DETERMINANTS OF UNAUTHORIZED MIGRATION TO THE UNITED STATES
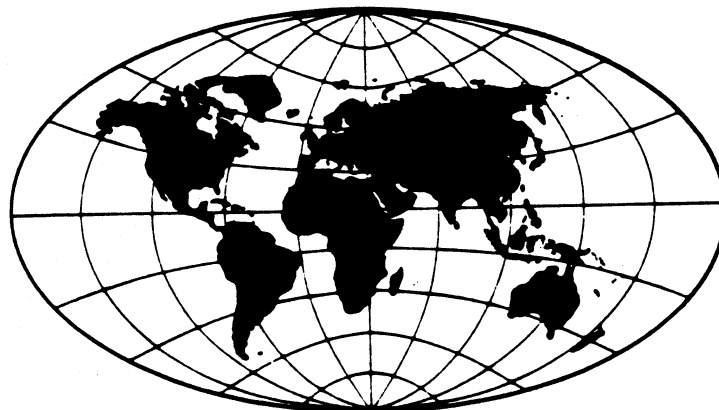
by
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SUMMARY

Unauthorized immigration to the United States is associated with selected characteristics of the home countries of the immigrants. This study helps to specify native-country characteristics and conditions that are associated with unauthorized migration to the United States, and it investigates how these vary by region, particularly for Europe, Latin America, and Asia. Linkages between country characteristics and rates of unauthorized migration to the United States are analyzed for 69 sample countries.

Unauthorized immigrants arrive in the United States by one of two possible means; they either cross a border surreptitiously, or they enter on a temporary, nonimmigrant visa and stay beyond the allotted time period. Given the clandestine status of unauthorized migrants, they are extremely difficult to count. However, the U.S. nonimmigrant visa overstay rate is used as an approximation of the probability of illegal immigration. Estimates of nonimmigrant overstays for 1985 and 1986 were derived at the U.S. Immigration and Naturalization Service (INS) by first estimating "system" error within the Nonimmigrant Information System for each country of origin. Other sources of data on unauthorized migrants were incorporated into the study as well, including applications for legalization under the Immigration Reform and Control Act of 1986, interior apprehensions of aliens, and nonimmigrant visa refusals.

Predictors of the Overstay Rate

The following conditions are important predictors of the nonimmigrant overstay rate, that is, the propensity of a country's nonimmigrants in the United States to overstay the terms of their visas:

-- location in the Latin American/Caribbean region;

-- closer proximity to the United States as measured by miles between principal international airports;

-- a lower gross national product (GNP) per capita;

-- a larger backlog of registrants for legal U.S. immigrant visas;

-- the limitation of civil liberties in the home country, 1973-77;

-- a higher unemployment rate;

-- a lack of improvement, or a deterioration, in the growth rate of the GNP per capita, from 1975-80 to 1980-85; and

-- a higher labor force participation rate among a country's nationals residing in the United States.

Almost all of the above significant relationships are in the expected direction in terms of the less favorable condition being associated with a greater propensity for unauthorized migration to the United States. The one unexpected outcome is the association between location of a country in Latin America and a low propensity for overstaying, controlling for other significant variables. Given the proximity of the Latin America/Caribbean region to the United States, one might expect a relatively greater propensity for unauthorized immigration from this region, holding other characteristics constant. The opposite result obtained leads us to believe that nonimmigrant overstaying is not a good approximation of unauthorized immigration from neighboring countries. The availability of alternative means of entry for unauthorized Latin American immigrants, such as surreptitious border crossings, may have a depressive effect on nonimmigrant overstay rates for this region, especially given that nonimmigrant visas for this region consequently may be disproportionately allocated to wealthier classes, which in general have a greater incentive to return home.

Thus, the nonimmigrant overstay rate has a bias. It is a better proxy measure of the propensity for unauthorized immigration from the Europe/Developed and Asia/Africa regions, than for the propensity for unauthorized immigration from the Latin America/Caribbean region.

Regional Differences

The following are important predictors of nonimmigrant overstaying for each region separately:

European/Developed countries:

-- a larger backlog of registrants for U.S. legal immigrant visas; and

-- fewer U.S. military personnel stationed in the country.

Asia/African countries:

-- a lower GNP per capita;

-- slower growth in private consumption;

-- faster growth of the labor force;

-- a higher educational level among the work force;

-- closer proximity to the United States;

-- slower growth in the manufacturing employment index;

-- a lower inflation rate;

-- a larger proportion of a country's population residing in the United States;

-- a higher unemployment rate; and

-- a political environment fostering greater respect for civil liberties.

Latin America/Caribbean countries:

-- faster urban population growth;

-- a larger backlog of registrants for U.S. legal immigrant visas;

-- a higher labor force participation rate among a country's nationals residing in the United States; and

-- a lower inflation rate.

Thus, the association between less-favorable economic, social, and political conditions in the native country, and the propensity for nonimmigrant overstaying in the United States is most evident for developing regions. For European/Developed countries, noneconomic factors are of primary importance in predicting overstaying in the United States.

Varying results by region are of interest. In the case of the inflation rate, the more-negative condition does not behave in a push manner as predicted; for the developing regions, low inflation is associated with greater overstaying, net of the effects of other significant variables. However, it could be argued that low inflation is indicative of limited economic growth and a shortage of economic opportunities in the home country, and that, therefore, the relationship obtained is not unexpected. Moreover, periods of lower inflation could be associated with the capability of amassing the resources necessary for migration.

The civil rights index behave unexpectedly in the analysis. For Latin American/Caribbean countries, the limitation of civil liberties (CIVRIGHT) is associated with nonimmigrant overstaying, while for Asian/African countries, a freer political climate is associated with overstaying, net of the effects of other significant variables. Perhaps the ability to travel to the United States is associated with a liberal political climate in the Asia/Africa region.

The distance variable also behaves unexpectedly. Contrary to expectations, the United States is a significant predictor of overstaying for Asian/African countries, but not for Latin American/Caribbean countries.

Similar analysis using dependent variables derived from data on legalizations, interior apprehensions, and nonimmigrant visa refusals provide further insight:

-- a general link is confirmed between poorer economic conditions in the home country (e.g., the lack of an increase in the per capita food production index, greater economic

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reliance on the agriculture sector, faster urban population growth, etc.) and higher rates of illegal residence among the nationality group in the United States or higher rates of unauthorized migration to the United States; and

-- as might be expected, U.S. legalization rates for Latin America/Caribbean migrants, and for Asian/African migrants, are high relative to those of migrants from the European/Developed world, net of other significant country conditions.

Conclusion

In general, our results are consistent with migration theory linking high emigration rates with low and intermediate development status. Countries with a relatively low average GNP per capita produce relatively greater unauthorized migration to the United States and have higher rates of illegal residence among their aliens in the United States. Yet, controlling for other determinants, educational attainment is positively related to emigration, a finding consistent with the theory that some minimal standard of living and preparation is a prerequisite for migration.

The findings from this analysis are useful in developing policies concerning unauthorized immigration to the United States. The clear link between poor economic conditions and unauthorized immigration to the United States suggests that policy initiatives that effectively raise the standard of living in the origin countries also should have the effect of reducing unauthorized migration to the United States.

PREFACE

The Center for International Research (CIR) conducts demographic and economic studies, some of which are issued as CIR Staff Papers. A complete list of these papers is included at the end of this report. The use of data not generated by the U.S. Bureau of the Census precludes performing the same statistical reviews the Bureau does on its own data.

This report was prepared in the Population Studies Branch, under the supervision of Arjun Adlakha, former Chief, and Peter O. Way, Chief, Health Studies Branch. Eduardo E. Arriaga, Special Assistant for International Demographic Methods, contributed valuable guidance throughout the project. Barbara Boyle Torrey, Chief of CIR, and Sylvia D. Quick, Assistant Chief for Population and Health Studies, provided assistance and valuable suggestions during the preparation of the report.

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CONTENTS

CONTENTS--Continued

TEXT TABLES

INTRODUCTION

A large number of unauthorized immigrants reside in the United States. In 1986, Congress passed the Immigration Reform and Control Act (IRCA) aimed at regularizing the status of part of the unauthorized population and at stemming future such immigration. The effects of the legislation and its implementation are being widely investigated.

An important approach for understanding and potentially influencing unauthorized immigration is to isolate and review conditions in the native countries which are associated with such migration. A wide variety of factors affect an alien's decision to become an unauthorized immigrant in the United States. In the present study, multivariate regression is used in an exploratory analysis of social, economic, and geographic characteristics of origin countries which might be expected to influence migration to the United States.

Unauthorized immigrants arrive in the United States by one of two possible means: either they cross a border surreptitiously, or they enter on a temporary, nonimmigrant visa and stay beyond the allotted time period. Given their clandestine status, they are extremely difficult to count, and there is no complete, reliable set of data on the number of migrants in the United States, by country of origin.

Recently, however, relevant data have been collected or derived at the U.S. Immigration and Naturalization Service (INS). Nonimmigrant overstay rates were derived in the Statistical Analysis Branch, INS, based on data from the Nonimmigrant Information System. (Nonimmigrants are non-U.S. citizens who are admitted to the United States for specified temporary periods but not for permanent residence.) Applications for legalization under IRCA and interior apprehensions provide additional estimates of unauthorized migrants. Based on these INS sources and on nonimmigrant refusal rates provided by the U.S. Department of State, six rates of unauthorized immigration were obtained and used as dependent variables in this analysis. They are regressed on country characteristics and other variables relevant to the emigration process. The analysis is conducted for 69 countries which are important source countries for nonimmigrants and nonimmigrant overstayers in the United States.

The independent variables were selected from a wide variety of available country data. The selected variables were judged to have a relatively direct theoretical link with migration, often in the form of being possible "push" factors for emigration. Economic and development indicators analyzed include the unemployment rate, growth rate of the labor force, urban population growth rate, inflation rate, gross domestic product per capita, real rate of growth in the per capita gross national product, educational level of the labor force, etc. Other types of predictors tested include a civil rights index, geographic proximity to the United States, the size of the backlog of registrants for U.S. immigrant visas, the proportion of a country's population residing in the United States, the number of U.S. military personnel stationed in the country, etc.

In general, the goal of the study is to determine what native-country characteristics and conditions may be associated with unauthorized migration to the United States and to investigate how these vary by region, particularly for Europe, Latin America, and Asia. Since the available measures of unauthorized immigration to the United States have conceptual differences, as well as problems of reliability and completeness, our results, and especially our conclusions, are tentative.

METHOD

<u>Derivation of Dependent Variables</u>

Clearly, there is no ideal measure of total unauthorized migrants in the United States, by country of origin. Each data source has its unique problems of incompleteness. This study experiments with a variety of data sources; however, the bulk of the analysis centers on the nonimmigrant overstay rate. Therefore, we include here a brief description of the method used to estimate the overstay rates for each country.

The rates of nonimmigrant overstay are based on data collected in the INS's Nonimmigrant Information System.[1] The estimation procedure utilizes statistics on "apparent overstays," a term used by the INS to refer to the number of arrival forms for which matching departure records are not available. The majority of the apparent overstays are the result of system error (incomplete collection of departure forms, failure to record extensions of stay, etc); the remainder is the number who overstay nonimmigrant visas.

In order to estimate system error (and therefore overstays), we first identified a group of countries that, according to specified criteria, have very few unauthorized migrants in the United States.[2] For these countries <u>all</u> of the apparent overstays are assumed to be the result

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[1]The Nonimmigrant Information System (NIIS) of the U.S. Immigration and Naturalization Service is designed to provide a record of all nonimmigrant arrivals and departures. The vast majority of nonimmigrants are tourists, and most of the rest are visitors for business purposes. Other, smaller categories include students, foreign government officials, temporary workers, and other minor groups. In 1986, a total of 10.5 million nonimmigrants were admitted to the United States. For a more complete description of the INS Nonimmigrant Information System [and a (superseded) methodology for estimating nonimmigrant overstays], see, Robert Warren, "The INS Nonimmigrant Information System: Assessing the Statistics on Nondeparture." <u>Proceedings of the Second Annual Research Conference</u>, Bureau of the Census, March 23-26, 1986, Reston, Virginia, pp. 650-664.

[2]The criteria used to select the countries included:

1) few apprehensions of deportable aliens in 1986 and 1987;
2) few applications for legalization under IRCA;
3) small backlogs for legal immigrant visas;
4) low estimates of undocumented aliens counted in the 1980 U.S. census; and
5) low rates of "apparent overstay."

The following countries had a sizeable number of arrivals and were very low on each criteria:

Belgium	Norway	Switzerland	Saudi Arabia	Australia	Netherlands Antilles
Finland	Sweden	Singapore	Kuwait	New Zealand	Suriname

of system error. The rates of apparent overstay for the selected countries were used to estimate system error. Visa overstays were then estimated as the difference between apparent overstays and system error. Estimates of overstays were derived separately for air, land, and sea arrivals, by class of admission (tourists, visitors for pleasure, others), for each country of origin.[3] The rates used in this study are the average of the estimated overstay rates for fiscal years 1985 and 1986.

The variety of measures of unauthorized migration to the United States which are used as dependent variables in this study are derived from the following four kinds of data:

1) nonimmigrant arrivals and departures from the INS Nonimmigrant Information System as described above (dependent variables, LNOVRATE and LNOVRATP);

2) applications for legal residence under IRCA (LNLERATE and LNLERATP);

3) deportable aliens apprehended after 72 hours in the United States (LNAPRATE); and

4) U.S. nonimmigrant visa applications and refusals at foreign posts (REFURATE).

Six rates of unauthorized migration were constructed from the above data (table 1). The denominators used in the rates vary and impart different interpretations to the results. For both the principal nonimmigrant overstay rate (LNOVRATE) and the nonimmigrant visa refusal rate (REFURATE), the choice of a denominator was obvious. In the former case, it refers to the population at risk of overstaying (expected nonimmigrant departures), and in the latter case, the population at risk of being refused a nonimmigrant visa (applicants for such a visa). For the principal legalization rate (LNLERATE) and the apprehension rate (LNAPRATE), respectively, the foreign-born population counted in the 1980 U.S. census was used as the denominator; thus creating measures which suggest the propensity for a country's aliens in the United States to be without authorization, or rates of "illegal" residence in the United States.[4]

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[3] Estimates of system error were derived separately for each of the following categories of admission:

Nonimmigrant Categories

Mode of travel	Tourist	Business	Transit Aliens	Temporary workers	All others
Air	X	X	X	X	X
Sea	X	X			X
Land	X	X			X

[4] It is assumed that the 1980 census counted legal and unauthorized aliens to an equal degree for each country of origin.

The term "illegal," as used in this paper, refers to the status of non-U.S. citizens who have not been approved for residence in the United States.

Table 1. Definition of Dependent Variables

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Rates of Illegal Residence in the United States*

LNOVRATE   Non immigrant overstay rate, 1985-1986 (natural log)

Derivation: Nonimmigrant overstays as estimated by INS, fiscal years (FY's) 1985-86, divided by nonimmigrant expected departures, FY's 1985-86 (U.S. INS, 1988b)

LNLERATE   Legalization rate, 1987-88 (natural log)

Derivation: Legalization applications received by INS as of 10/6/88, divided by the U.S. foreign-born population of given nationality, 1980 (U.S. INS, 1988a; and USBC, 1984)

LNAPRATE   Interior apprehension rate, 1987-88 (natural log)

Derivation: Apprehension by INS of deportable aliens who have resided in the United States for more than 72 hours, FY's 1987-88, divided by the U.S. foreign-born population of given nationality, 1980 (U.S. INS, 1988c; and USBC, 1984)

Rates of Unauthorized Migration to the United States**

LNOVRATP   Nonimmigrant overstay rate, 1985-86 (natural log)

Derivation: Nonimmigrant overstays as estimated by INS, FY's 1985-86, divided by the native country population, 1985 (U.S. INS, 1988b; and USBC, 1988b)

LNLERATP   Legalization rate, 1987-88 (natural log)

Derivation: Legalization applications received by INS as of 10/6/88, divided by the native country population, 1985 (U.S. INS, 1988a; and USBC, 1988b)

REFURATE   Nonimmigrant visa refusal rate, FY 1987

Derivation: Nonimmigrant visa refusals divided by nonimmigrant visa applicants, FY 1987 (USDS, 1986)

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*   Denominators refer to nationality groups in the United States.
**   Denominators refer to native country populations.

Finally, the secondary overstay and legalization rates (LNOVRATP) and (LNLERATE), respectively, use the home country population as the denominator and provide measures of the propensity of a country's population to become unauthorized migrants in the United States.

The rate of refusal for nonimmigrant visas (REFURATE) harbors a different idea than the other rates, since persons refused visas never migrated to the United States. However, REFURATE may be thought of as an indicator of potential unauthorized migration to the United States, since visa refusals are based on the judgment by a U.S. consular officer that an applicant is likely to overstay.

Sample Selection

A preliminary sample of 79 countries was selected, based on the importance of the country as a source of nonimmigrant overstayers, and secondarily, nonimmigrant arrivals. First, all countries which had 700 or more estimated nonimmigrant overstays in either 1985 or 1986 were selected for the sample group. Then, of the countries remaining unselected, those with 15,000 or more nonimmigrant arrivals in either year were added to the sample. The variability in the dependent variable for the sample selected in this manner was acceptable, with overstay rates ranging from 0 to 41 percent (Appendix table A1).

Of the 79 countries selected according to the above procedures, 69 ultimately were retained for the analysis (table 2). Ten were dropped because they had a relatively large number of missing values on the independent variables; seven or more missing values on the eighteen independent variables was chosen as a reasonable criterion.

Selection of Independent Variables

A variety of international social and economic data were compiled from sources of the World Bank, the United Nations, the International Labour Office, the Bureau of the Census, etc. Some 50 indicators were considered as potential independent variables. Finally, 18 were selected for analysis, mainly because they were judged to have a fairly direct theoretical association with emigration (table 3).

The final selection of independent variables also represents an effort to control the problem of multicollinearity among independent variables. Many potential indicators were disregarded because of high correlations with variables which had priority from a theoretical standpoint. An effort was made to select independent variables that each represented a unique idea. Nonetheless, some of the independent variables are significantly correlated with one another, and this should be taken into account when interpreting the results. In instances of highly correlated independent variables, an outcome of significance for one variable can preclude such an outcome for related variables on statistical, not theoretical, grounds. Thus, our results must be interpreted with caution (see Appendix table A3).

Table 2. Sample Countries, by Region

EUROPE/ DEVELOPED	LATIN AMERICA/ CARIBBEAN	ASIA/ AFRICA
Austria	Argentina	Bangladesh
Belgium	Belize	China
Denmark	Bolivia	Hong Kong
Finland	Brazil	India
France	Chile	Indonesia
Germany, F.R.	Colombia	Iran
Greece	Costa Rica	Jordan
Hungary	Ecuador	Korea
Ireland	El Salvador	Malaysia
Italy	Guatemala	Pakistan
Netherlands	Guyana	Philippines
Norway	Honduras	Saudi Arabia
Poland	Panama	Singapore
Portugal	Peru	Taiwan
Romania	Venezuela	Thailand
Spain		Turkey
Sweden		
Switzerland	Barbados	
United Kingdom	Dominican Republic	Egypt
Yugoslavia	Haiti	Ethiopia
	Jamaica	Liberia
	Trinidad and Tobago	Nigeria
Australia		Sierra Leone
Canada		
Israel		
Japan		
New Zealand		
South Africa		

Table 3. Definition of Independent Variables

Economic Conditions

AGGDP   Percent of gross national product contributed by agriculture, 1985 (WB, 1987a, table 3)

EMPMANUF Manufacturing activity employment index, 1985 (1980=100) (WB, 1987b)

FOODPRO Per capita food production index, 1985-86 (1979-81 =100) (WB, 1988b, table 7)

GNP8085 Average annual per capita growth rate of the gross national product, 1980-85 (WB, 1988a)

GNP8575 Average annual per capita growth rate of the gross national product, 1980-85, minus that for 1975-80 (WB, 1988a)

LNGNPCAP Natural log of the average gross national product per capita, 1985 (WB, 1987a, table 1)

LNINFLAT Natural log of the average annual rate of inflation, 1980-85 (WB, 1987a, table 1)

PRICONS Average annual growth rate of private consumption, 1980-86 (WB, 1988b, table 4)

UNEMPLOY Percent of labor force unemployed, 1986 (ILO, 1987, table 9; and secondarily, U.S. CIA, 1988)

Social Characteristics

LFAVED   Mean years of school completed by labor force, 1970's or 1980's (Psacharopoulos and Arriagada, 1986, pp. 564-567)

LFGROWTH Average annual growth rate of labor force, 1980-85 (WB, 1988b, table 31)

URBGROW Average annual growth rate of the urban population, 1980-1985 (WB, 1988b, table 32)

Political Conditions

CIVRIGHT Average civil rights index, 1973-79; 1=greatest civil liberty, 7 = least civil liberty (Taylor and Jodice, 1983, table 2.2)

Table 3. Definition of Independent Variables--continued

Immigration to the United States

FBNATIVE   U.S. foreign-born population, 1980, as a percent of native country population, 1980 (USBC, 1984, table 1; and 1978, table 3)

FBPROPLF   Percent of U.S. foreign-born population, ages 20-29 years, in the labor force, 1980 (USBC, 1984, table 4)

LNVISAWA   Natural log of the number of active registrants for U.S. immigrant visas as of 1/1986 (USDS, 1986)

U.S. Foreign Policy

LNUSMIL   Natural log of the number of active U.S. military personnel stationed in the country as of 6/30/87 (USDD, 1987, table P309A)

Geography

DUMAA   Country is coded 1 if it is developing country in Asia, the Middle East, or Africa (22 countries)

DUMLA   Country is coded 1 if it is in Latin America or the Caribbean (21 countries)

MILES   Minimum ticketed airlines mileage between a country's capital, or other major city, and the closest of the following three U.S. international airports: New York, Newark, Los Angeles, or Miami (OAG, 1986)

Prior analysis has found a relationship between the level of social well-being in native countries and unauthorized migration to the United States (CSIMCED, 1988). A number of independent variables are development indicators; for example, GNP per capita (LNGNPCAP) and the average educational level of the labor force (LFAVED). It is predicted that countries in the low to middle range on development indicators might have the highest emigration rates to the United States. On one hand, GNP per capita might be expected to have an inverse relationship with emigration to the United States, since a differential in the standard of living can act as "push" and "pull" factors. On the other hand, a certain level of resources and education is required of migrants in order to accomplish the act of migration. Thus, the educational level of the labor force could be positively related to emigration. In sum, the

relationship between development status and emigration is not expected to be strictly linear. In fact, there is evidence that international migrant labor flows tend to originate in countries at intermediate levels of development (Portes, 1988, p. 3).

The modernization process itself is a stimulus for emigration (Massey, 1988). Emigration tends to accelerate during the transition from a heavily agricultural economy to greater dependence on urban economic activities. Thus, unauthorized migration to the United States is expected to be positively associated with a high rate of urban population growth (URBGROW), and with a relatively high level of economic dependence on agriculture (AGGDP).

Other independent variables reflect economic and political conditions. It is hypothesized that relatively poor economic conditions, recent deterioration in living standards, and a repressive political environment will be associated with greater emigration. For example, an inverse relationship might be expected between the food production per capita index (FOODPRO) and unauthorized emigration to the United States. In other words, the lack of improvement in economic conditions may be conducive to emigration. Also, a decline in the GNP per capita growth rate from 1975-80 to 1980-85 (GNP8575) may indicate unmet aspirations and, consequently, greater emigration. And a restrictive political environment would be more of a force for emigration than one that protects individual rights (CIVRIGHT).

Other independent variables relate to past immigration trends and geographic proximity to the United States. For example, it is hypothesized that rates of unauthorized immigration may be related to the proportion of a country's nationals that is already residing in the United States (FBNATIVE). According to theories of "chain" migration, a strong precedent of migration to the United States should induce greater subsequent migration flows. Moreover, the successful integration by a country's nationals into the United States labor market (FBPROPLF) should correlate with a propensity to continue to "send" migrants. It also was hypothesized that countries' proximity to the United States (MILES) should correlate positively with unauthorized migration to the United States, especially for the Latin America/Caribbean region, since there is greater relative variation in the distance and, therefore, accessibility of the United States labor market for the countries of this region.

It was hypothesized that the effect of country factors impinging on emigration to the United States could vary by region. For instance, overstay rates might tend to be higher for one region than another despite similarities in country conditions across regions. Or the character of the relationships between dependent and independent variables may vary by region. In particular, it was expected that the Latin America/Caribbean region would register higher levels of migration, controlling for other significant factors, because of its geographic proximity. Thus, dummy variables for region were included in the analysis, and separate regressions by region were run.

The countries in the analysis were initially classified into the following three regions: Europe, Asia/Africa/Oceania, and the Americas. Then, for the sake of consistency regarding development status within the country groupings, developed countries outside Europe were put in the European group. These included, based on a subjective judgment, Australia, Canada, Israel, Japan, New Zealand, and South Africa. In the regressions, the European/Developed countries provide the comparison group, while the other two regions, Latin America/Caribbean and Asia/Africa, are coded as dummy variables (see table 2).

Modifications to the Data

A review of the data and of the means and standard deviations for dependent and independent variables revealed some rather skewed distributions. To comply with the assumptions underlying linear regression analysis, natural log transformations were made on five dependent variables and four independent variables. The transformations are noted in the names of the variables such that transformed variable names begin with the letters LN.

The number of missing values for independent variables was reduced upon eliminating countries with an excessive number of missing values (see previous section on Sample Selection, page 5). For the remaining missing values, the mean for the given independent variable was substituted.

Procedure

A number of regressions were performed for this study. The nonimmigrant overstay rate (LNOVRATE) is analyzed in the greatest depth. Initially, LNOVRATE was regressed on the 18 substantive independent variables and the two dummy variables for region. The backward regression procedure was used, with a .10 significance criterion for removal. As further exploration of unauthorized migration, by region of origin, similar regressions with LNOVRATE were done for each of the three regions separately. Finally, the five additional dependent variables were regressed separately on the 18 independent variables and two dummy variables for region, again, using the backward procedure with a .10 significance criterion. An analysis of residuals for each regression suggested that, in general, the error terms were randomly distributed and that the linear model is a fitting model for the data as transformed.

RESULTS

Determinants of the Nonimmigrant Overstay Rate (LNOVRATE)

LNOVRATE was regressed on the 18 substantive independent variables and two dummy variables for region [Latin America/Caribbean (DUMLA) and Asia/Africa (DUMAA)]. Using the backward regression procedure, the insignificant variables were removed, one by one, until only variables that had a significance at or below the .10 level remained in the equation. According to this method, the following are important predictors of overstaying in the United States:

-- size of a country's backlog of registrants for legal immigrant visas to the United States (LNVISAWA);

-- proximity to the United States as measured by miles between principal international airports (MILES);

-- a civil rights index for 1973-77 (CIVRIGHT);

-- the labor force participation rate of a country's residents in the United States (FBPROPLF);

-- the change in the GNP per capita growth rate from 1975-80 to 1980-85 (GNP8575);

-- the average gross national product per capita (LNGNPCAP);

-- the unemployment rate (UNEMPLOY); and

-- location in the Latin America/Caribbean region (DUMLA).

The equation with these variables explains 74 percent of the variance in overstay rates (table 4).

The effect of most of the significant independent variables on overstaying is in an expected direction in light of our hypotheses and known push factors for migration. For example, a tendency for developing countries to have higher overstay rates among their nonimmigrants in the United States is suggested from our sample. Controlling for other variables in the equation, a lower gross national product (LNGNPCAP) per capita is associated with a higher overstay rate. This is not inconsistent with the predicted curvilinear relationship between overstaying and development status, especially given that countries of very low development status are underrepresented in our sample, and that both LNGNPCAP and the overstay rate were logged, which would linearize the relationship.

The economic indicators appear to act as migration "push" factors. Higher unemployment (UNEMPLOY) is associated with overstaying, as is the lack of improvement or a decline in the GNP per capita growth rate from 1975-80 to 1980-85 (GNP8575).

The size of a country's backlog of registrants for legal immigrant visas to the United States (LNVISAWA) also has the expected relationship with overstaying. A larger backlog is associated with a higher nonimmigrant overstay rate. Separate regressions, by region (as shown in tables 5, 6, and 7), clarify that the influence of this variable is significant for European/Developed countries, also important for Latin America/Caribbean, but insignificant for Asia/Africa.

As hypothesized, the limitation of civil liberties (CIVRIGHT) is associated with overstaying in the United States. Again, the separate regressions by region further clarify the nature of this relationship. While the Latin America/Caribbean overstay rate is linked with the limitation of civil liberties in the home countries, the relationship is in the opposite direction for Asian/African countries. In the latter region, a freer political climate is associated with overstaying in the United States. Surprisingly, for the European/Developed region, CIVRIGHT is not a significant determinant of overstaying (tables 5, 6 and 7).

Table 4. Significant Determinants of the U.S. Nonimmigrant Overstay Rate (LNOVRATE)

Significance level	Independent variable	Regression coefficient	Standardized beta coefficient
< .01	DUMLA	-3.009	-.526
	LNVISAWA	.409	.266
	MILES	-.0004	-.394
.01 to .05	CIVRIGHT	.364	.239
	FBPROPLF	.044	.196
	GNP8575	-.135	-.198
	LNGNPCAP	-.757	-.349
	UNEMPLOY	.099	.209
.05 to .10	LNUSMIL	-.125	-.153
	URBGROW	.434	.255

Note: LNOVRATE was regressed on 20 independent variables using the backward regression procedure with a .10 significance criterion for removal. R squared = .73. Constant = -.803.

A brief description of the variables follows:

LNOVRATE: Nonimmigrant overstay rate (denominator = expected departures)
DUMLA: Latin American or Caribbean country
LNVISAWA: Backlog of registrants for U.S. legal immigrant visas
MILES: Distance to the United States
CIVRIGHT: Civil rights index, 1 = greatest civil liberty, 7 = least civil liberty
FBPROPLF: Labor force participation rate for nationality group in the United States
GNP8575: Change in the GNP per capita growth rate, 1975-80 to 1980-85
LNGNPCAP: GNP per capita
UNEMPLOY: Unemployment rate
LNUSMIL: Number of U.S. military personnel stationed in the country
URBGROW: Urban population growth rate

Table 5. Significant Determinants of the U.S. Nonimmigrant Overstay Rate (LNOVRATE), for European/Developed Countries

Significance level	Independent variable	Regression coefficient	Standardized beta coefficient
< .01	LNUSMIL	-.601	-.531
	LNVISAWA	1.669	.656
.01 to .05			
.05 to .10	LFGROWTH	-1.181	-.211
	LNGNPCAP	-1.218	-.245
	UNEMPLOY	.151	.203

Note: LNOVRATE was regressed on 18 independent variables using the backward regression procedure with a .10 significance criterion for removal. R squared = .80. Constant = .383.

A brief description of the variables follows:

LNOVRATE:	Nonimmigrant overstay rate (denominator = expected departures)
LNUSMIL:	Number of U.S. military personnel stationed in the country
LNVISAWA:	Backlog of registrants for U.S. legal immigrant visas
LFGROWTH:	Labor force growth rate
LNGNPCAP:	GNP per capita
UNEMPLOY:	Unemployment rate

14

Table 6. Significant Determinants of the U.S. Nonimmigrant Overstay Rate (LNOVRATE), for Asia/Africa Countries

Significance level	Independent variable	Regression coefficient	Standardized beta coefficient
< .01	CIVRIGHT	-.344	-.201
	EMPMANUF	-.028	-.281
	FBNATIVE	1.016	.267
	LFAVED	.308	.442
	LFGROWTH	1.017	.479
	LNGNPCAP	-1.673	-1.250
	LNINFLAT	-.553	-.274
	MILES	-.0003	-.334
	PRICONS	-.252	-.482
	UNEMPLOY	.057	.242
.01 to .05	URBGROW	.251	.234
.05 to .10	LNUSMIL	.038	.100

Note: LNOVRATE was regressed on 18 independent variables using the backward regression procedure with a .10 significance criterion for removal. R squared = .99. Constant = 15.869.

A brief description of the variables follows:

LNOVRATE:	Nonimmigrant overstay rate (denominator = expected departures)
CIVRIGHT:	Civil rights index, 1 = greatest civil liberty, 7 = least civil liberty
EMPMANUF:	Manufacturing activity employment index
FBNATIVE:	Proportion of a country's population residing in the United States
LFAVED:	Average educational level of labor force
LFGROWTH:	Labor force growth rate
LNGNPCAP:	GNP per capita
LNINFLAT:	Inflation rate
MILES:	Distance to the United States
PRICONS:	Growth rate of private consumption
UNEMPLOY:	Unemployment rate
URBGROW:	Urban population growth rate

Table 7. Significant Determinants of the U.S. Nonimmigrant Overstay Rate (LNOVRATE), for Latin America/Caribbean Countries

Significance level	Independent variable	Regression coefficient	Standardized beta coefficient
< .01	FBPROPLF	.055	.324
	LNINFLAT	-.347	-.322
	URBGROW	.435	.356
.01 to .05	CIVRIGHT	.330	.279
	UNEMPLOY	.092	.303
.05 to .10			

Note: LNOVRATE was regressed on 18 independent variables using the backward regression procedure with a .10 significance criterion for removal. R squared = .88. Constant = -10.906.

A brief description of the variables follows:

LNOVRATE: Nonimmigrant overstay rate (denominator = expected departures)
FBPROPLF: Labor Force participation rate for nationality group in the United States
LNINFLAT: Inflation rate
LNVISAWA: Backlog of registrants for U.S. legal immigrant visas
URBGROW: Urban population growth rate
CIVRIGHT: Civil rights index, 1 = greatest civil liberty, 7 = least civil liberty
UNEMPLOY: Unemployment rate

16

MILES also has the predicted impact on overstaying--closer proximity to the United States is associated with overstaying. However, the effect of MILES mainly pertains to the Asia/Africa region, and not to Latin America/Caribbean countries as expected (tables 5, 6, and 7). A useful interpretation of the significance of this variable, then, is not readily apparent.[5]

The association of FBPROPLF with overstaying is as expected; higher labor force participation by a country's residents in the United States predicts greater overstaying. The separate regressions by region clarify that this impact holds mainly for the Latin America/Caribbean region.

Finally, the dummy variable for Latin America/Caribbean countries (DUMLA) is highly significant; a distinct relationship between the predictors and the overstay rate is in evidence for this region. But surprisingly, the coefficient for DUMLA is strongly negative. That is, Latin American and Caribbean overstay rates are relatively low, given country conditions. In other words, controlling for the other significant variables, the Latin America/Caribbean region has low overstay rates relative to the other regions. This is not the expected outcome, since the geographic proximity of Latin America/Caribbean should produce relatively higher rates of unauthorized migration to the United States, net of the effects of other variables. This finding for the Latin American/Caribbean region might be explained in a couple of ways, however. Many unauthorized migrants from this region cross U.S. borders surreptitiously rather than use nonimmigrant visas. The availability of other alternatives for entry may have a depressive effect on nonimmigrant overstay rates for this region.

Given the significantly different intercept for the Latin America/Caribbean region (DUMLA), by comparison with the European/Developed and Asia/Africa regions, additional analysis was conducted to detect interaction effects between DUMLA and the significant independent variables with respect to the overstay rate. No significant interaction effects were found. Thus, even while levels of overstaying are relatively low for the Latin America/Caribbean region, given country characteristics and conditions, the nature or direction of the significant relationships were not found to differ significantly for Latin America/Caribbean.

Determinants of the Nonimmigrant Overstay Rate, by Region

Separate regressions for each region shed further light on the determinants of nonimmigrant overstaying, by region. As in the overall regressions, most of the significant predictors in the

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[5]Given the large distances from European/Developed countries to the United States (except in the case of Canada), and similarly from Asia/Africa to the United States, the relatively minor differences would not be expected to affect overstay rates per se. The relationships found are likely to be spurious. In the case of Asia/Africa countries especially, for which distance to either New York or Los Angeles, whichever was less, was coded, no interpretive significance can be attached to the finding.

separate regional regressions have the expected direction of association. For European/ Developed countries, noneconomic variables, such as a larger backlog of applicants for legal U.S. immigrant visas (LNVISAWA) and a smaller U.S. military contingent stationed in the country (LNUSMIL), have the strongest link with overstaying in the United States. With regard to the latter variable, the West German case weighs heavily in the results, since it has a very large U.S. military contingent and an overstay rate of 0. For the developing regions (Asia/Africa and Latin America/Caribbean), economic, social, and political variables are preeminent predictors. In fact, for the European/Developed region also, the expected link between less-favorable economic conditions [e.g. low GNP per capita (LNGNPCAP) and high unemployment (UNEMPLOY)] and nonimmigrant overstaying in the United States is apparent (tables 5, 6, and 7).

Regarding Asia/Africa, development status as represented by three significant independent variables--GNP per capita (LNGNPCAP), average educational level of the labor force (LFAVED), and average growth of the labor force (LFGROWTH)--has the expected ambiguous relationship with overstaying in linear regression analysis. Relatively low development status implies a higher overstay rate, except in the case of LFAVED, which suggests educational attainment has a positive effect on overstaying (table 6).

For Latin America/Caribbean, most of the development and economic indicators have the expected effect on overstaying. For this neighboring region, rapid modernization might be expected to have a greater impact on emigration to the United States In the regression, fast urban population growth (URBGROW), sometimes associated with rapid modernization, predicts a high overstay rate (table 7).

For both Latin America/Caribbean and Asia/Africa, the recent inflation rate (LNINFLAT) is a significant predictor of overstaying in the United States. Surprisingly, it is an inverse association. In this case, the more negative economic condition (higher inflation) does not behave in a "push" manner. However, higher inflation may be indicative of a favorable condition of substantial economic growth.

Determinants of Other Measures of Unauthorized Immigration

A comparison of the important determinants of various measures of unauthorized migration is insightful. As discussed above, the average nonimmigrant overstay rate for the Latin America/Caribbean region was low relative to that of the other regions, controlling for the other independent variables in the equation. This is surprising given Latin America's proximity to the United States. However, these results with the overstay rate are more understandable in light of the regressions using legalization or apprehension rates as the dependent variable. An opposite phenomenon occurs. Location in the Latin American/Caribbean region implies both higher rates of unauthorized migration to the United States (dependent = LNLERATP) and higher rates of illegal residence among aliens in the United States (dependents = LNLERATE and LNAPRATE), holding constant other significant factors (table 8). The results with legalization and apprehension data are consistent with our expectation that rates of unauthorized migration from the Latin America/Caribbean region be high relative to those of more distant regions, controlling for other relevant conditions.

Table 8. Significant Determinants of Unauthorized Migration to the United States

Significance level and R-squared	Rates of illegal residence in the United States*			Rates of unauthorized migration to the United States**		
	LNOVRATE	LNLERATE	LNAPRATE	LNOVRATP	LNLERATP	REFURATE
< .01	DUMLA (-.526) LNVISAWA (.266) MILES (-.394)	AGGDP (.401) DUMAA (.331) DUMLA (.616)	AGGDP (.372) DUMLA (.266) LFGROWTH (.412)	NP8575 (-.297) LNVISAWA (.351) MILES (-.420) UNEMPLOY (.274)	FOODPRO (-.244) LNUSMIL (-.216) LNVISAWA (.259) MILES (-.392)	LFAVED (.307) LNGNPCAP (-.567) LNINFLAT (-.223) LNVISAWA (.370) PRICONS (-.289) URBGROW (.445)
.01 to .05	CIVRIGHT (.239) FBPROPLF (.196) GNP8575 (-.198) LNGNPCAP (-.349) UNEMPLOY (.209)	FOODPRO (-.166)	PRICONS (-.186)	FBPROPLF (.238) LNUSMIL (-.218) URBGROW (.233)	DUMAA (.317) DUMLA (.301) FBPROPLF (.199) LFAVED (.188)	LFGROWTH (-.240)
.05 to .10	LNUSMIL (-.153) URBGROW (.255)			DUMLA (-.255)	GNP8085 (-.164) LNINFLAT (-.146)	
R-squared	.73	.73	.65	.60	.76	.68

* Denominators refer to nationality groups in the United States.
** Denominators refer to native country populations.

Note: The dependent variables were regressed on 20 independent variables using the backward regression procedure with a .10 significance criterion for removal.

Figures in parentheses are standardized beta coefficients.

For a description of the variables, see tables 1 and 3.

For dependent variables LNOVRATP and LNLERATP, the independent variable, FBNATIVE, was omitted from the regression since it was computed using the same denominator and was therefore highly correlated.

These contrasting results lend credence to the interpretation that, for the neighboring Latin American/Caribbean region, avenues other than the nonimmigrant system, such as unauthorized border crossings, may be more attractive as a means of entering the United States. The divergent outcomes point to the conceptual differences in the dependent variables and underscore the fact that they measure different segments of illegal movement to the United States, with varying levels of reliability. For example, the legalization data may best cover unauthorized migrants from the Latin American/Caribbean region, while data on nonimmigrant overstays best reflect trends in unauthorized migration from other parts of the world.

The dummy variable for Asia/Africa also is significant in the regressions using the legalization rates (LNLERATE and LNLERATP). According to this data set, a country's location in Asia/Africa (DUMAA), like location in Latin America/Caribbean (DUMLA), has a significant positive effect on the tendency for its migrants residing in the United States to experience illegal status (LNLERATE). This geographic/development status effect is determined in comparison with the European/Developed group and is strongest for Latin America/Caribbean, but also significant for Asia/Africa. With respect to the propensity for countries to have unauthorized migrants in the United States (LNLERATP), DUMAA and DUMLA have an almost identical positive effect (table 8).

Other variables which have an impact on the rates of illegal residence in the United States [as measured by both legalization and apprehension data (LNLERATE and LNAPRATE)] relate to development status and economic conditions in the home country. In general, low development status and poor economic conditions are associated with high rates of illegal residence among aliens in the United States, as hypothesized. A high percent of the gross domestic product contributed by agriculture (AGGDP) and rapid growth rate of the labor force (LFGROWTH) predict a high rate of illegal residence for a country's migrants. Moreover, poor performance of the food production index per capita (FOODPRO), as well as the lack of growth of private consumption (PRICONS), is associated with illegal status among aliens in the United States (table 8).

The propensity of countries' populations to migrate to the United States without authorization, as measured by the data on nonimmigrant overstays (LNOVRATP) and the legalization data (LNLERATP), is significantly affected by economic, geographic, and U.S. immigration variables. The larger a country's backlog of registrants for legal U.S. immigrant visas (LNVISAWA), the higher the rate of unauthorized migration to the United States. Also as expected, the distance variable (MILES) has an inverse relationship with the rate of unauthorized migration. Proximity to the United States is associated with higher rates of unauthorized migration, presumably as a function of eased access to the United States in terms of travel time and investment. At the same time, the number of U.S. military personnel abroad (LNUSMIL) is negatively related to unauthorized migration to the United States (table 8). This is contrary to our hypothesized link, that stronger international ties be conducive to unauthorized migration. Perhaps strong international ties result in greater legal rather than greater unauthorized immigration.

A couple of additional independent variables reflecting current economic conditions should be pointed out. The propensity for countries of all regions to have unauthorized migrants in the United States (LNOVRATP) is positively related to the unemployment rate (UNEMPLOY)

and to the lack of improvement, or a deterioration, in economic conditions from the 1970's to the 1980's (GNP8575) (table 8).

Like the other dependent variables, the rate of refusal of U.S. nonimmigrant visas abroad (REFURATE) also is related to countries' low development status and recent, unfavorable economic conditions. Significant determinants of the refusal rate include low GNP per capita (LNGNPCAP), a rapid rate of urbanization (URBGROW), and a lack of growth of private consumption (PRICONS). However, controlling for such conditions, the refusal rate also is associated with a more educated labor force (LFAVED) and low inflation (LNINFLAT) (table 8). It is notable that there is neither a regional (DUMAA or DUMLA) nor distance (MILES) factor with a significant relationship to the nonimmigrant visa refusal rate. Controlling for effects of the other significant determinants, refusal rates do not vary significantly by region.

CONCLUSION

This study consists of various exploratory multivariate regressions, using six available measures of unauthorized migrants in the United States, for 69 origin countries. The combination of results furthers our understanding of the factors associated with unauthorized migration to the United States, by region.

The results suggest and confirm a strong link between relatively low development status and deteriorating economic conditions on the one hand, and both high rates of illegal residence among nationality groups in the United States (LNOVRATE, LNLERATE, and LNAPRATE) and high rates of unauthorized migration to the United States (LNOVRATP, LNLERATP, REFURATE) on the other hand. The exact nature of the relationships could not be specified in the present type of macro-level analysis. In general, our findings are consistent with migration theory linking high emigration rates to low and intermediate development status. Countries with a relatively low GNP per capita produce relatively greater unauthorized migration to the United States, and migrants from such countries have higher rates of illegal residence in the United States. Yet, controlling for other determinants, educational attainment is positively related to emigration, a finding consistent with the idea that some minimal standard of living and preparation is a prerequisite for the migration.

Geographic region itself is a predictor of unauthorized immigration to the United States, even net of the effect of distance to the United States (MILES). The nonimmigrant overstay rates for Latin American/Caribbean countries are relatively low, given country conditions. At the same time, alien legalization rates for Latin American/Caribbean countries, and for Asian/African countries, are high relative to those of the European/Developed region, controlling for country conditions. These contrasting results reflect the fact that the nonimmigrant overstay rate is a less adequate indicator of unauthorized migration from the neighboring Latin American/Caribbean countries. Unauthorized migrants from this region have a lesser tendency to use the nonimmigrant visa system and a greater tendency to cross the U.S. border surreptitiously. Moreover, nonimmigrants from the Latin America/Caribbean region also may have a greater tendency to be from wealthier social classes, and such nonimmigrant visitors would have less incentive to overstay.

In separate regressions by region, it is shown that noneconomic factors are most influential in predicting unauthorized immigration from European/Developed countries. These include a larger backlog of legal immigrant visas and a lower number of U.S. military personnel stationed in the country. For the two developing regions, economic factors play a paramount role in the predictions. In general, our findings are highly consistent with theory regarding "push" factors for migration and with our expectations that the legal visa backlog would be strongly associated with unauthorized migration.

The findings from this analysis are useful for designing constructive policies for deterring unauthorized immigration to the United States. The clear link between poor economic conditions and unauthorized immigration to the United States suggests that policy initiatives that effectively raise the standard of living in the origin countries also should have a deterrent effect on unauthorized migration to the United States.

FUTURE RESEARCH

Additional research ideas are suggested by the analysis. A few specific examples are outlined here.

One essential task is to further improve the quality of the dependent variables. One idea that should be tried is the combination of the data on nonimmigrant overstayers with those on nonimmigrant visa refusals to derive a dependent variable suggestive of both actual and potential unauthorized migrants. Such a comprehensive measure might be more indicative than either of the components alone of the propensity for countries to produce illegal migration to the United States.

In addition, current work being done on length of overstay for nonimmigrant overstayers by country of origin will lead to a differentiation between longer- and shorter-term overstayers and further improve the quality of this dependent variable as a measure of long-term unauthorized immigration (Kraly and Warren, 1989).

In the same vein, further experimentation could be done with the legalization data. In the present analysis, the number of unauthorized aliens who had resided in the United States since at least 1982 (I-687 applications) was used in the dependent variable. Unauthorized aliens who entered the United States during and since 1982 unfortunately are not included in this data set. Another source of data resulting from IRCA are the applications for the Special Agricultural Workers program (I-700). These data include aliens who entered after 1982. A combination of the I-687 and I-700 data could form a revised dependent variable better reflecting the overall unauthorized population in the United States.

Another issue is whether the distinction between legal and illegal migration is useful in analyzing the determinants of migration. There is little evidence to suggest that the determinants of unauthorized migration are different than those of legal migration. A future approach might be to combine data on legal immigration with the estimates of unauthorized migrants. Such a revision of the dependent variables would imply an analysis of the determinants of total migration to the United States.

An understanding of the regional effect (DUMLA and DUMAA) on unauthorized migration to the United States is essential. In fact, the dummy variables behave differently for different dependent variables. This is evidence that the various data sets on unauthorized migrants have varying levels of coverage, perhaps specific to the regions. Just as separate regressions by region, using the nonimmigrant overstay rate (LNOVRATE), was helpful, so additional separate regional regressions, using the other data sets [particularly the legalization data (LNLERATE and LNLERATP)], would further our understanding of how the determinants of migration differ by region.

APPENDIX A

Estimation of Nonimmigrant Overstays

Nonimmigrant overstays are estimated based on the difference between expected and verified departures. Ideally, recorded arrivals which have no corresponding departure record after a certain period of time should represent the number of overstays. However, this difference is only "apparent overstays" and includes "system error." While the recording of arrivals is considered fairly reliable, the recording of departures has been problematic. Departure forms have not been consistently collected and matched with the corresponding arrival form. The derivation of "estimated overstays" first required the estimation of "system error" with regard to nondeparture, by country of origin.

The number of "apparent overstays" for a selected group of countries formed the basis for estimating system error. The countries selected met certain criteria which indicated they had very few unauthorized migrants in the United States Therefore, it could be assumed that "apparent overstays" for these countries were virtually all a result of system error.

The criteria used to select the countries included:

1) few apprehensions of deportable aliens in 1986 and 1987;
2) few applications for legalization under IRCA;
3) small backlogs for legal immigrant visas;
4) low estimates of undocumented aliens counted in the 1980 U.S. census; and
5) low rates of "apparent overstay."

The following countries had a sizeable number of arrivals and were very low on each criteria:

| Belgium | Norway | Switzerland | Saudi Arabia | Australia | Netherlands Antilles |
| Finland | Sweden | Singapore | Kuwait | New Zealand | Suriname |

Estimates of system error were derived separately for each of the following nonimmigrant categories:

Nonimmigrant Categories

Mode of travel	Tourist	Business	Transit Aliens	Temporary workers	All others
Air	X	X	X	X	X
Sea	X	X			X
Land	X	X			X

Then, for each nonimmigrant category, a mean and standard deviation was computed based on the apparent overstay rates for the selected countries. The point estimate of system error for a given category was assumed to be one standard deviation above the mean. This was assumed to be a better point estimate than the mean, because otherwise the selected countries in almost all cases would continue to register a small number of overstayers.

Finally, overstay rates were estimated for each country by taking the difference between apparent overstays and estimated "system error."

The rates of apparent overstays for all countries were derived approximately 10 months after the end of the fiscal year, giving most nonimmigrants the opportunity to complete the term of their visas. The rates were calculated based on "expected nonimmigrant departures," i.e. "total nonimmigrant arrivals" minus "nonimmigrants in status" minus "nonimmigrants adjusted to legal status" minus "nonimmigrants apprehended."

Table A1. U.S. Nonimmigrant Overstay Rates for 1985-86, by Country of Origin

Region and country	Overstays as percent of expected departures (LNOVRATE)	Overstays per 10,000 native population (LNOVRATP)
Europe/Developed		
1. Australia	.00	.00
2. Austria	.66	1.01
3. Belgium	.02	.03
4. Canada	17.79	6.57
5. Denmark	1.26	3.35
6. Finland	.01	.02
7. France	.36	.54
8. Germany, F.R.	.00	.00
9. Greece	4.12	4.21
10. Hungary	4.00	1.06
11. Ireland	5.95	31.98
12. Israel	4.23	25.46
13. Italy	2.36	2.22
14. Japan	.05	.13
15. Netherlands	.06	.15
16. New Zealand	.02	.10
17. Norway	.00	.00
18. Poland	41.47	11.26
19. Portugal	13.32	9.25
20. Romania	11.11	.53
21. South Africa	2.67	.59
22. Spain	.89	.53
23. Sweden	.15	.47
24. Switzerland	.00	.01
25. United Kingdom	.27	1.08
26. Yugoslavia	8.99	1.98
Latin America/Caribbean		
27. Antigua*	6.47	234.85
28. Argentina	.03	.03
29. Bahamas*	3.30	608.74
30. Barbados	3.11	45.53
31. Belize	8.77	108.89
32. Bolivia	4.60	2.65
33. Brazil	.80	.24
34. Chile	.99	.74

Table A1. U.S. Nonimmigrant Overstay Rates for 1985-86, by Country of Origin--Continued

Region and country	Overstays as percent of expected departures (LNOVRATE)	Overstays per 10,000 native population (LNOVRATP)
Latin America/Caribbean--continued		
35. Colombia	3.43	3.71
36. Costa Rica	.31	1.26
37. Cuba*	16.52	2.57
38. Dominica*	5.09	253.79
39. Dominican Republic	4.40	9.73
40. Ecuador	8.50	9.75
41. El Salvador	5.33	11.03
42. Guatemala	5.87	9.58
43. Guyana	17.03	69.12
44. Haiti	16.11	46.37
45. Honduras	4.89	11.51
46. Jamaica	5.63	64.30
47. Mexico	3.91	8.21
48. Netherlands Antilles*	.55	12.15
49. Nicaragua	13.60	16.96
50. Panama	1.88	8.11
51. Peru	3.78	2.33
52. St. Kitts-Nevis*	9.19	283.08
53. Trinidad and Tobago	2.56	33.61
54. Venezuela	.09	.14
Asia/Africa		
55. Bangladesh	17.54	.14
56. China	4.57	.10
57. Egypt	9.88	1.00
58. Ethiopia	21.7	6.35
59. Hong Kong	.46	1.08
60. India	6.18	.16
61. Indonesia	1.33	.04
62. Iran	17.47	3.12
63. Jordan	4.20	5.14
64. Kampuchea*	8.04	.10
65. Korea	3.51	1.66
66. Lebanon*	10.15	14.07
67. Liberia	30.83	12.24
68. Malaysia	3.46	1.26
69. Nigeria	4.64	.35

Table A1. U.S. Nonimmigrant Overstay Rates for 1985-86, by Country of Origin--Continued

Region and country	Overstays as percent of expected departures (LNOVRATE)	Overstays per 10,000 native population (LNOVRATP)
Asia/Africa--continued		
70. Pakistan	12.82	.82
71. Philippines	14.48	5.53
72. Saudi Arabia	.72	.31
73. Sierra Leone	33.95	3.73
74. Singapore	.04	.09
75. Taiwan	.81	.50
76. Thailand	4.59	.38
77. Tonga*	30.21	131.75
78. Turkey	4.25	.28
79. Vietnam*	11.63	.08

* These countries had a large number of missing values on the independent variables and, therefore, were excluded from the analysis. The criterion for exclusion was seven or more missing values on the 18 substantive independent variables.

Note: Estimates of nonimmigrant overstays were derived by the Statistical Analysis Branch, U.S. Immigration and Naturalization Service.

The natural logs of above values were used in the analysis.

Source: U.S. Immigration and Naturalization Service, Nonimmigrant Information System, 1988; and U.S. Bureau of the Census, International Data Base, 1988.

Table A2. Mean and Standard Deviation for Dependent and Independent Variables

Variable	Number of cases	Mean	Standard deviation
Dependent			
LNAPRATE	69	-1.03	1.47
LNLERATE	69	1.16	1.89
LNLERATP	69	.39	2.31
LNOVRATE	69	.34	2.69
LNOVRATP	69	.08	2.62
REFURATE	66	.18	.17
Independent			
AGGDP	59	14.86	12.14
CIVRIGHT	67	3.42	1.79
EMPMANUF	61	103.11	20.39
FBNATIVE	69	1.46	2.26
FBPROPLF	69	66.65	11.99
FOODPRO	67	101.71	9.43
GNP8085	68	-.16	3.74
GNP8575	67	-2.68	4.01
LFAVED	59	6.42	2.98
LFGROWTH	65	2.06	1.08
LNGNPCAP	67	7.64	1.26
LNINFLAT	65	2.43	1.22
LNUSMIL	69	4.29	3.29
LNVISAWA	69	8.47	1.75
MILES	69	4333.17	2580.80
PRICONS	63	1.38	3.20
UNEMPLOY	50	9.72	6.72
URBGROW	65	2.87	1.63

Note: For a definition of the variables, see tables 1 and 3.

Table A3. Correlation Matrix for Dependent and Independent Variables

Correlations:	LNOVRATE	LNOVRATP	LNLERATE	LNLERATP	LNAPRATE	REFURATE	AGGDP	CIVRIGHT	DUMAA	DUMLA	EMPMANU
LNOVRATE	1.0000	.7934**	.5064***	.3923***	.3993***	.6632***	.5791**	.5530**	.2796*	.1664	.3623*
LNOVRATP	.7934**	1.0000	.4484***	.7274***	.3816***	.5141***	.1598	.1875	-.1281	.4466**	.2362
LNLERATE	.5064***	.4484***	1.0000	.6934***	.9003***	.5969***	.6461**	.3591*	.2379	.5543***	.3398*
LNLERATP	.3923***	.7274***	.6934***	1.0000	.6139***	.4958***	.1143	-.0081	-.2476	.7173***	.1517
LNAPRATE	.3993***	.3816***	.9003***	.6139***	1.0000	.5128***	.5280**	.2653	.1093	.5293***	.2902
REFURATE	.6632***	.5141***	.5969***	.4958***	.5128***	1.0000	.6419***	.4199***	.2303	.2626	.3710*
AGGDP	.5791**	.1598	.6461***	.1143	.5280**	.6419***	1.0000	.4806***	.5676***	-.0146	.5767**
CIVRIGHT	.5530**	.1875	.3591*	-.0081	.2653	.4199***	.4806***	1.0000	.5259***	-.0308	.4030**
DUMAA	.2796*	-.1281	.2379	-.2476	.1093	.2303	.5676***	.5259***	1.0000	-.4525***	.3653*
DUMLA	.1664	.4466***	.5543***	.7173***	.5293***	.2626	-.0146	-.0308	-.4525***	1.0000	.0771
EMPMANUF	.3623*	.2362	.3398*	.1517	.2902	.3710*	.5767**	.4030**	.3653*	.0771	1.0000
FBPROPLF	.0949	.2347	-.0248	.2762	-.0964	.1441	-.0940	-.2263	-.4970**	.1918	-.1819
FBNATIVE	.1792	.5574***	.0702	.5822***	.0067	.1785	-.2933	-.3159*	-.3427*	-.4228***	.1616
FOODPRO	-.2456	-.3984***	-.5280***	-.5936***	-.4823***	-.3525*	-.1922	-.0753	.1893	-.5638***	-.2254
GNP8085	-.2285	-.3978***	-.3412*	-.4457***	-.3853***	-.2634	-.1110	.0263	.2806	-.5579***	-.1386
GNP8575	-.1143	-.2618	-.1320	-.2548	-.1307	-.0575	-.0963	-.0651	.0841	-.3472*	-.1547
LFAVED	-.5323***	-.2648	-.6519***	-.1515	-.5652***	-.4638***	-.7186***	-.4794***	-.4913***	-.1874	-.3235*
LFGROWTH	.3409*	.3282*	.6310***	.4386**	.6443***	.3542*	.2862	.3629*	.3506*	.4867***	.3939*
LGNPCAP	-.6885***	-.3352*	-.7319***	-.2897*	-.5754***	-.7177***	-.8678***	-.6352***	-.4470***	-.2858*	-.4426***
LNINFLAT	.1414	.1258	.1754	.1388	.1483	.0510	.0622	.1292	-.2617	.3453*	-.0361
LNUSMIL	-.2812*	-.2262	-.3902***	-.2545	-.3684***	-.2524	-.3659*	-.2656	-.1754	-.1754	-.1691
LNVISAWA	.4739***	.4321***	.3732***	.4118***	.2375	.4607***	.1502	.2544	.1929	.2582	.0982
MILES	-.0668	-.4589***	-.1335	-.6124***	-.1816	-.1060	.3301*	.3316*	.7054***	-.6943***	.0846
PRICONS	-.1780	-.3617*	-.2867	-.4718***	-.3338*	-.2761	-.0708	.1052	.4457***	-.4520***	.2369
UNEMPLOY	.3930*	.4418***	.2670	.3556*	.2608	.3281	.1988	.1154	-.1112	.2582	.0970
URBGROW	.5587***	.3424*	.6814***	.2990*	.6603***	.6047***	.6990***	.4634***	.4347***	.3273**	.5158***

Minimum pairwise N of cases: 45   1-tailed Signif: * - .01   ** - .001

Table A3. Correlation Matrix for Dependent and Independent Variables--Continued

Correlations:	FBPROPLF	FBNATIVE	FOODPRO	GNP8085	GNP8575	LFAVED	LFGROWTH	LNGNPCAP	LNINFLAT	LNUSMIL	LNVISAW
LNOVRATE	.0949	.1792	-.2456	-.2285	-.1143	-.5323**	.3409*	-.6885**	.1414	-.2812*	.4739**
LNOVRATP	.2347	.5574**	-.3984***	-.3978***	-.2618	-.2648	.3282*	-.3352*	.1258	-.2262	.4321**
LNLERATE	-.0248	.0702	-.5280***	-.3412*	-.1320	-.6519**	.6310***	-.7319***	.1754	-.3902**	.3732**
LNLERATP	.2762	.5822***	-.5936***	-.4457***	-.2548	-.1515	.4386***	-.2897*	.1388	-.2545	.4118**
LNAPRATE	-.0064	.0067	-.4823***	-.3853***	-.1307	-.5652**	.6443***	-.5754***	.1483	-.3684***	.2375
REFURATE	.1441	.1785	.3525*	.2634	.0575	-.4638***	.3542*	-.7177***	.0510	.2524	.4607**
AGGDP	-.0940	-.2933	.1922	.1110	.0963	-.7186***	.2862	-.8678***	.0622	-.3659*	.1502
CIVRIGHT	-.2263	-.3159*	-.0753	.0263	-.0651	-.4794***	.3629*	-.6352***	.1292	-.2656	.2544
DUMAA	-.4970**	-.3427*	.1893	.2806	.0841	-.4913***	.3506*	-.4470***	-.2617	-.1754	.1929
DUMLA	.1918	.4228***	-.5638***	-.5579***	-.3472*	-.1874	.4867***	-.2858*	.3453*	-.1754	.2582
EMPMANUF	-.1819	.1616	-.2254	-.1386	-.1547	-.3235*	.3939*	-.4426**	-.0361	-.1691	.0982
FBPROPLF	1.0000	.3477*	-.1209	.0580	.0665	.2533	-.4500***	-.0510	.1254	.2032	.1776
FBNATIVE	.3477*	1.0000	-.3233*	-.2852*	-.2241	.1800	.0383	.0752	-.1080	-.1020	.1762
FOODPRO	-.1209	-.3233*	1.0000	.5445***	.1919	.2500	-.4295***	.3137*	-.2184	.1723	-.1264
GNP8085	.0580	-.2852*	.5445***	1.0000	.6463***	.1909	-.3273*	.1927	-.3496*	.0266	.0982
GNP8575	.0665	-.2241	.1919	.6463***	1.0000	.0519	-.2484	.0290	-.0933	-.0865	.0202
LFAVED	.2533	.1800	.2500	.1909	.0519	1.0000	-.5496***	.7753***	.0372	.2182	-.3092*
LFGROWTH	-.4500***	.0383	-.4295***	-.3273*	-.2484	-.5496***	1.0000	-.4855***	.1195	-.2518	.4218***
LNGNPCAP	-.0510	.0752	.3137*	.1927	.0290	.7753***	-.4855***	1.0000	-.1396	.3041*	-.4134***
LNINFLAT	.1254	-.1080	-.2184	-.3496*	-.0933	.0372	.1195	-.1396	1.0000	-.1664	.1302
LNUSMIL	.2032	-.1020	.1723	.0266	-.0865	.2182	-.2518	.3041*	-.1664	1.0000	-.0289
LNVISAWA	.1776	.1762	-.1264	.0982	.0202	-.3092*	.4218***	-.4134***	-.1302	-.0289	1.0000
MILES	-.3425*	-.5048***	.3520*	.4772**	.2258	-.1128	-.0282	-.1194	-.1673	-.0542	-.0761
PRICONS	-.2441	-.3298*	.5293***	.7029***	.2734	.0829	-.0099	.0614	-.2383	.1548	.1642
UNEMPLOY	-.0565	.3416*	-.4362***	-.3715*	.2230	-.3456	.3002	-.2224	.1911	-.2338	.0591
URBGROW	-.3752*	-.0799	-.4502***	-.4279***	-.2154	-.7561**	.7213***	-.7365***	.2401	-.3734*	.2556

Minimum pairwise N of cases: 45   1-tailed Signif: * - .01   ** - .001

Table A3. Correlation Matrix for Dependent and Independent Variables--Continued

Correlations:	MILES	PRICONS	UNEMPLOY	URBGROW
LNOVRATE	-.0668	-.1780	.3930*	.5587**
LNOVRATP	-.4589**	-.3617*	.4418**	.3424*
LNLERATE	-.1335	-.2867	.2670	.6814***
LNLERATP	-.6124***	-.4718***	.3556*	.2990*
LNAPRATE	-.1816	-.3338*	.2608	.6603***
REFURATE	-.1060	-.2761	.3281	.6047***
AGGDP	.3301*	-.0708	.1988	.6990***
CIVRIGHT	.3316*	.1052	.1154	.4634***
DUMAA	.7054***	.4457***	-.1112	.4347**
DUMLA	-.6943***	-.4520***	.2582	.3273*
EMPMANUF	.0846	.2369	.0970	.5158***
FBPROPLF	-.3425*	.2441	-.0565	.3752*
FBNATIVE	-.5048***	-.3298*	.3416*	.0799
FOODPRO	.3520*	.5293***	-.4362***	-.4502***
GNP8085	.4772***	.7029***	-.3715**	-.4279***
GNP8575	.2258	.2734	.2230	.2154
LFAVED	-.1128	.0829	-.3456	-.7561**
LFGROWTH	-.0282	-.0099	.3002	.7213**
LNGNPCAP	-.1194	.0614	-.2224	-.7365**
LNINFLAT	-.1673	-.2383	.1911	.2401
LNUSMIL	-.0542	.1548	-.2338	-.3734*
LNVISAWA	-.0761	.1642	.0591	.2556
MILES	1.0000	.5056***	-.3429*	.0977
PRICONS	.5056***	1.0000	-.5673***	-.1829
UNEMPLOY	-.3429*	-.5673***	1.0000	.3678**
URBGROW	.0977	-.1829	.3678**	1.0000

Minimum pairwise N of cases: 45   1-tailed Signif: * - .01   ** - .001

31

BIBLIOGRAPHY

Commission for the Study of International Migration and Cooperative Economic Development (CSIMCED). 1988. "Determinants of Unauthorized Emigration from the Western Hemisphere to the United States: An Empirical Study." Draft.

International Labour Office (ILO). 1987. Year Book of Labour Statistics 1987. 47th issue. Geneva.

Kraly, Ellen Percy and Robert Warren. 1989. "Length of Stay of Temporary Migrants and the Concept of Long-term Immigration to the United States." Paper presented at the meeting of the Association of American Geographers. March. Baltimore.

Massey, Douglas S. 1988. "Economic Development and International Migration in Comparative Perspective." Prepared for the Commission for the Study of International Migration and Cooperative Economic Development.

Official Airline Guides (OAG). 1986. Official Airline Guide. Worldwide Edition. October. Oakbrook, Illinois.

Portes, Alejandro. 1988. "Unauthorized Immigration and Immigration Reform: Present Trends and Prospects." The Johns Hopkins University. Prepared for the Commission for the Study of International Migration and Cooperative Economic Development. Unpublished.

Psacharopoulos, George and Ana Maria Arriagada. 1986. "The Educational Composition of the Labour Force: An International Comparison," International Labour Review 1986. Vol. 105, No. 5, September-October. Geneva.

Republic of China Directorate-General of Budget, Accounting and Statistics (RPDBAS). 1987. Statistical Yearbook of the Republic of China 1987. Taipei.

Taylor, Charles Lewis and David A. Jodice. 1983. World Handbook of Political and Social Indicators. Vol. I. Cross National Attributes and Rates of Change. Third edition. New Haven.

United Nations Educational, Scientific, and Cultural Organization (UNESCO). 1986. Statistical Yearbook 1986. Paris.

U.S. Bureau of the Census (USBC). 1984. "Foreign-Born Immigrants in U.S. 1980 Census of Housing and Population." Unpublished tabulations.

_____. 1986. "The INS Nonimmigrant Information System: Assessing the Statistics on Nondeparture," by Robert Warren, Second Annual Research Conference. March 23-26, 1986. Proceedings. Washington, D.C.

34

_____. 1987. <u>World Population Profile: 1987</u>. Washington, D.C.

_____. 1988a. "Determinants of Overstay Rates for U.S. Nonimmigrants, by Country of Citizenship," by Linda S. Peterson and Robert Warren. Unpublished.

_____. 1988b. International Data Base. Center for International Research. Washington, D.C.

U.S. Central Intelligence Agency (CIA). 1988. <u>The World Factbook 1988</u>. Washington, D.C.

U.S. Department of Defense (USDD). 1987. <u>Military Manpower Statistics</u>. Washington, D.C.

U.S. Department of State (USDS). 1986. "Active Immigrant Visa Applicants Registered at Consular Offices as of January 1986." Unpublished data.

U.S. Immigration and Naturalization Service (INS). 1988a. "Estimated Legalization Applications (I-687) By Countries of Citizenship." Unpublished.

_____. 1988b. "Nonimmigrants by Country of Citizenship and Status. Fiscal Years 1985 and 1986." May 24 and June 15, 1988. Unpublished.

_____. 1988c. "Servicewide Apprehensions, by Country of Citizenship for Aliens Who Have Resided in the U.S. for More than 72 Hours. Fiscal Year 1987, and Fiscal Year 1988 October-July." October 7, 1988. Unpublished.

World Bank (WB). 1987a. <u>World Development Report 1987</u>. Washington, D.C.

_____. 1987b. <u>World Tables 1987</u>. The Fourth Edition. Washington, D.C.

_____. 1988a. Unpublished data.

_____. 1988b. <u>World Development Report 1988</u>. Washington, D.C.