U.S. Bureau of Economic Analysis. 2002. "Foreign Direct Investment in the U.S. in 1990: Detailed Annual Balance of Payments and Position Estimates 1987-1999 zipped ASCII files." On the World Wide Web at <http://www.bea.doc.gov/bea/di/di1fdibal.htm> (September 26, 2002).
- , 2002. "Foreign Direct Investment in the U.S. in 2000: Country Detail for Position, Capital Flows and Income 1997-2001." On the World Wide Web at <http://www.bea.doc.gov/bea/di/di1fdibal.htm> (September 26, 2002).

- , 2002. "U.S. Direct Investment Abroad in 1990 and 2000: Detailed Annual Balance of Payments and Position." On the World Wide Web at <http://www.bea.doc.gov/bea/di/di1usdbal.htm> (October 31, 2002).
- U.S. Immigration and Naturalization Service (INS). 1991. Statistical Yearbook of the Immigration and Naturalization Service, 1990. U.S. Government Printing Office: Washington, DC.
- , 1997. Statistical Yearbook of the Immigration and Naturalization Service, 1993. U.S. Government Printing Office: Washington, DC.
- , 2002. "Statistical Yearbook of the Immigration and Naturalization Service, Fiscal Year 2000." on the World Wide Web at <http://www.ins.usdoj.gov/graphics/aboutins/statistics/IMM00yrbk/IMM2000list.htm> (September, 2002).
- U.S. Immigration and Naturalization Service (INS), Statistical Division.  
Unpublished Documents about Detail Run 408 Immigrants Admitted by Country or Region of Birth and Major Occupation Group Fiscal Year 1990.
- , Unpublished Documents about Detail Run 408L Legalized Aliens Admitted by Country or Region of Birth and Major Occupation Group Fiscal Year 1990.
- Wang, Wenchang. 1993. Class Ideology, and Migration Decisions: Brain Drain from Socialist China to the United States: [CD-ROM]: Abstract from: ProQuest File: Dissertation Abstract Item: 9318740.
- Watanabe, S. 1969. "The Brain Drain from Developing to Developed Countries", International Labor Review, 99(4), pp. 401-433.
- Wood, C.H. 1982. "Equilibrium and Historical-Structural Perspectives on Migration," International Migration Review, 16: 298-319.
- World Bank. 1991. World Development Report 1991: The Challenge of Development. New York, NY: Oxford University Press, Inc.
- , 1992. World Development Report 1992: Development and Environment. New York, NY: Oxford University Press, Inc.
- , 1993. World Development Report 1993: Investing in Health. New York, NY: Oxford University Press, Inc.
- , 2002. World Development Report 2002: Building Institutions for Market. New York, NY: Oxford University Press, Inc.



- , 2003. World Development Report 2003: Sustainable Development in a Dynamic World Transforming Institutions, Growth, and Quality of Life. New York, NY: World Bank and Oxford University Press, Inc.
- Yang, Philipp Q. 1995. Post-1965 Immigration to the United States: Structural Determinants. Westport, CT: Greenwood Publishing Group, Inc.
- Yoon, B.S.L. 1992. "Reverse Brain Drain in South Korea: State-led Model", Studies in Comparative International Development, 27(1), pp. 4-26.
- Zahlan, A.B. 1977. "The Brain Drain Controversy," The Proceedings of the International population Conference, pp.319-327.
- Zelinsky, W. 1971. "The Hypothesis of the Mobility Transition," Geographical Review 42 (2): 219-249
- Zolberg, Aristide. 1981. "International Migration in Political Perspective." In Global Trends in Migration: Theory and Research on International Population Movements, edited by Mary M. Kritz, Charles B. Keeley, and Silvano M. Tomasi, pp. 3-27. New York: Center for Migration Studies.

## APPENDIXES

## APPENDIX A

Table 1. The List Of All World Countries In 1990

Afghanistan	C. African Rep.	Gambia	Liberia	N.Mariana.Is	St.Lucia
Albania	Chad	Georgia	Libya	Norway	St.V.Grenad.
Algeria	Chile	Germany	Liechtenstein	Oman	Sudan
A. Samoa	China	Ghana	Lithuania	Pacific I.T.T	Suriname
Andorra	Chr. Island	Gibraltar	Luxembourg	Pakistan	Swaziland
Angola	Coc. Islands	Greece	Macao	Palau	Sweden
Anguilla	Colombia	Greenland	Macedonia	Panama	Switzerland
A. Barbuda	Comoros	Grenada	Madagascar.	P.N. Guinea	Syria
Argentina	Congo	Guadeloupe	Malawi	Paraguay	Taiwan
Armenia	Congo Dem.	Guatemala	Malaysia	Peru	Tajikistan
Aruba	Cook Isl.	Guinea	Maldives	Philippines	Tanzania
Australia	Costa Rica	G. Bissau	Mali	Poland	Thailand
Austria	Coted I'voire	Guyana	Malta	Portugal	Togo
Azerbaijan	Croatia	Haiti	Marshall Isl.	Puerto Rico	Tonga
Bahamas	Cuba	Honduras	Martinique	Qatar	T. Tobago
Bahrain	Cyprus	Hong Kong	Mauritania	Romania	Tunisia
Bangladesh	Czech Rep.	Hungary	Mauritius	Russia	Turkey
Barbados	Czechoslovakia	Iceland	Mexico	Rwanda	Turkmenistan
Belarus	Denmark	India	Micronesia F.	S.Korea	Turks Isl.
Belgium	Djibouti	Indonesia	Moldova	Samoa	Tuvalu
Belize	Dominica	Iran	Monaco	S.Mariono	US Virgin Is.
Benin	Domin Rep.	Iraq	Mongolia	Sao T.P.	Uganda
Bermuda	Ecuador	Ireland	Montserrat	Saudi Arabia	Ukraine
Bhutan	Egypt	Israel	Morocco	Senegal	U. Arab Em..
Bolivia	El Salvador	Italy	Mozambique	Seychelles	U.K
Bosnia	Eq. Guinea	Jamaica	Myanmar	S. Leone	U.S.
Botswana	Eritrea	Japan	N.Korea	Singapore	Uruguay
Brazil	Estonia	Jordan	Namibia	Slovak Rep.	Uzbekistan
B.V. Islands	Ethiopia	Kazakhstan	Nauru	Slovenia	Vanuatu
Brunei	Falkland Isl.	Kenya	Nepal	Solomon Isl.	Venezuela
Bulgaria	Fiji	Kiribati	Netherlands	Somalia	Viet Nam
B. Faso	Finland	Kuwait	N.Antilles	S. Africa	W. Sahara
Burundi	France	Kyrgyzstan	N.Caledonia	Soviet Union	Yemen
Cambodia	F.Guiana	Laos	New Zealand	Spain	Yugoslavia
Cameroon	F.Polynesia	Latvia	Nicaragua	Sri Lanka	Zambia
Canada	Gabon	Lebanon	Niger	St. Helena	Zimbabwe
Cape Verde	Cayman Isl.	Lesotho	Nigeria	St.Kitts N.	

Source: U.S. Immigration and Naturalization Service (Ins) 2002 and U.N. Population Division 2002.

Table 2: All World Countries 2000

Afghanistan	Comoros	Hungary	Mozambique	*Soviet Union
Albania	Congo	Iceland	Myanmar	Spain
Algeria	Congo Dem.	India	N.Korea	Sri Lanka
A. Samoa	Cook Isl.	Indonesia	Namibia	St. Helena
Andorra	Costa Rica	Iran	Nauru	St.Kitts N.
Angola	Coted I'voire	Iraq	Nepal	St.Lucia
Anguilla	Croatia	Ireland	Netherlands	St.V.Grenad.
A. Barbuda	Cuba	Israel	N.Antilles	Sudan
Argentina	Cyprus	Italy	N.Caledonia	Suriname
Armenia	Czech Rep.	Jamaica	New Zealand	Swaziland
Aruba	*Czechoslovakia	Japan	Nicaragua	Sweden
Australia	Denmark	Jordan	Niger	Switzerland
Austria	Djibouti	Kazakhstan	Nigeria	Syria
Azerbaijan	Dominica	Kenya	N.Mariana.Is	Taiwan
Bahamas	Domin Rep.	Kiribati	Norway	Tajikistan
Bahrain	Ecuador	Kuwait	Oman	Tanzania
Bangladesh	Egypt	Kyrgyzstan	Pacific I.T.T	Thailand
Barbados	El Salvador	Laos	Pakistan	Togo
Belarus	Eq. Guinea	Latvia	Palau	Tonga
Belgium	Eritrea	Lebanon	Panama	T. Tobago
Belize	Estonia	Lesotho	P.N. Guinea	Tunisia
Benin	Ethiopia	Liberia	Paraguay	Turkey
Bermuda	Falkland Isl.	Libya	Peru	Turkmenistan
Bhutan	Fiji	Liechtenstein	Philippines	Turks Isl.
Bolivia	Finland	Lithuania	Poland	Tuvalu
Bosnia	France	Luxembourg	Portugal	US Virgin Is.
Botswana	F.Guiana	Macao	Puerto Rico	Uganda
Brazil	F.Polynesia	Macedonia	Qatar	Ukraine
B.V. Islands	Gabon	Madagascar	Romania	U. Arab Em..
Brunei	Gambia	Malawi	Russia	U.K
Bulgaria	Georgia	Malaysia	Rwanda	U.S.
B. Faso	Germany	Maldives	S.Korea	Uruguay
Burundi	Ghana	Mali	Samoa	Uzbekistan
Cambodia	Gibraltar	Malta	S.Mariono	Vanuatu
Cameroon	Greece	Marshall Isl.	Sao T.P.	Venezuela
Canada	Greenland	Martinique	Saudi Arabia	Viet Nam
Cape Verde	Grenada	Mauritania	Senegal	W. Sahara
Cayman Isl.	Guadeloupe	Mauritius	Seychelles	Yemen
C. African Rep.	Guatemala	Mexico	S. Leone	Yugoslavia
Chad	Guinea	Micronesia F.	Singapore	Zambia
Chile	G. Bissau	Moldova	Slovak Rep.	Zimbabwe
China	Guyana	Monaco	Slovenia	
Chr. Island	Haiti	Mongolia	Solomon Isl.	
Coc. Islands	Honduras	Montserrat	Somalia	
Colombia	Hong Kong	Morocco	S. Africa	

Source: U.S. Immigration And Naturalization Service (Ins) 2002 And U.N. Population Division 2002.

\*Refers to unknown republics.

## APPENDIX B

**Table 1: The List Of All World Countries Based On Regional Category By 1990 And 2000**

1. Europe 1990		1. Europe 2000		2. Asia 1990		2. Asia 2000	
Albania	Moldova	Albania	Moldova	Afghanistan	S.Korea	Afghanistan	S.Korea
Andorra	Monaco	Andorra	Monaco	Bahrain	Saudi Arabia	Bahrain	Saudi Arabia
Armenia	Netherlands	Armenia	Netherlands	Bangladesh	Singapore	Bangladesh	Singapore
Austria	Norway	Austria	Norway	Bhutan	Sri Lanka	Bhutan	Sri Lanka
Azerbaijan	Poland	Azerbaijan	Poland	Brunei	Syria	Brunei	Syria
Belarus	Portugal	Belarus	Portugal	Cambodia	Taiwan	Cambodia	Taiwan
Belgium	Romania	Belgium	Romania	China	Thailand	China	Thailand
Bosnia	Russia	Bosnia	Russia	Chr. Island	Turkey	Chr. Island	Turkey
Bulgaria	S.Mariono	Bulgaria	S.Mariono	Coc. Islands	U. Arab Em..	Coc. Islands	U. Arab Em..
Croatia	Slovak Rep.	Croatia	Slovak Rep.	Cyprus	Viet Nam	Cyprus	Viet Nam
Czech Rep.	Slovenia	Czech Rep.	Slovenia	Hong Kong	Yemen	Hong Kong	Yemen
Czechoslovk.	Soviet Union	*Czechoslovk.	*Soviet Union	India		India	
Denmark	Spain	Denmark	Spain	Indonesia		Indonesia	
Estonia	Sweden	Estonia	Sweden	Iran		Iran	
Finland	Switzerland	Finland	Switzerland	Iraq		Iraq	
France	Tajikistan	France	Tajikistan	Israel		Israel	
Georgia	Turkmenistan	Georgia	Turkmenistan	Japan		Japan	
Germany	Ukraine	Germany	Ukraine	Jordan		Jordan	
Gibraltar	U.K	Gibraltar	U.K	Kuwait		Kuwait	
Greece	Uzbekistan	Greece	Uzbekistan	Laos		Laos	
Hungary	Yugoslavia	Hungary	Yugoslavia	Lebanon		Lebanon	
Iceland		Iceland		Macao		Macao	
Ireland		Ireland		Malaysia		Malaysia	
Italy		Italy		Maldives		Maldives	
Kazakhstan		Kazakhstan		Mongolia		Mongolia	
Kyrgyzstan		Kyrgyzstan		Myanmar		Myanmar	
Latvia		Latvia		N.Korea		N.Korea	
Liechtenstein		Liechtenstein		Nepal		Nepal	
Lithuania		Lithuania		Oman		Oman	
Luxembourg		Luxembourg		Pakistan		Pakistan	
Macedonia		Macedonia		Philippines		Philippines	
Malta		Malta		Qatar		Qatar	

Source: United Nation Development Programme 1991 And 2002 U.S. Immigration and Naturalization Service. (INS) 2002 and U.N. Population Division 2002.

\*Refers to unknown republics.

Table 2: The List Of All World Countries Based On Regional Category by 1990 and 2000

3. Africa				4. Oceania	
1990		2000		1990	2000
Algeria	Niger	Algeria	Niger	A. Samoa	A. Samoa
Angola	Nigeria	Angola	Nigeria	Australia	Australia
Benin	Rwanda	Benin	Rwanda	Cook Isl.	Cook Isl.
Botswana	Sao T.P.	Botswana	Sao T.P.	Fiji	Fiji
B. Faso	Senegal	B. Faso	Senegal	F.Polynesia	F.Polynesia
Burundi	Seychelles	Burundi	Seychelles	Kiribati	Kiribati
Cameroon	S. Leone	Cameroon	S. Leone	Marsahl Isl.	Marsahl Isl.
Cape Verde	Somalia	Cape Verde	Somalia	Micronesia F.	Micronesia F.
C. African Rep.	S. Africa	C. African Rep.	S. Africa	Nauru	Nauru
Chad	St. Helena	Chad	St. Helena	N.Caledonia	N.Caledonia
Comoros	Sudan	Comoros	Sudan	New Zealand	New Zealand
Congo	Swaziland	Congo	Swaziland	N.Mariana.Is	N.Mariana.Is
Congo Dem.	Tanzania	Congo Dem.	Tanzania	Pacific I.T.T	Pacific I.T.T
CotedIvoire	Togo	CotedIvoire	Togo	Palau	Palau
Djibouti	Tunisia	Djibouti	Tunisia	P.N. Guinea	P.N. Guinea
Egypt	Uganda	Egypt	Uganda	Samoa	Samoa
Eq. Guinea	W. Sahara	Eq. Guinea	W. Sahara	Solomon Isl.	Solomon Isl.
Eritrea	Zambia	Eritrea	Zambia	Tonga	Tonga
Ethiopia	Zimbabwe	Ethiopia	Zimbabwe	Tuvalu	Tuvalu
Gabon		Gabon		Vanuatu	Vanuatu
Gambia		Gambia			
Ghana		Ghana			
Guinea		Guinea			
G. Bissau		G. Bissau			
Kenya		Kenya			
Lesotho		Lesotho			
Liberia		Liberia			
Libya		Libya			
Madagascar		Madagascar			
Malawi		Malawi			
Mali		Mali			
Mauritania		Mauritania			
Mauritius		Mauritius			
Morocco		Morocco			
Mozambique		Mozambique			
Namibia		Namibia			

Source: United Nation Development Programme 1991 and 2002 U.S. Immigration and Naturalization Service (Ins) 2002, and U.N. Population Division 2002.

Table 3: The List Of All World Countries Based On Regional Category by 1990 And 2000

5. North America		6. South America	
1990	2000	1990	2000
Anguilla	Anguilla	Argentina	Argentina
A. Barbuda	A. Barbuda	Bolivia	Bolivia
Aruba	Aruba	Brazil	Brazil
Bahamas	Bahamas	Chile	Chile
Barbados	Barbados	Colombia	Colombia
Belize	Belize	Ecuador	Ecuador
Bermuda	Bermuda	Falkland Isl.	Falkland Isl.
B.V. Islands	B.V. Islands	F.Guiana	F.Guiana
Canada	Canada	Guyana	Guyana
Cayman Isl.	Cayman Isl.	Paraguay	Paraguay
Costa Rica	Costa Rica	Peru	Peru
Cuba	Cuba	Suriname	Suriname
Dominica	Dominica	Uruguay	Uruguay
Domin Rep.	Domin Rep.	Venezuela	Venezuela
El Salvador	El Salvador		
Greenland	Greenland		
Grenada	Grenada		
Guadeloupe	Guadeloupe		
Guatemala	Guatemala		
Haiti	Haiti		
Honduras	Honduras		
Jamaica	Jamaica		
Martinique	Martinique		
Mexico	Mexico		
Montserrat	Montserrat		
N.Antilles	N.Antilles		
Nicaragua	Nicaragua		
Panama	Panama		
Puerto Rico	Puerto Rico		
St.Kitts N.	St.Kitts N.		
St.Lucia	St.Lucia		
St.V.Grenad.	St.V.Grenad.		
T. Tobago	T. Tobago		
Turks Isl.	Turks Isl.		
US Virgin Is.	US Virgin Is.		
U.S.	U.S.		

Source: United Nation Development Programme 1991 and 2002 U.S. Immigration and Naturalization Service (INS) 2002 and U.N. Population Division 2002.

## APPENDIX C

**Table 1: Low Human Development Index Group  
Based On Human Development Index Classifications Of The World Countries By Year**

1990		2000	
Afghanistan	Laos	Afghanistan	S. Leone
Algeria	Lesotho	Angola	Somalia
Angola	Liberia	Bangladesh	Sudan
Bangladesh	Madagascar	Benin	Tanzania
Benin	Malawi	Bhutan	Togo
Bhutan	Mali	B. Faso	Tuvalu
Bolivia	Mauritania	Burundi	Uganda
B. Faso	Morocco	C. African Rep.	Yemen
Burundi	Mozambique	Chad	Zambia
Cambodia	Myanmar	Congo Dem.	
Cameroon	Namibia	CotedIvoire	
Cape Verde	Nepal	Djibouti	
C. African Rep.	Niger	Eritrea	
Chad	Nigeria	Ethiopia	
Comoros	Pakistan	Gambia	
Congo	P.N. Guinea	Guinea	
Congo Dem.	Rwanda	G. Bissau	
CotedIvoire	Sao T.P.	Haiti	
Djibouti	Senegal	Kiribati	
Egypt	S. Leone	Laos	
Eq. Guinea	Solomon Isl.	Liberia	
Ethiopia	Somalia	Madagascar	
Gambia	Sudan	Malawi	
Ghana	Swaziland	Mali	
Guatemala	Tanzania	Mauritania	
Guinea	Togo	Mozambique	
G. Bissau	Uganda	Nepal	
Haiti	Viet Nam	Niger	
Honduras	Yemen	Nigeria	
India	Zambia	Pakistan	
Indonesia	Zimbabwe	Rwanda	
Kenya		Senegal	

Source: United Nation Development Programme 1991, 1992, 1993 And 2002.



Table 2: Medium Human Development Index Group Of The World Countries  
by Year

1990		2000		
Azerbaijan	S. Africa	B.V. Islands	F.Polynesia	Nicaragua
Belize	Sri Lanka	Sao T.P.	Gabon	N.Korea
Botswana	St.Kitts N.	St.Kitts.N	Georgia	N.Mariana.Is
Brazil	St.Lucia	St.V.Grenad.	Ghana	Oman
China	St.V.Grenad.	Turks Islands	Grenada	Palau
Colombia	Suriname	US Virgin Is	Guadeloupe	Panama
Cuba	Syria	Albania	Guatemala	P.N. Guinea
Domin Rep.	Tajikistan	Algeria	Guyana	Paraguay
Ecuador	Thailand	A. Samoa	Honduras	Peru
El Salvador	Tunisia	Anguilla	India	Philippines
Fiji	Turkey	Armenia	Indonesia	Puerto Rico
Gabon	Turkmenistan	Aruba	Iran	Romania
Grenada	U. Arab Em..	Azerbaijan	Iraq	Russia
Guyana	Uzbekistan	Belarus	Jamaica	Samoa
Iran	Vanuatu	Belize	Jordan	Saudi Arabia
Iraq		Bolivia	Kazakhstan	Solomon Isl.
Jamaica		Botswana	Kenya	S. Africa
Jordan		Brazil	Kyrgyzstan	Sri Lanka
Kyrgyzstan		Bulgaria	Lebanon	St. Helena
Lebanon		Cambodia	Lesotho	St.Lucia
Libya		Cameroon	Libya	Suriname
Maldives		Cape Verde	Macedonia	Swaziland
Mauritius		Cayman Isl.	Malaysia	Syria
Moldova		China	Maldives	Tajikistan
Mongolia		Colombia	Marsahl Isl.	Thailand
Nicaragua		Comoros	Martinique	Tonga
N.Korea		Congo	Mauritius	Tunisia
Oman		Cook Isl.	Mexico	Turkey
Panama		Cuba	Micronesia F.	Turkmenistan
Paraguay		Dominica	Moldova	Ukraine
Peru		Domin Rep.	Mongolia	Uzbekistan
Philippines		Ecuador	Montserrat	Vanuatu
Romania		Egypt	Morocco	Venezuela
Samoa		El Salvador	Myanmar	Viet Nam
Saudi Arabia		Eq. Guinea	Namibia	W. Sahara
Seychelles		Falkland Isl.	N.Antilles	Zimbabwe
		Fiji	Nauru	
		F.Guiana	N.Caledonia	

Source: United Nation Development Programme 1991, 1992, 1993 and 2002.

Table 3: High Human Development Index

1990		2000	
Albania	Italy	T. Tobago	Japan
Andorra	Japan	U. Arab Em..	Kuwait
A. Barbuda	Kazakhstan	U.K	Latvia
Argentina	Kuwait	U.S.	Liechtenstein
Armenia	Latvia	Yugoslavia	Lithuania
Australia	Liechtenstein	Andorra	Luxembourg
Austria	Lithuania	A. Barbuda	Malta
Bahamas	Luxembourg	Argentina	Monaco
Bahrain	Macedonia	Australia	Netherlands
Barbados	Malaysia	Austria	New Zealand
Belarus	Malta	Bahamas	Norway
Belgium	Mexico	Bahrain	Poland
Bermuda	Monaco	Barbados	Portugal
Bosnia	Netherlands	Belgium	Qatar
Brunei	New Zealand	Bermuda	S.Mariono
Bulgaria	Norway	Bosnia	Seychelles
Canada	Poland	Brunei	Singapore
Chile	Portugal	Canada	S.Korea
Costa Rica	Qatar	Chile	Slovak Rep.
Croatia	Russia	Costa Rica	Slovenia
Cyprus	S.Mariono	Croatia	Spain
Czechoslovakia	Singapore	Cyprus	Sweden
Czech Rep.	S.Korea	Czech Rep.	Switzerland
Denmark	Slovak Rep.	Denmark	Taiwan
Dominica	Slovenia	Estonia	Uruguay
Estonia	Soviet Union	Finland	
Finland	Spain	France	
France	Sweden	Germany	
Georgia	Switzerland	Gibraltar	
Germany	Taiwan	Greece	
Gibraltar	T. Tobago	Greenland	
Greece	U.K	Hong Kong	
Greenland	Ukraine	Hungary	
Hong Kong	Uruguay	Iceland	
Hungary	U.S.	Ireland	
Iceland	Venezuela	Israel	
Ireland	Yugoslavia	Italy	
Israel			

Source: United Nation Development Programme 1991, 1992, 1993 And 2002.

## APPENDIX D

Table 1: The List Of All World Countries Based On Income Category In 1990

1. Low Income		2. Medium Income		3. High Income		
Afghanistan	Rwanda	Albania	Malaysia	Vanuatu	Andorra	Barbados
Bangladesh	Sao T.P.	Armenia	Mongolia	A. Barbuda	Austria	Bermuda
Bhutan	S. Leone	Azerbaijan	N.Korea	Belize	Belgium	Canada
Cambodia	Sudan	Belarus	Oman	Costa Rica	Denmark	Greenland
China	Tanzania	Bosnia	Philippines	Cuba	Finland	U.S.
India	Togo	Bulgaria	S.Korea	Dominica		Unknown
Laos	Uganda	Croatia	Syria	Domin Rep.	Germany	Chr Island
Maldives	Zambia	Czech Rep.	Thailand	El Salvador	Gibraltar	Coc. Islands
Myanmar	Kiribati	Czechoslovakia	Turkey	Grenada	Greece	Macao
Nepal	Haiti	Estonia	Yemen	Guatemala	Iceland	St. Helena
Pakistan	Guyana	Georgia	Algeria	Honduras	Ireland	W. Sahara
Sri Lanka		Hungary	Angola	Jamaica	Italy	A. Samoa
Viet Nam		Kazakhstan	Botswana	Mexico	Luxembourg	Cook Isl.
Benin		Kyrgyzstan	Cameroon	Nicaragua	Malta	F.Polynesia
B. Faso		Latvia	Cape Verde	Panama	Monaco	Marsahl Isl.
Burundi		Liechtenstein	Congo	St.Kitts N.	Netherlands	Micronesia F.
C. African Rep.		Lithuania	Coted I'voire	St.Lucia	Norway	Nauru
Chad		Macedonia	Djibouti	St.V.Grenad.	S.Mariono	N.Caledonia
Comoros		Moldova	Egypt	T. Tobago	Spain	N.Mariana.Is
Congo Dem.		Poland	Gabon	Argentina	Sweden	Pacific I.T.T
Eq. Guinea		Portugal	Lesotho	Bolivia	Switzerland	Palau
Eritrea		Romania	Libya	Brazil	U.K	Tonga
Ethiopia		Russia	Mauritius	Chile	Bahrain	Tuvalu
Gambia		Slovak Rep.	Morocco	Colombia	Brunei	Anguilla
Ghana		Slovenia	Namibia	Ecuador	Cyprus	Aruba
Guinea		Soviet Union	Senegal	Paraguay	Hong Kong	B.V. Islands
G. Bissau		Tajikistan	Seychelles	Peru	Israel	Cayman Isl.
Kenya		Turkmenistan	Somalia	Suriname	Japan	Guadeloupe
Liberia		Ukraine	S. Africa	Uruguay	Kuwait	Martinique
Madagascar		Uzbekistan	Swaziland	Venezuela	Qatar	Montserrat
Malawi		Yugoslavia	Tunisia		Saudi Arabia	N.Antilles
Mali		Indonesia	Zimbabwe		Singapore	Puerto Rico
Mauritania		Iran	Fiji		Taiwan	Turks Isl.
Mozambique		Iraq	P.N. Guinea		U. Arab Em..	US Virgin Is.
Niger		Jordan	Samoa		Australia	Falkland Isl.
Nigeria		Lebanon	Solomon Isl.		New Zealand	F.Guiana
					Bahamas	

Source: United Nation Development Programme 1991, 1992, 1993, and 2002.

Table 2: The List Of All World Countries Based On Income Category in 2000

1. Low Income		2. Medium Income		3. High Income		
Armenia	Lesotho	Albania	Egypt	Grenada	Andorra	New Zealand
Azerbaijan	Liberia	Belarus	Eq. Guinea	Guadeloupe	Austria	Bahamas
Georgia	Madagascar	Bulgaria	Gabon	Guatemala	Belgium	Barbados
Kyrgyzstan	Malawi	Croatia	Libya	Honduras	Bosnia	Bermuda
Moldova	Mali	Czech Rep.	Mauritius	Jamaica	Denmark	Canada
Tajikistan	Mauritania	Estonia	Morocco	Martinique	Finland	Greenland
Ukraine	Mozambique	Hungary	Namibia	Mexico	France	U.S.
Uzbekistan	Niger	Kazakhstan	Seychelles	Montserrat	Germany	
Afghanistan	Nigeria	Latvia	S. Africa	N.Antilles	Gibraltar	Unknown
Bangladesh	Rwanda	Lithuania	St. Helena	Panama	Greece	*Czechos
Bhutan	Sao T.P.	Macedonia	Swaziland	Puerto Rico	Iceland	*Soviet Union
India	Senegal	Poland	Tunisia	St.Kitts N.	Ireland	Chr. Island
Indonesia	S. Leone	Romania	W. Sahara	St.Lucia	Italy	Coc. Islands
Laos	Somalia	Russia	A. Samoa	St.V.Grenad.	Liechtenstein	Macao
Mongolia	Sudan	Slovak Rep.	Cook Isl.	T. Tobago	Luxembourg	Pacific I.T.T
Myanmar	Tanzania	Turkmenistan	Fiji	Turks Isl.	Malta	
Nepal	Togo	Bahrain	F.Polynesia	US Virgin Is.	Monaco	
Pakistan	Uganda	Cambodia	Marsahl Isl.	Argentina	Netherlands	
Viet Nam	Zambia	China	Micronesia F.	Bolivia	Norway	
Yemen	Zimbabwe	Iran	Nauru	Brazil	Portugal	
Angola	Kiribati	Iraq	N.Caledonia	Chile	S.Mariono	
Benin	Solomon Isl.	Jordan	N.Mariana.Is	Colombia	Slovenia	
B. Faso	Tuvalu	Lebanon	Palau	Ecuador	Spain	
Burundi	Haiti	Malaysia	P.N. Guinea	Falkland Isl.	Sweden	
Cameroon	Nicaragua	Maldives	Samoa	F.Guiana	Switzerland	
C.African Rep.		N.Korea	Tonga	Guyana	U.K	
Chad		Oman	Vanuatu	Paraguay	Yugoslavia	
Comoros		Philippines	Anguilla	Peru	Brunei	
Congo		S.Korea	A. Barbuda	Suriname	Cyprus	
Congo Dem.		Saudi Arabia	Aruba	Uruguay	Hong Kong	
Coted I'voire		Sri Lanka	Belize	Venezuela	Israel	
Eritrea		Syria	B.V. Islands		Japan	
Ethiopia		Thailand	Cayman Isl.		Kuwait	
Gambia		Turkey	Costa Rica		Qatar	
Ghana		Algeria	Cuba		Singapore	
Guinea		Botswana	Dominica		Taiwan	
G. Bissau		Cape Verde	Domin Rep.		U. Arab Em..	
Kenya		Djibouti	El Salvador		Australia	

Source: United Nation Development Programme 1991, 1992, 1993 and 2002.

\* Refers to unknown republics.

## APPENDIX E

**Table 1: The List of All World Countries Based on Development Level Category in 1990**

1. Least Developed Countries					4. E. Europe & Former USSR Countries		
2. Developing Countries					3. Industrial Countries		
					Unknown		
Afghanistan	Rwanda	Bahrain	Congo	Guatemala	Andorra	Albania	Chr. Island
Bangladesh	Sao T.P.	Brunei	Coted I'voi.	Honduras	Austria	Armenia	Coc. Islands
Bhutan	S. Leone	China	Egypt	Jamaica	Belgium	Azerbaijan	Macao
Cambodia	Somalia	Cyprus	Gabon	Mexico	Denmark	Belarus	St. Helena
Laos	Sudan	Hong Kong	Ghana	Nicaragua	Finland	Bosnia	W. Sahara
Maldives	Tanzania	India	Kenya	Panama	France	Bulgaria	A. Samoa
Myanmar	Togo	Indonesia	Libya	St.Lucia	Germany	Croatia	Cook Isl.
Nepal	Uganda	Iran	Madagascar	St.V.Grenad.	Gibraltar	Czech Rep.	F.Polynesia
Yemen	Zambia	Iraq	Mali	T. Tobago	Greece	*Czechoslovak.	Marsahl Isl.
Benin	Kiribati	Jordan	Mauritius	Argentina	Iceland	Estonia	Micronesia F.
Botswana	Samoa	Kuwait	Morocco	Bolivia	Ireland	Georgia	Nauru
B. Faso	Solomon Is.	Lebanon	Namibia	Brazil	Italy	Hungary	N.Caledonia
Burundi	Vanuatu	Malaysia	Nigeria	Chile	Luxembourg	Kazakhstan	N.Mariana.Is
Cape Verde	Haiti	Mongolia	Senegal	Colombia	Malta	Kyrgyzstan	Pacific I.T.T
C. African Rep.		N.Korea	Seychelles	Ecuador	Monaco	Latvia	Palau
Chad		Oman	S. Africa	Guyana	Netherlands	Liechtenstein	Tonga
Comoros		Pakistan	Swaziland	Paraguay	Norway	Lithuania	Tuvalu
Congo Dem.		Philippines	Tunisia	Peru	Portugal	Macedonia	Anguilla
Djibouti		Qatar	Zimbabwe	Suriname	S.Mariono	Moldova	Aruba
Eq. Guinea		S.Korea	Fiji	Uruguay	Spain	Poland	B.V. Islands
Eritrea		SaudiArabia	P.N.Guinea	Venezuela	Sweden	Romania	Cayman Isl.
Ethiopia		Singapore	A. Barbuda		Switzerland	Russia	Guadeloupe
Gambia		Sri Lanka	Bahamas		U.K	Slovak Rep.	Martinique
Guinea		Syria	Barbados		Israel	Slovenia	Montserrat
G. Bissau		Thailand	Belize		Japan	* Soviet Union	N.Antilles
Lesotho		Turkey	Costa Rica		Taiwan	Tajikistan	Puerto Rico
Liberia		U. Arab Em.	Cuba		Australia	Turkmenistan	St.Kitts N.
Malawi		Viet Nam	Dominica		New Zealand	Ukraine	Turks Isl.
Mauritania		Algeria	Domin Rep		Bermuda	Uzbekistan	US Virgin Is.
Mozambique		Angola	El Salvador		Canada	Yugoslavia	Falkland Isl.
Niger		Cameroon	Grenada		Greenland		F.Guiana
					U.S.		

Source: United Nation Development Programme 1991, 1992, 1993 and 2002.

\*Refers to unknown republics.

Table 2: The List of All World Countries Based on Development Level Category  
in 2000

1. Least Developed					2. Developing Countries		3. Industrial Countries		4. E. Europe & Former USSR	
Afghanistan	Sudan	Algeria	Guatemala	Philippines	Andorra	Albania				
Bangladesh	Tanzania	A. Samoa	Guyana	Puerto Rico	Austria	Armenia				
Bhutan	Togo	Anguilla	Honduras	Qatar	Belgium	Azerbaijan				
Cambodia	Uganda	A. Barbuda	Hong Kong	Saudi Arabia	Denmark	Belarus				
Laos	Zambia	Argentina	India	Seychelles	Finland	Bosnia				
Maldives	Kiribati	Aruba	Indonesia	S.Korea	France	Bulgaria				
Myanmar	Samoa	Bahamas	Iran	S. Africa	Germany	Croatia				
Nepal	Solomon Isl.	Bahrain	Iraq	Sri Lanka	Gibraltar	Czech Rep.				
Yemen	Tuvalu	Barbados	Jamaica	St. Helena	Greece	*Czechoslovak				
Angola	Vanuatu	Belize	Jordan	St.Lucia	Iceland	Estonia				
Benin	Haiti	Bolivia	Kenya	Suriname	Ireland	Georgia				
B. Faso		Botswana	Kuwait	Swaziland	Italy	Hungary				
Burundi		Brazil	Lebanon	Syria	Luxembourg	Kazakhstan				
Cape Verde		Brunei	Libya	Thailand	Malta	Kyrgyzstan				
C. African Rep.		Cameroon	Malaysia	Tonga	Monaco	Latvia				
Chad		Cayman Isl.	Marsahl Isl.	Tunisia	Netherlands	Liechtenstein				
Comoros		Chile	Martinique	Turkey	Norway	Lithuania				
Congo Dem.		China	Mauritius	Uruguay	Portugal	Macedonia				
Djibouti		Colombia	Mexico	Venezuela	S.Mariono	Moldova				
Eq. Guinea		Congo	Micronesia F.	Viet Nam	Spain	Poland				
Eritrea		Cook Isl.	Mongolia	W. Sahara	Sweden	Romania				
Ethiopia		Costa Rica	Montserrat	Zimbabwe	Switzerland	Russia				
Gambia		Coted Ivoire	Morocco	B.V. Islands	U.K	Slovak Rep.				
Guinea		Cuba	Namibia	St.Kitts N.	Israel	Slovenia				
G. Bissau		Cyprus	N.Antilles	St.V.Grenad.	Japan	*Soviet Union				
Lesotho		Dominica	Nauru	T. Tobago	Singapore	Tajikistan				
Liberia		Domin Rep.	N.Caledonia	Turks Isl.	Taiwan	Turkmenistan				
Madagascar		Ecuador	Nicaragua	U. Arab Em..	Australia	Ukraine				
Malawi		Egypt	Nigeria	US Virgin Is.	New Zealand	Uzbekistan				
Mali		El Salvador	N.Korea		Bermuda	Yugoslavia				
Mauritania		Falkland Isl.	N.Mariana.Is		Canada					
Mozambique		Fiji	Oman		Greenland	Unknown				
Niger		F.Guiana	Pakistan		U.S.	Chr. Island				
Rwanda		F.Polynesia	Palau			Coc. Islands				
Sao T.P.		Gabon	Panama			Macao				
Senegal		Ghana	P.N. Guinea			Pacific I.T.T				
S. Leone		Grenada	Paraguay							
Somalia		Guadeloupe	Peru							

Source: United Nation Development Programme 1991, 1992, 1993 and 2002.

\*Refers to unknown republics.

# APPENDIX F

Table 1: The List of All World Countries Based on Regional Industrial Aggregates 1990

1. Sub-Saharan Africa		2. Arab States	3. Latin America & Caribbean		4. Asia & Pacific		5. OECD Countries	6. Eastern Euro & Former USSR Countries.		7. Other
Angola	Liberia	Bahrain	Anguilla	Panama	Afghanistan	Thailand	Austria	Albania	Soviet Union	Andorra
Benin	Madagascar	Iraq	A. Barbuda	Puerto Rico	Bangladesh	Viet Nam	Belgium	Armenia	Tajikistan	Gibraltar
Botswana	Malawi	Jordan	Aruba	St.Kitts N.	Bhutan	A. Samoa	Denmark	Azerbaijan	Turkmenistan	Malta
B. Faso	Mali	Kuwait	Bahamas	St.Lucia	Brunei	Cook Isl.	Finland	Belarus	Ukraine	Monaco
Burundi	Mauritania	Lebanon	Barbados	St.V.Grenad.	Cambodia	Fiji	France	Bosnia	Uzbekistan	S.Mariono
Cameroon	Mauritius	Oman	Belize	T. Tobago	China	F.Polynesia	Germany	Bulgaria	Yugoslavia	Cyprus
Cape Verde	Mozambique	Qatar	B.V. Islands	Turks Isl.	Hong Kong	Kiribati	Greece	Croatia		Israel
C. African Rep.	Namibia	Saudi Arabia	Cayman Isl.	US Virgin Is.	India	Marsahl Isl.	Iceland	Czech Rep.		Turkey
Chad	Niger	Syria	Costa Rica	Argentina	Indonesia	Micronesia F.	Ireland	Czechoslovak		W. Sahara
Comoros	Nigeria	U. Arab Em.	Cuba	Bolivia	Iran	Nauru	Italy	Estonia		Bermuda
Congo	Rwanda	Yemen	Dominica	Brazil	Laos	N.Caledonia	Luxembourg	Georgia		Greenland
Congo Dem.	Sao T.P.	Algeria	Domin Rep.	Chile	Macao	N.Mariana.Is	Netherlands	Hungary		
Coted I'voire	Senegal	Egypt	El Salvador	Colombia	Malaysia	Pacific I.T.T	Norway	Kazakhstan		
Djibouti	Seychelles	Libya	Grenada	Ecuador	Maldives	Palau	Portugal	Kyrgyzstan		
Eq. Guinea	S. Leone	Morocco	Guadeloupe	Falkland Isl.	Mongolia	P.N. Guinea	Spain	Latvia		
Eritrea	Somalia	Sudan	Guatemala	F.Guiana	Myanmar	Samoa	Sweden	Liechtenstein		
Ethiopia	S. Africa	Tunisia	Haiti	Guyana	N.Korea	Solomon Isl.	Switzerland	Lithuania		
Gabon	St. Helena		Honduras	Paraguay	Nepal	Tonga	U.K	Macedonia		
Gambia	Swaziland		Jamaica	Peru	Pakistan	Tuvalu	Japan	Moldova		
Ghana	Tanzania		Martinique	Suriname	Philippines	Vanuatu	Australia	Poland		
Guinea	Togo		Mexico	Uruguay	S.Korea		New Zealand	Romania		
G. Bissau	Uganda		Montserrat	Venezuela	Singapore		Canada	Russia		
Kenya	Zambia		N.Antilles		Sri Lanka		U.S.	Slovak Rep.		
Lesotho	Zimbabwe		Nicaragua		Taiwan			Slovenia		

Source: United Nation Development Programme 1991, 1992, 1993 and 2002 and U.N. Population Division 2002.

Table 2: The List of All World Countries Based on Regional &amp; Industrial Aggregate 2000

1 Sub-Saharan Africa		2. Arab States	3. Latin America & Caribbean		4. Asia & Pacific		5. OECD Countries	6. Eastern Europe & Former USSR Countries		7. Other
Angola	Mali	Bahrain	Anguilla	St.Kitts N.	Afghanistan	A. Samoa	Austria	Albania	Yugoslavia	Andorra
Benin	Mauritania	Iraq	A. Barbuda	St.Lucia	Bangladesh	Cook Isl.	Belgium	Armenia	Turkmenistan	Gibraltar
Botswana	Mauritius	Jordan	Aruba	St.V.Grenad.	Bhutan	Fiji	Denmark	Azerbaijan	Uzbekistan	Malta
B. Faso	Mozambique	Kuwait	Bahamas	T. Tobago	Brunei	F.Polynesia	Finland	Belarus	Ukraine	S.Mariono
Burundi	Namibia	Lebanon	Barbados	Turks Isl.	Cambodia	Kiribati	France	Bosnia		Cyprus
Cameroon	Niger	Oman	Belize	US Virgin Is.	China	Marsahl Isl.	Germany	Bulgaria		Israel
Cape Verde	Nigeria	Qatar	B.V. Islands	Argentina	Hong Kong	Micronesia F.	Greece	Croatia		Turkey
C. African Rep.	Rwanda	Saudi Arabia	Cayman Isl.	Bolivia	India	Nauru	Iceland	Czech Rep.		Bermuda
Chad	Sao T.P.	Syria	Costa Rica	Brazil	Indonesia	N.Caledonia	Ireland	*Czechoslovak.		Greenland
Comoros	Senegal	U. Arab Em.	Cuba	Chile	Iran	N.Mariana.Is	Italy	Estonia		
Congo	Seychelles	Yemen	Dominica	Colombia	Laos	Pacific I.T.T	Luxembourg	Georgia		
Congo Dem.	S. Leone	Algeria	Domin Rep.	Ecuador	Macao	Palau	Monaco	Hungary		
Coted I'voire	Somalia	Djibouti	El Salvador	Falkland Isl.	Malaysia	P.N. Guinea	Netherlands	Kazakhstan		
Eq. Guinea	S. Africa	Egypt	Grenada	F.Guiana	Maldives	Samoa	Norway	Kyrgyzstan		
Eritrea	St. Helena	Libya	Guadeloupe	Guyana	Mongolia	Solomon Isl.	Portugal	Latvia		
Ethiopia	Swaziland	Morocco	Guatemala	Paraguay	Myanmar	Tonga	Spain	Liechtenstein		
Gabon	Tanzania	Sudan	Haiti	Peru	N.Korea	Tuvalu	Sweden	Lithuania		
Gambia	Togo	Tunisia	Honduras	Suriname	Nepal	Vanuatu	Switzerland	Macedonia		
Ghana	Uganda		Jamaica	Uruguay	Pakistan		U.K	Moldova		
Guinea	W. Sahara		Martinique	Venezuela	Philippines		Japan	Poland		
G. Bissau	Zambia		Mexico		S.Korea		Australia	Romania		
Kenya	Zimbabwe		Montserrat		Singapore		New Zealand	Russia		
Lesotho			N.Antilles		Sri Lanka		Canada	Slovak Rep.		
Liberia			Nicaragua		Taiwan		U.S.	Slovenia		
Madagascar			Panama		Thailand			*Soviet Union		
Malawi			Puerto Rico		Viet Nam			Tajikistan		

Source: United Nation Development Programme 1991, 1992, 1993 and 2002, and U.N. Population Division 2002.

\*Refers to unknown republics.



VITA

2

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