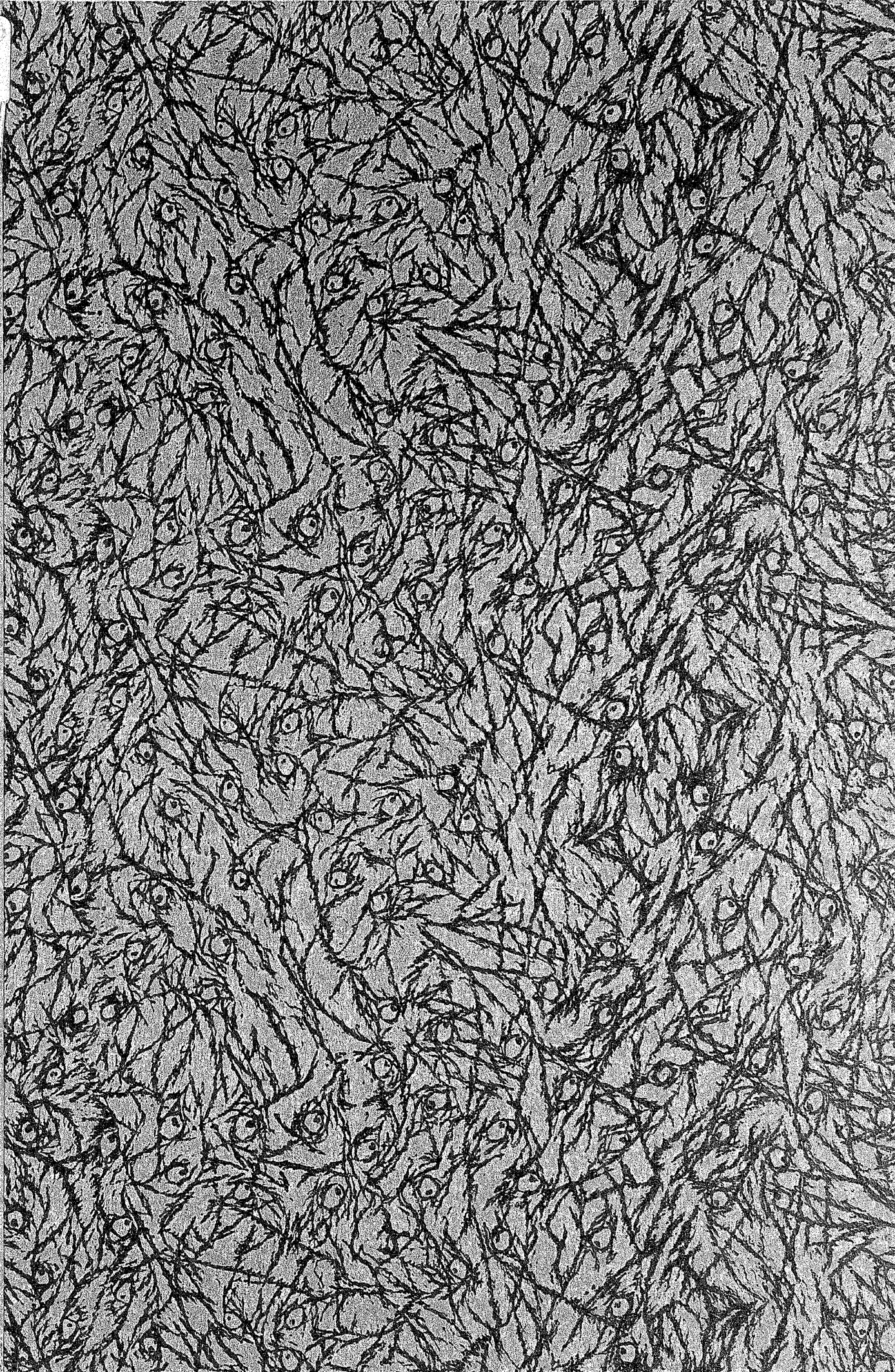


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HISTORICAL MIGRATION PATTERNS AND CURRENT  
TEMPORARY MIGRATION: THE CASE OF  
MEXICAN MIGRATION TO THE U.S.

by

Susan I. Ramey  
Sherrie Kossoudji



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Discussion Paper No. 107

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THE CASE OF MEXICAN MIGRATION TO THE U.S.

by  
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and  
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## ABSTRACT

Although the demand for low skilled labor in the United States has long been identified with the flow of migration from Mexico, the associated supply conditions of this migration remain a relatively neglected topic of research. Using a national migration survey (ENEFNEU), three determinants of the propensity for individual temporary migration from Mexico to United States are examined: individual characteristics, structural characteristics of the region of origin, and historical migration patterns. The levels and changes in patterns of temporary migration during the 1974-78 period are investigated, including consideration of the development of new source regions in Mexico. Previously developed migration networks are found to play a key role in explaining more current patterns of temporary migration.

## RESUME

Alors que la demande en main d'oeuvre non-spécialisée aux Etats-Unis s'identifie depuis longtemps avec la migration provenant du Mexique, l'offre associée à cette migration est toujours relativement négligée comme sujet de recherche. Seront employés les résultats d'une enquête nationale sur la migration (ENEFNEU) pour examiner trois facteurs explicatifs de la propension à la migration individuelle et temporaire du Mexique vers les Etats-Unis. Ces trois facteurs sont: caractéristiques particulières, caractéristiques structurales de la région d'origine, mouvements migratoires historiques. Seront analysés les taux de migration temporaire et les changements des tendances migratoires sur la période de 1974 à 1978. Cette analyse tiendra compte du développement de nouvelles régions de départ au Mexique. Il s'avère que les réseaux de migration formés antérieurement constituent l'un des principaux facteurs qui déterminent les tendances plus récentes de la migration temporaire.





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## I. INTRODUCTION

What determines the propensity of Mexicans to migrate temporarily (and repeatedly) to the U.S.? An individual's characteristics and the structural characteristics of the region of origin clearly influence the decision to migrate through their roles in shaping economic opportunities. In addition past individual and structural factors have promoted the development of an extensive migration network in some regions. These high levels of migration have themselves increased mobility; the more established migration as part of the socioeconomic system is, the more likely that any given individual will migrate. To what extent do these historical migration patterns themselves account for the current propensities of temporary migration to the United States?

After reviewing state-level characteristics of sending regions in Mexico, the three sets of factors promoting migration listed above are integrated in a reduced form logit analysis of the propensity to migrate at the individual level. Levels and changes in patterns of temporary migration during the 1974-78 period, including the development of new source regions in Mexico, are examined. The data come from the 1970 Mexican census and from ENEFNEU, a national Mexican migration survey conducted by CENIET of the Mexican government.<sup>1</sup> The subsample of the ENEFNEU data used here is unique because it captures a broad regional perspective on individual temporary migration -- whether documented or undocumented. However, with this subsample we do not attempt to address the question of the number of Mexican migrants in the United States. Instead, we concentrate on the regional sources within Mexico

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<sup>1</sup>The Encuesta Nacional de Emigración a la Frontera Norte del País y a los Estados Unidos (ENEFNEU) is a national migration survey that was conducted by the Centro Nacional de Información y Estadísticas del Trabajo (CENIET), the statistical branch of the Ministry of Labor in Mexico.

of temporary migration, and focus on conditions and events in Mexico that may affect temporary migration. Specifically, given that a Mexican male has been to the U.S. at least once in the recent past and has returned to Mexico, what determines the propensity for migration at specific points in time and over a five-year interval?

Research on temporary migration in Mexico is growing but has been beset by two major problems. Undeniably, temporary migration is inherently difficult to analyze. Most theories of migration address lifetime moves, failing to address the decision to return. Data are frequently available at only an aggregate level — and do not measure length of stay, or even the number of individuals involved. New theoretical advances, individual level data, and exploratory studies of the phenomenon are only recently forthcoming. Secondly, the unsanctioned status of many migrants has made data collection difficult, at least from the United States' side of the border.

Thus, as a response to these difficulties, the past ten years have seen a burst of case studies in Mexico. Their purpose has been to assess the individual determinants of migration to the United States [see, for example, Cornelius (1976, 1978); Cornelius and Diez-Canedo (1976); Dinerman (1978, 1982); Mines (1981); Reichert and Massey (1979, 1980); and Wiest (1973)]. These studies have provided much evidence on the general characteristics of the migrating population. All agree that temporary migration characterizes this migratory phenomenon. Cornelius (1978: p. 25) found that among families with some history of migration to the U.S. from 1930 to 1976, temporary migrants outnumber those who settled permanently by a margin of 8 to 1. Reichert and Massey (1979: p. 613) found that most migration to the U.S. was seasonal; migrant groups comprised of documented workers returned after an average 9.4 months while the average of undocumented workers was 12.4 months.

All studies reveal, as well, the household orientation of migration. Dinerman (1978: p. 494) suggests that each household attempts to maximize its security and minimize severe economic losses. The presence of candidates for migration will depend on the number and ages of the people present in the household (Wiest, 1973: p. 201), while the availability of labor to substitute for the migrant will depend on the number of people in the household, the age and sex structure of the household, and on the sexual division of labor.

Mostly men migrate (Cornelius, 1978: p. 19), but women are becoming a more important component of migration patterns (Reichert and Massey, 1979: p. 7). Migrants are likely to be employed in unskilled jobs in agriculture or

services, are rural in origin, and tend to be within the bottom half — though not at the very bottom — of the income distribution of their home community (Cornelius, 1978: p. 21).

Most of the locations of these case studies were chosen specifically because there was a long-standing tradition of migration to the U.S. in that area. Cornelius and Diez-Canedo (1976) note that temporary migration from the Los Altos region of Jalisco dates back to at least 1884 when the railroad link to El Paso was completed. Individuals began migrating for seasonal work as early as 1911 in Reichert and Massey's (1979, 1980) study community in Michoacán. Richard Mine's (1981) study community, Las Animas, Zacatecas, has a "deeply rooted tradition of cross-border migration" which began primarily in the 1920's.

An advantage of these choices in location is that the intensive nature of the migration makes its patterns more visible. A disadvantage of case studies, however, is that it is difficult to evaluate the structural conditions associated with migration. The Mexican economy has never been homogeneous. Economic opportunities and alternatives differ not just among households within an area, but may vary dramatically across regions of the country. Information costs about other labor markets and local migration histories also differ systematically across Mexican states. What are their dynamics that propel these differences, and how important are they in determining propensities of out-migration?

There is, and nearly always has been, a distinct regional pattern of migration to the United States. Carlos Zazueta (1980: p. 45) succinctly sums up the issue:

Just as the most hotly debated aspect of the phenomenon of Mexican migration is that of volume, the least debated aspect and the most widely accepted is that of the place of origin of these people...There are relatively few states that contribute the majority of the elements in Mexican international migration...It appears that one of the possible factors contributing to this pattern of migration is tradition.

The Central Plateau region (consisting of the states of Durango, Guanajuato, Jalisco, Michoacán, San Luis Potosí, and Zacatecas) has long been identified as the major sending area. Four states from the Central Plateau contributed 41 percent of all the temporary migrants in the ENEFNEU sample, but only 16 percent of the total population of Mexico (in 1970). These same four states accounted for an estimated 54 percent of the migrating population in 1924 (Foerster, 1925).

There are at least three sources for this regional persistence. One is that the individuals from those regions have particular individual characteristics conducive to migration. Secondly, migration may continue from these areas because the relative structural characteristics of regions have remained constant over time (with perhaps the exception of the border zone). The income distribution, the level of income, the percent of the labor force working in agriculture, and the land tenure systems since the revolution — all of which have been linked to migratory characteristics — have a specific regional pattern.

The third explanation results from the historical process of migration. As discussed in the following section, recruitment efforts (by U.S. employers) have focused on a few particular states in Mexico. This migratory experience, on both the regional and individual levels, may affect the probability of future migration in a number of ways. Previous work experience in the U.S. may increase expected wages, as well as reduce future search costs. In addition, experience crossing the border is likely to reduce the probability of apprehension and perhaps decrease the need for a "coyote's" services in border crossing. Time in the U.S. generally increases the chance of attaining a legal status, which further increases labor market opportunities and decreases the costs of temporary migration. Also, migratory experience influences social norms, and may increase mobility; both the migrant and those remaining at home are now more experienced at dealing with the separation, and migration of one family member may be more socially acceptable. High levels of previous migration from the region of origin may have a similar effect, even if a given individual does not participate. A migration network is developed, reducing costs and increasing expected gains to migration for all individuals from that area. Contacts in the U.S. are established and information about the U.S. labor market as well as border crossing is passed back to the Mexican community. Thus, an established migration network can shift the entire supply function of labor migrants from a given area.

A secondary impact of past migration is through remittances and savings brought back from the U.S. Conflicting roles are cited in the literature. First, these remittances are likely to raise the standard of living of the family. It may be preferable to repeat migration rather than adjust to a lower income level. Again, the regional impact is similar — if some are seen to have a higher standard of living (due to remittances), this may induce neighbors to migrate. However, remittances and saving may have the reverse



effect through the following mechanism: the increment in income may be invested in productive assets in Mexico, thereby (perhaps) increasing the returns to labor in Mexico for the previous migrant and possibly others in the community. This reduces the incentive for future migration.

An important but analytically elusive point is the distinction between temporary and permanent migration. In this study only return migrants in Mexico are examined, and we hypothesize that an increase in the net returns to being in the United States increases the probability of temporary migration. It should be noted that this is not necessarily true, although it does seem to be supported empirically. With an increase in the net benefits of being in the U.S., some may choose to migrate temporarily rather than not migrate at all, but some may choose to migrate permanently rather than temporarily. Only a complete examination of the long-term development of migration networks and their characteristics can help to understand the transition from temporary to permanent migration, which is beyond the scope of this paper.

Several of the case studies cited earlier did inquire into the nature of the long run dynamics of a migratory network. Over time, as a network develops, there will be corresponding adjustments in the migratory patterns associated with that network. Mines (1981) identifies these adjustments in his analysis of the maturation of the network in one village. First, he notes that among the pool of migrants, the average length of stay per year grows longer in the U.S. and shorter in Mexico. Closely associated is the fact that the proportion of temporary migrants among total migrants declines over time. Although network migration is a male-led phenomenon, he found that maturation led to women becoming a greater percentage of total U.S. migrants and that a higher percentage of women migrate without documents. The use of a legal contract labor system induces a corresponding flow of undocumented migration. Finally, legalization of status and age of first entry tend to occur at a younger age among men in very mature networks.

A number of relevant questions arise when applying these observations to a national study. Are these village-level observations evident in state-level aggregated data? If so, what state-level characteristics are associated with the highest intensity of temporary out-migration? Can young migration networks be identified on the state level? Changes in the intensity of out-migration over time, the female composition of the migration, out-migration during the Bracero period (1942-63), and the average number of years the migrants go to the U.S. help to identify potential new networks.

These issues are addressed in part IV of this paper, following a section devoted to historical background on temporary migration, and a brief description of the data used.

The microeconomic analysis of part V examines the following issues: What are the sources of these state-level differences in temporary migration characteristics? Are they due to certain individual or demographic characteristics prevalent in the state, continuing patterns of poverty, or networking patterns over time using micro-level data? Five years of individual migration history data are used to examine patterns in temporary migration during the 1974-78 period. We use a reduced form logit model to identify changes in those patterns, particularly following the 1976 economic crisis in Mexico, and to make predictions about the probability of migrating in each of five years according to the individual, state, and networking variables.

## II. HISTORICAL MIGRATION PATTERNS

The migration of Mexican workers to the U.S. is unique in both its size and duration. It is the result of a century punctuated with fluctuating but evergrowing demand for cheap labor in the United States combined with economic and political uncertainty in Mexico.<sup>2</sup> Temporary workers dominate the migration stream and over time there has been an increasing proportion of undocumented migrants. Unseen in any of these aggregate statistics is the domination of a few Mexican states producing the migrants. Table I shows the eight states sending the largest percentage of migrants to the U.S for several periods. Although the methods of measurement and the kinds of migrant populations differ, the historical constancy of the regional pattern of migration is startling. What accounts for this persistence in regional patterns? Here we focus on the migration histories and economic developments in the relevant regions of Mexico for three basic periods: the pre-World War II period, the Bracero period (1942-63), and from 1965 through the end of our research period, 1978.

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<sup>2</sup> We recognize the importance of demand conditions in the United States in determining the quantity of migration across the border but believe that it has a much less significant influence on the source regions of Mexico. Recruitment activities, of course, which are functions of U.S. demand, do affect the source regions and play an important role in our analysis.

TABLE I

THE EIGHT LARGEST SENDING STATES OF MEXICO:  
TIME TRENDS OF PERCENT OF MIGRANTS TO THE U.S.

State	1924	1926	1953- 1954	1969	1978a	1978b	1978c
Jalisco	20.0	14.7	11.0	7.5	13.9	14.3	8.3
Michoacán	14.5	20.0	9.8	8.3	8.4	17.6	*
Guanajuato	10.8	19.6	11.9	8.3	17.9	10.8	14.0
Zacatecas	9.0	4.8	11.5	6.9	11.8	6.9	14.5
Durango	5.8	5.9	12.3	9.9	4.4	4.9	*
Chihuahua	4.7	4.4	*	18.5	12.6	11.2	21.1
San Luis Potosí	3.3	*	4.8	7.3	5.0	3.9	4.1
Nuevo Leon	*	8.0	*	6.1	*	*	*
Distrito Federal	*	5.0	*	*	*	*	4.9
Baja California	*	*	*	*	5.0	3.9	4.2
Hidalgo	*	*	*	*	*	*	4.6
Total*	68.1	82.4	61.3	72.8	79.0	73.5	75.7

NOTE: \*Indicates that particular states was not one of the top 8 sending states during that period. These states are excluded in the calculation of the Total.

SOURCES: 1924 (7 states): Foerster (1925).  
 1926 (8 states): Estimated on the basis of money orders sent to the U.S. (Gamio, 1930: p. 13).  
 1953-54 (6 states): Legally contracted bracero workers (taken from Lazaro Salinas, La Emigracion de Braceros, cited in Cross and Sandos, 1981: p. 44).  
 1969 (8 states): Based on interviews with 493 wetbacks (Samora, 1971: p. 92).  
 1978a (8 states): Family reported migrants in the U.S. from the ENEFNEU National Survey, in Zazueta (1980).  
 1978b (8 states): Border survey estimates, in Bustamante and Martinez (1979: p. 268).  
 1978c (8 states): Estimates for ENEFNEU return migrants.

#### A. Migration from the Late 1800's to World War II

The Mexican states of Guanajuato, Jalisco, Zacatecas and Michoacán, although far from the U.S. border, have been identified as major migration centers since the late 1800's. Cardoso (1980: p. 6-7) points to the large percentage of haciendas, or large privately owned estates, in this region and the enclosure movements (which effectively destroyed the traditional ejido system) as the initial impetus to out-migration. By 1910, landownership was highly concentrated. Ninety-seven percent of the rural families in Guanajuato, 96 percent of the families in Jalisco, 97 percent of the families in Michoacán, and 98 percent of the families in Zacatecas owned no land. Income, highly dependent on agricultural output followed a similarly unequal pattern of distribution.

Population growth over the previous 20 years, combined with the lack of land, led to an overwhelming labor surplus and depressed already low real wages. It is not surprising that in 1910 these four states were also amongst those with the highest rate of out-migration. It is estimated that 10.7 percent of the population of Zacatecas emigrated in 1910, while emigration rates for Guanajuato, Jalisco, and Michoacán were 9.8 percent, 9.3 percent, and 4.6 percent, respectively (Cardoso, 1980: p. 12).

This early propensity to migrate was stimulated by the railroad development between the central region and northern Mexico and the wage disparities between the two regions. Railroad labor recruiters operated extensively in the central region from 1890 to 1910. Mexican workers first worked in Mexico's northern border areas and then were recruited by American companies (at twice the border wage) to replace politically unpopular Oriental workers on the railroads, mines, and farms (Martinez, 1957: p. 5, 12).

Emerging networks facilitated the continuation of a stream of migration from the central area: "by word of mouth or through letters from relatives, peones (laborers) in central Mexico learned quickly of the relatively high wages that were available [in the U.S.]" (Cardoso, 1980: p. 26). Yet, in spite of such income disparities, braceros migrated temporarily. Migration mounted in the spring, when agricultural demand grew, and declined in the autumn. February to October were the peak migratory months (Cardoso, 1980). Most migrants, either because of lack of work or climatic conditions, returned home for the winter.

The revolution of 1910-1920 propelled migration from all Mexican states and spurred this migration directly to the U.S. rather than to northern Mexico or to the cities. But its agrarian base served to focus the flow from the Central Plateau. The Cristero Rebellion, a three-year period of intense violence, took place almost exclusively in the Central Plateau and was especially prominent in Jalisco and Michoacán. Critical food shortages and prices that rose 300 percent faster than wages were the result of the protracted violence and rural instability (Cardoso, 1980: p. 73).

Mexican industry offered no relief and the two stagnating sectors combined to produce Central Plateau migrants:

Manufacturing productivity stagnated until the late 1920's because of the violent shocks of the first decade of the revolution, continuing labor strife and lack of investment capital. Per capita agricultural production fell 18 percent from 1907 to 1929; in absolute terms Mexico grew 40 percent less corn and 31 percent less beans in 1929 than in 1907. The heavily populated central states suffered proportionately larger declines and thus continued to provide the largest share of the emigrants to the U.S. (Cardoso, 1980: p. 73-74).

Land redistribution, intended to stabilize the rural areas, had instead a destabilizing impact. Agricultural productivity remained low, organized labor markets disappeared and newly distributed land was of poor quality and was distributed in parcels that were too small for technological improvements to be useful. The number of hectares per recipient varied dramatically — from 362.7 in Quintana Roo to 1.5 in the Distrito Federal. The central states averaged 8.8 hectares per recipient (Whetten, 1948: p. 149).

Table II clearly illustrates the distribution of land as of 1940. Twenty-six percent of the landowners in the central region had holdings of less than one hectare, while 28 percent of the land was on farms of greater than 1,000 hectares and was accounted for by only 0.1 percent of the landholders. The Central Plateau Region also had the most ejido land. Thirty-eight percent of the land was ejido, or communally owned property. Each ejidatario had an average of 8.5 hectares, with an average of 3.5 suitable for cropland. Maldistribution was a serious problem all over Mexico, but was particularly endemic in the central region.

The Great Depression years put a quick halt to nearly all migration from Mexico. Massive voluntary and involuntary repatriation spread the news of hard luck in the U.S. At most, only a few thousand laborers crossed the border to the U.S. in 1932 compared with almost 200,000 workers who went back to Mexico in the same year. This pattern continued throughout the 1930's (Cardoso, 1980: p. 148).

TABLE II  
DISTRIBUTION OF LAND BY TYPE OF OWNERSHIP AND REGION: 1940

Size of Holdings (hectares)	North Pacific		North		Central		Gulf		South Pacific		Total	
	Land (%)	Holdings (%)	Land (%)	Holdings (%)	Land (%)	Holdings (%)	Land (%)	Holdings (%)	Land (%)	Holdings (%)	Land (%)	Holdings (%)
Less than 1	.01	2.50	.01	5.40	.70	25.50	.10	9.90	.10	15.40	.10	17.60
1 - 5	.30	10.10	.20	11.50	2.90	15.40	.60	12.80	1.40	25.10	.70	15.30
5 - 50	1.40	9.40	1.60	11.70	7.60	5.10	4.30	12.20	2.30	5.20	2.70	7.20
50 - 1000	11.10	3.80	9.10	5.50	22.80	1.50	14.10	3.90	13.60	2.50	12.20	2.70
1000 - 40000	53.50	1.23	40.00	1.10	20.80	.11	32.00	.43	32.90	0.25	36.90	.33
Over 40000	13.50	.02	29.80	.04	6.80	.00	26.20	.01	31.90	0.01	25.00	.01
Private Holdings	79.80	24.90	80.60	35.40	61.60	47.60	77.30	37.10	82.20	48.40	77.60	43.20
Ejidos	20.20	75.10	19.40	64.80	38.40	52.40	22.70	62.90	17.80	51.60	22.40	56.80

NOTE: Composition of Regions:

North Pacific: Baja California Norte; Baja California Sur; Sonora; Sinaloa; Nayarit.

North: Chihuahua; Coahuila; Nuevo Leon; Tamaulipas; Durango; Zacatecas; San Luis Potosí.

Central: Aguascalientes; Jalisco; Michoacán; Guanajuato; Queretero; Hidalgo; Mexico, D.F.; Morelos; Tlaxcala; Puebla.

Gulf: Veracruz; Tabasco; Campeche; Yucatan; Quintana Roo.

South Pacific: Colima; Guerrero; Oaxaca; Chiapas.

SOURCE: Whetten, 1948, pp. 177 and 592.

## B. World War II and the Bracero Period

World War II created a labor shortage in the U.S. and the strong demand for labor reinitiated a mass migration. Why, after nearly a decade of inactivity, did the migration resume from precisely those same areas? Two factors played an important role: the drive to modernization and the Green Revolution promoted regional inequality, while labor recruitment, activated by U.S. employers, was selective by region.

The allocation of investment to irrigation projects accompanied the Mexican government's drive toward agricultural modernization and export cropping in the 1940's. Investments were made where returns were highest: in northern Mexico and along the Pacific coast. The four states of Baja California, Sinaloa, Sonora and Tamaulipas received 47.2 percent of all public funds for new irrigation lands despite the fact that the four states contained only 9.3 percent of the nation's population. The central states of Durango, Guanajuato, Jalisco, Michoacán, San Luis Potosí and Zacatecas received only 15 percent of irrigation investment even though they had 25 percent of the population (Cross and Sandos, 1981: p. 22 & App. 3). Access to water, as well as credit and fertilizer, were keys to access to the technologies of the Green Revolution. Thus, the small and often ejido farms of the Central Plateau were largely excluded from the gains of new innovations.

Output growth was limited in the Central Plateau, while at the same time World War II created labor shortages in the agricultural sector of the U.S. An international agreement between the two governments formalized recruitment in 1942. Regulations concerning recruitment were imposed by the Mexican government: "Workers, for example, can only be recruited from certain states and areas in Mexico...Recruitment in the northern states has been subject to special restriction because there seemed to be a tendency for workers to be drained off in large numbers" (R.C. Jones, cited in Whetten, 1948: p. 267). The Bracero period was underway.

Recruitment from 1942-1944 focused on the Central Plateau. The six major sending states defined earlier directly supplied over 56 percent of the recruits. [See Table III.] Fourteen percent of the workers were recruited from Guanajuato, 24.8 percent from Michoacán, 6 percent from Jalisco, and 5.5 percent from Zacatecas. Mexico City accounted for 31.6 percent of the recruitment, but few of those recruited there actually resided in the capital. Most of these workers came from the same surrounding states.

TABLE III

## STATE-LEVEL DATA ON TEMPORARY OUT-MIGRATION

STATE	INTENSITY	IN U.S.					BRACERO	AVE. YEARS	% FEMALE	RECRUIT	POP.GROWTH (%)
		1974	1975	1976	1977	1978					
<b>BORDER STATES</b>											
Baja California	105.5	56.0	63.8	73.7	74.6	66.5	25.00	3.22	28.70	.10	5.30
Chihuahua	231.0	76.3	65.9	82.7	102.6	150.0	19.60	2.08	12.76	.30	2.80
Coahuila	32.4	5.4	6.1	9.0	17.7	12.3	33.30	1.56	9.91	.30	2.10
Nuevo Leon	4.5	.7	.8	.7	2.2	2.0	5.20	1.43	1.62	.20	4.70
Sonora	20.1	3.0	2.9	2.1	4.8	15.5	1.40	1.41	7.17	.10	3.50
Tamaulipas	52.5	29.4	27.2	30.7	32.4	31.4	17.40	2.97	23.28	.30	3.70
Average	74.3	28.5	27.8	33.1	39.1	46.3	16.98	2.11	13.91		3.68
<b>TRADITIONAL SENDING STATES</b>											
Durango	73.9	14.3	9.6	14.4	25.3	50.0	15.10	1.63	.00	1.10	2.20
Guana juato	104.5	26.8	37.8	36.1	51.0	54.0	18.70	1.97	6.04	14.40	2.80
Jalisco	50.4	13.4	27.6	23.8	18.1	30.2	21.30	2.24	27.37	6.00	3.10
Michoacán	28.9	5.9	9.9	14.2	13.5	16.3	16.40	2.07	15.53	24.80	2.40
San Luis Potosí	57.9	12.2	13.1	15.6	23.1	46.0	12.00	1.91	14.82	5.60	2.10
Zacatecas	271.2	187.4	169.5	157.3	135.7	150.3	20.20	2.95	2.57	5.50	1.60
Average	97.8	43.4	44.6	43.6	44.4	57.8	17.28	2.13	11.06		2.37
<b>REMAINING STATES IN SAMPLE</b>											
Agascalientes	5.1	1.5	.4	2.0	.4	3.1	.00	1.45	18.39	1.70	3.40
Colima	130.4	27.9	46.9	.0	.0	55.7	.00	1.00	.00	.30	4.00
Distrito Federal	15.6	8.6	5.8	6.7	6.2	.0	.00	1.75	44.88	31.60	3.60
Guerrero	8.0	.5	.0	.0	7.1	6.0	5.90	1.68	24.72	.40	3.10
Hidalgo	59.6	8.5	17.0	8.5	25.6	51.1	.00	1.86	.00	.90	1.90
Mexico	9.8	.0	2.9	3.9	5.7	7.6	.00	2.05	1.40	2.50	7.30
Morelos	101.2	.0	42.3	42.3	29.4	58.9	.00	1.71	41.83	.60	4.80
Nayarit	26.5	13.0	10.0	11.5	6.9	13.8	13.60	2.08	18.84	.50	3.50
Sinaloa	12.5	3.5	4.8	6.5	4.0	7.9	46.10	2.14	32.32	.10	4.30
Average	41.0	7.1	14.5	9.1	9.5	22.7	7.29	1.75	20.26		3.99

SOURCES: INTENSITY = Weighted ENEFNEU return migrants/1970 Economically Active Population (in thousands).  
 IN US. (year) = Weighted ENEFNEU return migrants spending some time in U.S. that year/1970 Economically Active Population.  
 BRACERO = % of Weighted ENEFNEU return migrants making first trip to U.S. during the Bracero period.  
 AVE YEARS = Average number of years spending some time in U.S. (1974-78) for ENEFNEU return migrants.  
 % FEMALE = % of Weighted ENEFNEU return migrants who were female.  
 RECRUIT = % of total recruitment taking place in that state from 1942-44, from Whetten (1948:p. 269).  
 POP.GROWTH = Annual rate of population growth, 1960-70, reported by Mexican census.



The pattern of the sources of migration continued throughout the Bracero period. Cross and Sandos (1981: p. 44) report a minimum number of braceros sent to the U.S. by the six major sending states for the 1942-64 period. In 1942-44, 57.4 percent of the braceros came from the states of Durango, Guanajuato, Jalisco, Michoacán, San Luis Potosí, and Zacatecas. The percentage increased to 61.3 percent for the 1953-54 period, and dropped slightly to 51.4 percent in 1960-64. These legal migrant workers in turn influenced other male family members and neighbors, and prepared "a new generation of migrants who began entering the job market as the Bracero period formally came to an end" (Cross and Sandos, 1981: p. 44).

### C. Growth of Migration from 1965 to 1978

During this period undocumented migration mushroomed. Cross and Sandos (1981: p. 49) suggest that the traditional pattern of migration was maintained:

Mexico's rapid population growth and its inability to provide jobs for the new workers entering the labor force continued throughout the 1960's and 1970's. Although legally terminated on Jan. 1, 1965, the Bracero program simply went underground instead of disappearing.

But important changes were occurring in the Mexican economy. Border states were rapidly becoming very populous. Baja, California doubled its population from 1950 to 1960. Chihuahua, Tamaulipas, Sonora, and Nuevo Leon increased in population by one and one-half times. Border cities rapidly expanded. Tijuana's population was 16 times greater in 1967 than in 1940, Mexicali's was 12 times greater, and Juarez's more than 9 times greater (Samora, 1971: p. 133). Border crossing or commuting, which had always been part of the migration process, became a fully institutionalized system in the 1960's. Approximately 128,000 border crossing cards were issued in 1960. By 1969 the number had nearly tripled to 354,000. Meanwhile, agricultural production, which had begun stagnating in the 1960's slowed to a growth rate of 0.9 percent in the early 1970's (Cross and Sandos, 1981: p. 62).

The mid-1970's brought economic problems of crisis proportions to Mexico. Balance of payments problems, inflation, and continued unemployment took a strong toll on the economy. Government austerity measures were introduced in 1971, 1973, and 1976 (Cross and Sandos, 1981: p. 70). A major change in agricultural pricing policy occurred in the 1973-74 period. Products for internal consumption, particularly maize, were suddenly favored (UN, 1975: p. 276). Programs aimed towards social equity were introduced, including land

expropriation in the irrigated areas of Sonora (UN 1977: p. 324). However, a prolonged drought, social tensions, particularly in the northern states of Sonora and Sinaloa, and the overvalued exchange rate led to generally worsening rather than improved conditions.

Particularly hard hit by the overvalued exchange rate were the northern states. The assembly plants on the Mexican side of the border had undergone rapid expansion through 1974, but the overvalued exchange rate, combined with the recession in the U.S. and labor problems, led to a reduction in production in 1975 (Evans and James, 1979: p. 13). The agricultural sector was affected as well. Production in the northern irrigated areas was largely for exports, so that price disincentives were strong.

The peso was finally devalued in September 1976, for the first time in 22 years. Price and wage increases followed immediately, and the flight of capital persisted. Agricultural workers, not covered by the wage legislation but directly influenced by price changes, were disproportionately harmed by these events. In October the peso was refloated, and financial instability reigned throughout November (Clement and Green, 1978: p. 54). The general economic outlook began at last to improve in December, with administrative reforms, a new austerity program, and most importantly, the discovery that Mexico was oil-rich.

The economy, however, did not revive immediately. In 1977, real GDP per capita fell for the second consecutive year. But by 1978, due to some extent to oil revenues, this real growth rate was up again to a quite respectable level of 3.5 percent (IMF, 1981). Good fortune also fell on the agricultural sector when favorable weather conditions at last prevailed (UN, 1978).

Devaluation of the peso had a number of potential impacts on migration. Presumably economic conditions in the northern regions were improved, at last by 1978. Maize producers from the Central Plateau suffered a drop in the real price of output in the end of 1976, but a 52 percent increase in the guaranteed price of maize in 1977 postponed most of the decrease in the real price until 1978. By then it had fallen almost back to its 1972 level (Cross and Sandos, 1981: p. 67). However, the most important effect of the devaluation on migration was no doubt the dramatic change in the direct financial incentive. Remittances and dollars brought back from the U.S. would now go much further in Mexico.

In sum, incentives arose during the 1974-78 period that would suggest a number of trends in migration patterns. First, general economic conditions were worsening in Mexico through most of the period, implying a need to search for alternative sources of income. The 1976 devaluation made migration to the U.S. an attractive option for many potential migrants. The northern states and border area, previously leaders of economic growth, were relatively hard-hit during 1974-76. However, the border area most likely recovered quite substantially by 1978. The traditional sending area suffered from the 1974-76 drought, but benefited by the pricing policy for maize and other domestically consumed agricultural items. By 1978, however, these gains had been eroded away by inflation.

### III. DATA DESCRIPTION

The data used in the analysis comes from the return migrant portion of the ENEFNEU survey (Encuesta Nacional de Emigración al la Frontera Norte del País y a los Estados Unidos), collected by the Centro Nacional de Información y Estadísticas del Trabajo (CENIET) of the Mexican Secretaria del Trabajo y Prevision Social. The survey was done in December of 1978 and January 1979, when some 115 localities and 62,500 households were visited. December and January were chosen specifically because they were slack migrating months and because many individuals who migrate seasonally were home for the Christmas season. An in-depth questionnaire was used for a subsample of individuals who were in Mexico at the time of the survey, but who had been in the U.S. working or looking for work sometime during the preceding five years. Data for the respondents to the return migrant questionnaire are used here, consisting of a sample of 1,068 cases. Our sample, then, consists entirely of temporary migrants. Thus all conclusions are conditional on this sampling rule. The data set includes information on migration histories, state of residence in Mexico, as well as basic demographic information. Because of the limited understanding of female temporary migration, only data for males is used in the microeconomic empirical analysis presented here, resulting in a sample of 885 cases with complete information. CENIET has provided weights for the data to make aggregates comparable to the Mexican population. These weights were used in computing the state-level data.

## IV. MACRO-LEVEL EVIDENCE ON TEMPORARY MIGRATION IN THE 1970's

We begin the review of the state-level evidence by examining an aggregate measure of the intensity of temporary out-migration. This differs somewhat from the concept of the sources of migration. Here we are not concerned with overall quantity, but instead an average propensity for an economically active individual in Mexico to spend some time in the U.S. That is, how important are labor market opportunities in the U.S. (on average) to the labor force of a given Mexican state?

The intensity of temporary out-migration on the state level, INTENSITY, is derived by dividing the number of weighted ENEFNEU temporary migrants who had been to the U.S. in the last five years working or looking for work by the state economically active population in 1970 (measured in thousands). The INTENSITY of out-migration by state is reported in the second column of Table III. In many cases the intensity of out-migration corresponds to the historical sources of temporary migration discussed earlier. The simple averages over states are clearly highest for the traditional sending states — 97.8, compared with 74.3 for the border states and 46.1 for the remaining states in the sample.

Table III also summarizes the association of INTENSITY with other measures of the development of migratory networks. States are divided into three categories: the border states, traditional sending states, and all remaining states represented in the sample. The variables IN US. (1974 through 1978) measure the intensity of out-migration by year, rather than for the entire five-year period. They are equal to the weighted number of ENEFNEU return migrants having reported spending some working (or search) time in the U.S. during that year, divided by the 1970 state economically active population (in thousands). A general increase over time can be seen (partially due to the aging of the ENEFNEU sample), although this is not the case for all states. Another measure of the nature of the temporary migration is the number of years, out of the 1974-78 period, that the migrant spent at least some time in the U.S. (AVE YEARS). Note that this is not the same as the average amount of time spent in the United States during the five-year period. AVE YEARS is reported by state, along with the percentage of return migrants that are female (% FEMALE), and BRACERO, the percentage of return migrants who began

migrating during the Bracero period. Finally, RECRUIT represents the fraction of braceros recruited from that state in the 1942-44 period, and POP GROWTH is the annual population growth from 1960-70.

Generally, the averages for the three state categories correspond to the hypotheses concerning migration networks. As noted, the allocation of recruiting efforts during 1942-44 was by far the highest in the traditional sending states. And, these states have the highest average intensity of temporary out-migration for each year 1974-78, the highest AVE YEARS, and the highest percentage that began going during the Bracero period. This region is followed closely in these more recent measures by the border region. The remaining states' averages lag substantially behind.

Population growth rates follow a similar general pattern. Assuming that these growth rates reflect to some extent the amount of permanent out-migration (both internal and international), it appears that the traditional sending states had the highest rates of permanent as well as temporary out-migration during 1960-70. The remaining states have a high average population growth rate, but with lots of variation. For example, Baja, California and Nuevo Leon both have high rates of population growth (5.3 and 4.7 percent, respectively), but very diverse intensities of temporary out-migration (105 and 4.5, respectively). Similar contrasts can be found among nonborder states. This suggests that temporary out-migration may be qualitatively different in its motives from permanent migration.

Last, we can compare the growth of temporary migration by looking at percentage changes in IN U.S. (from 1974 to 1978). Again the results are not surprising. Old migration networks are not growing quickly in terms of temporary migration -- only a 37 percent change over the five years, although they may be growing in terms of permanent settlement. The intensity of temporary out-migration is growing more quickly in the border region, with a five-year rate of 63 percent. The remaining states have an impressive increase of 210 percent, with particularly large growth rates in the states of Guerrero, Hidalgo, and Morelos. This suggests that new networks may be forming in these nontraditional sending states.

One curiosity does arise in the computations. The percentage of temporary (working) migrants that are women during the five-year period diminishes rather than increases with the maturity of the network. Further understanding of female temporary migration, particularly as participants in the labor force, is clearly needed.

## V. MICROECONOMIC ANALYSIS OF THE INTENSITY OF TEMPORARY OUT-MIGRATION

We now turn our attention to the overall individual intensity of temporary migration for the five-year period (1974-1978) and the probability of migrating in each of the five years, with the role of migration networks and the state's economic environment incorporated into the microeconomic level analysis. The theoretical framework used is that of family-oriented welfare or utility maximization. We implicitly are comparing two options: expected utility given that no migration occurs, versus expected utility with some positive (optimal) amount of time spent in the U.S., recognizing that certain migration costs must be incurred. If expected utility with migration is higher, presumably migration occurs. A reduced form logit approach is used. Thus we ask what variables, assumed to be exogenous on the individual level, are key determinants of this expected utility differential.

To a large extent we focus on the standard economic variables thought to enter individual migration decisions: expected or implicit wages in both the sending and receiving areas, the costs of migrating, asset holdings and the need for cash, and noneconomic costs of being away from home (including attitudes towards migration). However, we recognize that these variables are functions not only of individual characteristics, but family characteristics, general economic conditions of the state of origin, and perhaps most importantly, the historical migration process itself. For example, the variables capturing the level of migration networking affect the utility differential in a number of important ways. The greater the experience and contacts, the higher is the expected wage rate in the U.S. and the lower the expected transportation and border crossing costs. In addition, this networking may directly reduce the disutility of being away from home through community development in the U.S. and the existence of the social norm of migration. It is also possible that previous remittance flows have increased the desire for consumption goods, making the high U.S. wage rate more attractive than ever. The impact of remittance flows as a deterrent to migration should also be noted. If these savings were invested, it might improve the expected wage rate in Mexico.

Within this framework we discuss the variables used in the analysis and their expected effects below; the methodology, empirical results, and predictions follows this section.

### A. Variable Description

We measure the intensity of temporary out-migration on the individual level as the percentage of years in the 1974-78 period in which some time was spent working or looking for work in the U.S. (% TOTAL). The dependent variables for the year-by-year analysis (THERE 78, etc.) are binary variables taking on the value of one if the individual spent some time working or looking for work in the U.S. during that year. Notation for all variables is summarized in Table IV.

As independent variables on the individual level, we consider primarily demographic data. These variables include AGE (in 1978), with three dummy variables for under 20, 30 to 45, and over 45 [YOUNG, MIDDLE, and OLD, respectively]. Since the data set selects for those who were in Mexico in 1978, but had migrated during the previous 5 years, the age variables are likely to capture some of the sample selection bias. That is, older members of the population are more likely to be part of a stable temporary migratory pattern. Younger members of the sample are more likely to be early stages of a migration cycle, leading in later years to permanence in either Mexico or the U.S.

Other individual-level variables include years of SCHOOLING, number of DEPENDENTS and OTHER FAMILY WORKERS in 1978, and, for the analysis of % TOTAL, the percent of years during the 1974-78 period that marital status is reported as SINGLE (including divorced, separated, and widowed). For the yearly analyses a dummy variable (SINGLE) is included, taking the value of one if the individual was single throughout that year. In studies of internal migration, propensities to migrate are often found to be higher amongst those with more education. However, this is generally not found in studies of Mexican migration to the U.S. Having a spouse, dependents, or other family workers may have conflicting effects. All represent ties to Mexico, and therefore suggest a direct incentive for staying in Mexico. But they also have implications for the family budget constraint; dependents and nonworking spouses suggest an increased need for income, while other family workers ease the income-earning requirements of the individual migrant. However, having other family workers also suggests a lower opportunity cost for leaving Mexico -- someone else is available to take over the day-to-day responsibilities. Being single presumably has the opposite effect of having dependents.

TABLE IV.

## VARIABLE DESCRIPTIONS

% TOTAL	Fraction of years in 1974-78 period in which some time was spent working or looking for work in the U.S.
THERE78	Binary variable equal to one if the individual spent some time working or looking for work in the U.S. during 1978 (similarly for THERE77, etc.).
AGE	Age in years in 1978. Dummy variables are used for 20 or under (YOUNG), over 30 but 45 or under (MIDDLE), and over 45 (OLD).
SCHOOLING	Years of schooling as of 1978.
DEPENDENTS	Number of dependents in 1978.
OTHER FAMILY WORKERS	Number of other family members contributing to family income in 1978.
SINGLE	Dummy variable if single during that year [or % of years single from 1974-78 for the % TOTAL regression].
LANDOWNER	Dummy variable if landowner, but not ejidatario.
EJIDO	Dummy variable if ejidatario.
POVERTY	The percent of the economically active population in the state reporting a monthly income of less than 300 pesos in the 1970 census.
TRANSPORT	Average amount paid in 1978 (100 pesos) in transportation costs by migrants going to the U.S. from that state of origin.
BORDER	Dummy variable for those living in the Mexican border area.
INTENSITY	Weighted number of ENEFNEU return migrants by state, divided by the state economically active population in 1970 (in thousands).
BRACERO	Weighted percent of ENEFNEU return migrants who began migrating during the Bracero period, computed for each state of origin.
APPREHEND	Percentage of weighted ENEFNEU return migrant <u>trips</u> to the U.S. during 1974-78 resulting in apprehension, computed for each state of origin.



Owning land privately (LANDOWNER) or being an ejidatario (EJIDO) are also included as independent variables. Either type of landownership is representative of wealth which is likely to reduce the need for temporary migration. However, incomes from farming are known to be highly volatile, and in particular conditions in agricultural Mexico appear to have been degenerating during the 1976-76 period. Also, the need for working capital is generally higher for farmers than nonfarmers. These latter two aspects both act to increase the propensity for temporary migration. In addition, ejidatarios are subject to certain legal restrictions. For example, if they do not cultivate the land within a two-year period, they officially lose rights to the land.

Two basic variables were used to represent general structural characteristics of the state of origin. POVERTY is the percentage of the economically active population reporting a monthly income of less than 300 pesos per month in the 1970 census. We allow for variations in the coefficient through a linear spline with three segments: POVERTY less than 18 (POVERTY SPLINE 1), POVERTY between 18 and 33 (POVERTY SPLINE 2), and POVERTY greater than 33 (POVERTY SPLINE 3). The boundaries were chosen by ranking the states represented in the sample and dividing them into three equal-sized groups.

The second variable used in the state-level category is TRANSPORT, the average amount paid in 1978 (100 pesos) in transportation costs by migrants going to the U.S. from that state of origin. This gives a measure that increases with distance, but more accurately represents the difficulty of getting to the U.S. In addition, BORDER was included as a dummy variable for those living in the Mexican border area. Since distance from the U.S. border and per capita income levels of states tend to be quite negatively correlated, it is difficult to separate out these two effects. Thus, in making predictions, we consider only joint comparative static changes in TRANSPORT, POVERTY, and BORDER.

The last category of variables used as independent variables are those representing the historical migration process itself. The three variables used are all computed from the weighted return migrant ENEFNEU sample. First, INTENSITY is defined (as previously) as the number of return migrants who had been to the U.S. at least once during 1974-78 working or looking for work, divided by the state economically active population in 1970 (in thousands). A

three-piece linear spline is also used here, with division points at 23 and 67. Second, BRACERO, as described above, represents the extent to which the 1974-78 temporary migrants from that state began going during the Bracero period. Again a linear spline is used, with divisions at 3 and 18. Because the first group is composed almost entirely of states where BRACERO is equal to zero, the coefficient for BRACERO SPLINE 1 is constrained to be equal to 0. Last, a measure of the expected probability of apprehension is derived from the percentage of total (weighted) trips during the 1974-78 period to the U.S. from that state that resulted in apprehension (APPREHEND).

From the earlier discussion of the maturation of migration networks, we might anticipate results along the following lines: controlling for nonnetworking variables, those with very young migration networks (INTENSITY and BRACERO small, and APPREHEND large) are on average likely to have small propensities to migrate. Trips are short and infrequent. As the network matures, the probability of migrating is generally thought to increase and cover a broader range of the population. At the extreme, however, with very mature migration networks, we also see a move towards permanency, and our individual measures of the intensity of out-migration may begin to fall. Thus, those in the return migrant data are more likely to be those with below average propensities to migrate. That is, those included in the sample have unobserved individual characteristics that imply an above average tendency to stay in Mexico (i.e., life-style preferences, bad luck in the U.S., particular skills, etc.). Some of those with above average tendencies to migrate have left permanently, or at least did not return for the holidays in December 1978, and thus are not included in the return migrant sample. This role of the maturation of networks is evident in comparisons made from the ENEFNEU National Survey. For return migrants, 29.8 percent came from the south central region, while 38.8 percent of the migrants "still away" were reported from this area. For the north (excluding the border area), 21.9 percent of the return migrants and only 16.0 percent of the migrants still away were reported (CENIET, 1982: p. 14). This is suggestive of a lengthening time away and perhaps a move towards permanency for more mature networks, both indications of a greater exclusion of these migrant types from our sample.

#### B. Methodology and Empirical Results

Two types of logit regressions were used in the analysis. For % TOTAL, the dependent variable is simply transformed into the logit form, setting values of 1 equal to .99 where present. Since a maximum likelihood logit

procedure was not available at CENIET at the time of the analysis, an alternative least squares approach was used for the year-by-year regressions with binary-dependent variables (THERE78, etc). Using discriminant function estimates which can be obtained from ordinary least squares, coefficients are transformed to compute estimates of the logistic model coefficients (Haggstrom, 1974). These estimates are consistent under the assumption that the independent variables are multivariate normal, and are likely to be good approximations in the nonnormal case. Other studies have found parameter estimates and standard errors to be quite close to the maximum likelihood estimates (Halperin et al., (1971). Since both permanent migrants and nonmigrants are excluded from our sample, sample selectivity bias may be present in the estimates. Formally, we must assume that the expectation of the error term, conditional on being a return migrant, is zero.

The estimated transformed coefficients and t-statistics are shown in Table V. First we summarize the basic results focusing on the significance of the three categories of independent variables. Secondly, we predict the propensities to migrate from these estimated models in a variety of circumstances. In this way a sense of the numerical importance of the independent variables and the changes over time can be more easily ascertained.

Of the individual level variables, the age of the respondent and whether or not he was an ejidatario, provide the most explanatory power. The propensity to migrate generally increases with age, but is decreased if ejido land is owned. Being single or having dependents or other family workers generally contribute little, although these variables tend to be correlated. Also, years of schooling stands out as being very insignificant in all years examined.

All of the state-level structural variables are important. Living in the border region has, not surprisingly, a positive and very significant impact on migration in all years. Transportation costs have an interesting trend, changing from positive and significant in 1974 to negative and significant in 1978. This suggests a shift in out-migration patterns from the traditional (and further away) Central Plateau to more northern states. POVERTY also is significant at the 5 or 10 percent levels in almost all cases. The linear

TABLE V  
ESTIMATED REGRESSION COEFFICIENTS\*

	THERE 74	T- STAT	THERE 75	T- STAT	THERE 76	T- STAT	THERE 77	T- STAT	THERE 78	T- STAT	% TOTAL	T- STAT
AGE	.0493	2.49	.0353	1.77	.0438	2.30	.0093	.50	-.0217	-1.16	.0286	1.68
YOUNG	-1.0619	-3.58	-.8521	-2.82	-.3832	-1.33	-.2631	-.93	.3578	1.26	-.6080	-2.36
MIDDLE	-.2930	-.93	.3422	1.08	-.3959	-1.32	-.0206	-.07	.1756	.59	.0018	.01
OLD	-.0920	-.16	.6376	1.07	-.1906	-.33	.0334	.06	.9403	1.68	.5695	1.12
DEPENDENTS	-.0135	-.40	-.0540	-1.58	.0075	.23	-.0284	-.89	.0050	.16	-.0196	-.67
OTHER FAMILY WORKERS	-.0350	-.54	-.1708	-2.58	-.0584	-.92	.0922	1.47	.0525	.83	-.0242	-.43
SINGLE	.1049	.49	.4305	1.98	.2630	1.25	-.1848	-.89	.1747	.83	.0280	1.34
SCHOOLING	.0029	.11	.0049	.19	-.0046	-.19	-.0122	.52	.0099	.42	.0082	.38
LANDOWNER	-.1222	-.33	.7445	1.98	.1468	.41	-.1171	-.33	-.3427	-.97	-.0415	-.13
EJIDO	.1040	.23	-.9149	-1.99	-.5804	-1.32	-.8874	-2.07	-.5024	-1.16	-.7501	-1.92
BORDER	.5997	2.02	1.1679	3.88	.8791	3.07	1.6975	6.05	.7543	2.67	1.5455	6.04
TRANSPORT	.0411	1.96	.0689	2.81	.0599	2.56	-.0159	-.70	-.0410	-1.78	.0014	.69
POVERTY SPLINE 1	-.0154	-.43	-.0517	-1.42	-.0987	-2.86	-.0368	-1.09	-.0725	-2.13	-.1048	-3.40
POVERTY SPLINE 2	-.0780	-2.32	-.0903	-2.66	-.1097	-3.40	-.0150	-.47	-.0161	-.51	-.0943	-3.27
POVERTY SPLINE 3	.0414	1.16	.0715	1.99	.1017	2.97	.0746	2.23	.0660	1.96	.1126	3.68
BRACERO SPLINE 2	.0301	.65	.0816	1.73	.2036	4.53	.1449	3.29	.1079	2.44	.1815	4.53
BRACERO SPLINE 3	-.0271	-.89	-.0350	-1.14	-.0845	-2.90	-.0712	-2.49	-.0553	-1.93	-.0836	-3.21
INTENSITY SPLINE 1	.0254	.76	.0328	.97	-.0163	-.51	-.0932	-2.95	-.0467	-1.47	-.0316	-1.10
INTENSITY SPLINE 2	.0001	.01	.0043	.49	-.0141	-1.71	-.0010	-.12	.0097	1.19	-.0006	-.08
INTENSITY SPLINE 3	.0022	1.27	-.0010	-.56	-.0017	-.99	-.0043	-2.65	-.0035	-2.12	-.0027	-1.80
APPREHEND	-.0215	-1.67	.0016	.13	.0184	1.48	.0332	2.73	.0489	4.01	-.0287	2.60
CONSTANT	-2.1829	-.34	-2.8953	-.34	-2.0040	-.37	-.1470	-2.37	.3683	2.99	-1.2010	-1.47

NOTE: \*Coefficients for regressions of THERE78 through THERE74 have been transformed into the logit form, as indicated in the text.

spline function suggests that the propensity to migrate diminishes as the percent below the poverty level increases from 0 to 33, but then responds positively. That is, all other things held constant, the individual propensity to migrate temporarily is highest in the poorest and richest states, but lower for those states with in-between degrees of poverty.

Last we move to variables related to historical migration patterns. BRACERO is quite significant, particularly in more recent years. The coefficients imply, as predicted, that individuals from states with the lowest and highest values of BRACERO have the lowest individual propensity to migrate temporarily. States with the highest levels of BRACERO have either sent out mostly permanent migrants — or perhaps individuals have reinvested in their home communities, leaving them less of an incentive to migrate. The coefficients for INTENSITY are more significant in later years, and suggest that individuals from states with the highest INTENSITY (of people who have gone at least once during the period) have a lower individual intensity of temporary migration. Again this is consistent with the idea that new migration networks are forming. The coefficient for the probability of apprehension shows a similar, though perhaps more striking trend. It moves from a negative and significant level in 1974 to a positive and significant level in 1978. Assuming that the probability of apprehension is a good measure of the maturity of migration networks, again we might conclude that new communities are beginning to send migrants.

Coefficient estimates from the above estimation can be used to make predictions about the migration behavior of individuals with certain characteristics, over the life cycle, and over various regimes of state-level characteristics. Predicted values are shown in Tables VI and VII, along with sample average for dependent variables. Due to software limitations, standard errors for the predictions were not computer.

A "typical migrant" is used for a standard model. In the standard model, sample averages for independent variables are used, except for the dummy variables. Thus our typical (male) migrant is 33 years old, has 4 dependents and 1.3 family workers, and has had 5 years of schooling. It is assumed that he is married, does not own private or ejido land, and does not live in the border region. The average state from which he comes has 26 percent of the working population under the poverty level, and has sent 10.3 percent of its labor force to the U.S. at some time during 1974-78. About 18 percent of these temporary migrants began migrating during the Bracero period, and the

average apprehension rate per trip is 23 percent. The typical migrant pays 500 pesos (1978) in transportation costs to the United States. The standard model predicts that he has spent some time in the U.S. for 2 years out of the five-year sample period. It should be noted that since there was intentional oversampling in some areas, these sample averages are not averages for a representative migrant from the appropriately weighted ENEFNEU return migrant survey.

Table VI shows predictions for variations in the individual characteristics associated with migration. Looking down the column of predictions for % TOTAL, our measure of the overall individual intensity of migration, certain characteristics are evident as having a large numerical impact on the individual intensity of temporary out-migration. Single people and older people migrate more, giving a life cycle pattern of migration that decreases through the 20's but begins increasing again in the 30's. Also, being an ejidatario results in a much lower propensity to migrate (.23 compared with .39 in the standard model), suggesting that the legal constraints on land play an important role. Other individual characteristics are numerically as well as statistically unimportant. Having more dependents, other family workers, or schooling appears to make little difference to the overall propensity to migrate, as does owning a private plot of land.

Trends over time reveal some interesting patterns. In particular we are interested in seeing what characteristics induced the largest increase in the propensities to migrate over the five-year period. It can first be observed that our typical migrant has a fairly constant propensity to migrate in 1974-76, but there is a large increase following the 1976 devaluation with a further increase in 1978. This pattern is much more evident in the standard model than in the sample averages, suggesting that married nonfarmers living outside of the border region were particularly responsive to the devaluation. That is, most migrant types increased the propensity to migrate between 1976 and 1977, but the variation in the response reflects our prior expectations.

Focusing first on individual and family characteristics, we find that those migrants with other family workers were much more able to take advantage of the direct benefits induced by the devaluation. This might be viewed as a confirmation of the household model of migration, but readers should note that the standard errors on these predictions could be large. It is also interesting to note that ejidatarios, largely maize producers in the Central

TABLE VI

PREDICTED VALUES FROM REGRESSION ESTIMATES:  
 PREDICTED PROPENSITY TO MIGRATE

Characteristic	There74	There75	There76	There77	There78	% Total
Sample Averages	.38	.40	.46	.52	.61	.47
Standard Model*	.27	.28	.28	.45	.57	.39
<u>Individual Characteristics</u>						
Single, No Dependents	.30	.43	.33	.44	.61	.92
Dependents = 0	.30	.33	.27	.48	.57	.41
Dependents = 6	.26	.26	.28	.44	.58	.39
Other Workers = 0	.28	.33	.29	.42	.56	.40
Other Workers = 3	.26	.23	.26	.49	.60	.38
Years of Schooling = 0	.25	.45	.31	.43	.49	.39
Years of Schooling = 12	.27	.29	.27	.43	.59	.41
Landowner	.25	.45	.31	.43	.49	.38
Ejidatario	.26	.25	.20	.23	.37	.23
<u>Life Cycle Scenario</u>						
Age = 19, Single, Dependents = 0, Other Workers = 1.3	.09	.11	.20	.36	.73	.81
Age = 23, Married 2 Years Dependents = 1, Other Workers = 0	.20	.20	.14	.43	.56	.62
Age = 33, Married, Dependents = 4, Other Workers = 0	.28	.33	.29	.42	.56	.40
Age = 43, Married, Dependents = 5, Other Workers = 1	.37	.36	.38	.46	.52	.46
Age = 53, Married, Dependents = 2, Other Workers = 2	.55	.51	.52	.54	.66	.67

NOTE: \*For the standard model, AGE = 33, DEPENDENTS = 4, OTHER FAMILY WORKERS = 1.3, SCHOOLING = 5, BORDER = 0, TRANSPORT = 5, POVERTY = 26, INTENSITY = 103, BRACERO = 18, and APPREHEND = 23.

Plateau, do not show a significant increase in migration until 1978 — exactly when the real price of maize finally showed a considerable drop.

Table VII shows the predictions associated with state structural variables. The five combinations of the state-level variables POVERTY and TRANSPORT reflect real regional differences within Mexico, since POVERTY tends to increase with distance from the U.S. border. These state-level characteristics are generally very important in magnitude. Decreasing POVERTY by one standard deviation and setting transportation costs to zero, our typical migrant living in the border area has a predicted propensity of 0.92, i.e., he would spend at least some time in the U.S. for 4.5 out of the 5 years. A migrant in the same state, for example, but living outside of the border area with transportation costs of 100 pesos also has a high intensity of migration of .70. As POVERTY and transportation costs increase to the levels of those assigned in the standard model, migration continues to fall to .39. But with further increases in POVERTY and transportation costs, migration begins to rise again.

The predicted patterns for state-level historical characteristics, also in Table VII, follow the state-level structural characteristics' pattern. Those with the least and most mature migration networks have the lowest intensity of out-migration, where maturity of the network is measured by BRACERO, INTENSITY, and APPREHEND. One standard deviation of variation of these variables gives predictions of .24 for immature networks and .17 for mature networks, compared with .39 in the standard model.

Differences in trends according to state characteristics are particularly interesting. Again we find that migrants are predicted to take actions which are consistent with the severity and regional influence of the economic crisis in Mexico during that period. First we look at the structural characteristics. For all the combinations of POVERTY and transportation costs examined, there has been an increase in the propensity to migrate of about 33 percentage points in comparing 1978 with 1974. The variations in the timing of the response are consistent with the changes in the Mexican economy during this period. Commuters from the border region show large increases in migration from 1974 to 1975, when the recession became severe. There was a major response to the devaluation, but by 1978 this had tapered off. Relatively rich states not far from the border also show large increases in migration prior to the devaluation, but little immediate response to the devaluation itself. This corresponds to the notion that devaluation



TABLE VII

PREDICTED VALUES FROM REGRESSION ESTIMATES:  
STATE-LEVEL CHARACTERISTICS

Characteristic	There74	There75	There76	There77	There78	% Total
<u>State-Level Structural Characteristics</u>						
Poverty = 13 Transportation Costs = 0 Border Region	.52	.70	.73	.87	.85	.92
Poverty = 13 Transportation Costs = 1	.39	.44	.54	.55	.72	.70
Poverty = 26 Transportation Costs = 5	.27	.28	.28	.45	.57	.39
Poverty = 39 Transportation Costs = 10	.25	.31	.31	.52	.59	.40
Poverty = 43 Transportation Costs = 800	.27	.34	.37	.60	.67	.51
<u>State-Level Historical Characteristics</u>						
Bracero = 11 Apprehension Rate = 36 Intensity = 22	.17	.16	.19	.38	.48	.24
Bracero = 18 Apprehension Rate = 23 Intensity = 103	.27	.28	.28	.45	.57	.39
Bracero = 25 Apprehension Rate = 10 Intensity = 184	.32	.22	.13	.19	.27	.17

significantly improved (at least initially) the price incentives for the northern agricultural exporting states. As we move to poorer states, further away from the U.S. border, the direct response to the devaluation is largest, suggesting that the economic incentives accompanying the devaluation were most clear-cut and most heeded by individuals from these areas.

Finally, the variables related to state-level historical migration characteristics show important trends. These states with the most mature networks showed the highest propensity to migrate in 1974, but the lowest in 1978. For these states there is a general downward trend from 1974 to 1976, presumably as people "retire" from temporary migration (either in Mexico or the U.S.), but an increase again in 1977 and 1978 as the economic incentives for migration become more favorable.

The less mature networks show relatively constant probabilities of migration from 1974 to 1976, but large increases from 1976 to 1978. By 1978 those from less mature networks have almost doubled the probability of migrating than those from the mature networks. It appears that the 1976 devaluation and surrounding economic events, while generally increasing the incentive to migrate, had the particular impact of inducing the development of new migration networks. One question that remains, though, is whether these new networks will follow the old patterns.

## VI. CONCLUSIONS

The ENEFNEU data set in Mexico provides new evidence on the sources and trends in temporary out-migration during the 1974-78 period. In this paper we have examined the evidence on both the state and individual levels, and have related it to the current understanding of historical migration patterns. Although the return migrant portion of the data set used in the analysis here does not capture all stages of migration networks, we are able to form some hypotheses from the evidence:

- 1) Migration patterns during the Bracero period are important in explaining current patterns of temporary out-migration. Simple observations from state-level data suggest that those with the most migratory experience during the Bracero period had the highest intensities of temporary out-migration during the mid-1970's. This evidence is investigated further on the microeconomic level, where we control for

basic individual characteristics, average transportation costs, and the poverty level of the state of origin. Using state-level measures of activity during the Bracero period, overall participation in temporary out-migration to the U.S., and the average apprehension rate as indicators of the maturity of networks, we find the individual intensity of temporary out-migration is lowest for those from states with the most and the least mature networks. It is likely that in general those from states with very mature networks have moved to stages of longer-term migration.

2) There are a number of indications that new migration networks were forming during the mid-1970's. First, we find that the average rate of growth of the intensity of temporary out-migration from 1974-78 is highest for states in the sample from nontraditional sending regions. This is again supported by the microeconomic evidence. Controlling for nonnetworking variables, we find that those from states with the most mature networks showed the highest propensity to migrate in 1974, but the lowest in 1978. In particular, those individuals from states with the least mature networks showed sudden and impressive increases in the probability of migrating following the 1976 devaluation.

3) Family-level characteristics, as specified, show surprisingly little impact on the propensity to migrate. Two explanations seem most likely. First, the sample selection criteria may be important. That is, for those who have migrated at least once in the past five years, but were in Mexico in December 1978, family-level characteristics have little impact on decisions to increase the intensity of that migration. Second, it has been pointed out that even within our sample these variables have conflicting roles; often having a family both increases the desire to stay in Mexico (not migrating at all that year), but also increases the need for cash that is earned more easily in the U.S. The net effect may be close to zero.

4) The direct impact of the devaluation on the probability of migrating, at least in 1976-77, was largest for those in poorer states further away from the border region. There is also some indication that married people that were not ejidatarios had larger responses. This suggests that those most in need of income responded most quickly to the direct increase in the financial gains to migration caused by the devaluation.

The nature of this study is clearly exploratory — statistical techniques, choice of functional forms, and the choice of indicators might all benefit

from further analysis. However, this new data seem to provide important new evidence, in general on temporary migration to the U.S., and in particular on the nature of migration networking. The directions for future research are numerous. Further case studies, particularly those with a time-series aspect to them, can contribute much in understanding the details of networking. The move from temporary to permanent migration is a particularly elusive topic. And last, linking this information back to the general picture of temporary migration to the U.S. is critical.

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