DISTANT FIELDS: MEXICAN FARMWORKERS AND NEW IMMIGRANT DESTINATIONS IN THE UNITED STATES

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by
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ABSTRACT

The demand for low-wage agricultural workers has been vital to the history of Mexican migration to the United States and continues to be an important factor in contemporary immigration processes. Mexican-born farmworkers, similar to immigrants in other industries, are increasingly bypassing traditional gateway cities and states and settling in new destinations. This research focuses on changes in the geographic distribution of Mexican-born farmworkers over time, earnings inequalities among Mexican-born farmworkers living in traditional agricultural settlement states (California and Texas) and those living in new agricultural destination states, and the structural changes in the agriculture industry that are increasing the demand for hired farm workers. Findings suggest that there has been a dramatic shift in the geographic distribution of this population since 1980, as the proportion of Mexican-born farmworkers living outside of traditional settlement areas has increased. Also, in the 1980s, Mexican-born farmworkers living in traditional settlement states had higher earnings than those residing elsewhere, but that since 1990 earnings have been greater for farmworkers living in new destination states. Through decomposition analysis, this reversal of earnings inequalities is found to be more attributable to changes in the structure of earnings less to changes in the population composition. Variation in the relationship between agricultural restructuring and the demand for hired labor across traditional settlement states and new destination states helps explain these patterns.
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Chapter 1

Introduction

The demand for farm labor has been vital to the history of Mexican immigration to the United States and continues to be an important factor in the contemporary migration processes of a large subset of immigrants. Beginning in the early 1900s, workers from Mexico were actively recruited by employers, labor contractors, and the U.S. government to fill labor shortages in agriculture (Reisler 1976). From 1942-64, nearly 4.5 million Mexican laborers migrated to the U.S. as part of the Bracero Program which was initially created to prevent farm labor shortages during World War II (Massey and Liang 1989; Mitchell 1996). Even the restrictive Immigration Control and Reform Act (IRCA) of 1986 made special provisions for agricultural workers which resulted in an additional 1.2 million undocumented immigrants receiving amnesty because of their status as farm laborers (Boucher, Smith, Taylor, and Yunez-Naude 2007). There has clearly been a strong connection between agricultural labor and Mexican migration; however, research situating farmworkers within broader patterns of contemporary Mexican migration is lacking.

The Hispanic population in the United States has experienced unprecedented growth in recent decades making it now the nation’s largest racial/ethnic minority group. While fertility rates for this population tend to be above the national average (Bean, Swicegood, and Berg 2000; Bean, Tienda, and National Committee for Research on the 1980 Census. 1987), the majority of this growth has come through migration to the United States from Mexico and other Latin American countries. Mexico, which has long
been the largest immigrant-sending country to the United States, is the country of origin or ancestry of nearly 65 percent of U.S. Hispanics (Bureau 2008). In addition to the overall growth of the Mexican-born population, there has been considerable geographic dispersion of this population to new destinations throughout the United States. Historically, Mexican immigrants were concentrated in relatively few large cities in California, Illinois, and throughout the Southwest. Today, many Mexican-born immigrants are either leaving these traditional gateway cities, or bypassing them altogether, and settling in new destinations making Mexican immigration a national phenomenon (Durand, Massey, and Charvet 2000).

Explanations for the recent growth of Mexican immigrant populations in new destinations focus on changes in immigration policy, the saturation of labor and housing markets in traditional settlement areas, and economic restructuring in new destinations. The Immigration Reform and Control Act of 1986 (IRCA) provided amnesty for millions of undocumented immigrants which allowed them to move more freely within the United States (Massey, Durand, and Malone 2002). This change in immigration policy also ramped up law enforcement along the Mexico/United States border, which forced undocumented migrants to use new and often more dangerous points of entry. In addition to creating new points of entry along the border, the expansion of the U.S. Border Patrol increased the costs of migration, which in effect, put an end to circular migration flows between the United States and Mexico (Massey, Durand, and Malone 2002). Ironically, IRCA has increased the total number of Mexican immigrants in the United States and created the conditions whereby they are moving to new destinations.
Network saturation theory also helps to explain the growth of Mexican immigrants in new destinations. This theory draws on cumulative causation theory which states that migration flows become cumulative or self-perpetuating over time because of social networks and can therefore continue after the mechanisms that originally started the flow have ended (Massey 1990). Light (2006) argues that the number of immigrants in Los Angeles, a gateway city for Mexican immigrants, became too large for these immigrants to find affordable housing or jobs, forcing them to settle in new destinations. An empirical test of this theory confirms that high rents and low wages in California, Texas, and Illinois (the three main destination states for Mexican immigrants) deflected immigrants to other states (Light and von Scheven 2008).

Economic restructuring in new destinations also helps to explain shifts in the demand for immigrant labor and the consequent growth of Mexican immigrants in those areas (Crowley, Lichter, and Qian 2006). For example, the economic restructuring of the meat processing industry in the Midwest has created a demand for low-skilled workers that has been largely filled by Mexican immigrants (Kandel and Parrado 2005). Similarly, economic restructuring in manufacturing in the rural south has attracted Mexican immigrants to that region as well (Hernández-León and Zúñiga 2000). These and other examples of economic restructuring attracting immigrants to new destinations all tell a very similar story: following restructuring of a particular industry, occupations that were once dominated by native-born workers become low-wage jobs which are filled by immigrant workers. In this way, occupation and industries that were once dominated by native-born workers are becoming immigrant-dominated industries in some local areas.
One type of economic restructuring that has not been addressed in this literature is the restructuring of the agricultural sector. Since World War II, there have been dramatic changes in the structure of agriculture in the United States (Lobao and Meyer 2001). The declining number of farms, increasing average farm sizes, proliferation of large-scale livestock production, substitution of hired farm labor for family labor, and the overall industrialization of food and fiber production characterize the process of agricultural restructuring (Buttel and LaRamee 1991; Cross 2006; Friedland 1991; Jackson-Smith 1999; Lyson and Welsh 2005). While there are regional differences in the structure of agriculture throughout the United States, there is evidence of restructuring in nearly every type of commodity and form of production. Agricultural restructuring might be attracting Mexican-born immigrants to new destinations given their long history of working in agriculture.

**Industrial Distribution of Mexican Immigrants**

In the U.S. labor market, it is often immigrant workers who do the most dangerous, dirty, and low-wage jobs (Waldinger and Lichter 2003). Sociologists refer to the concentration of racial or ethnic groups into a particular type of employment as occupational or industrial segregation. Some more common examples of the occupational segregation of immigrants into particular industries include domestic workers in Southern California who are mainly young females from Mexico and Central America (Hondagneu-Sotelo 2001; Milkman, Reese, and Roth 1998), workers in the garment industry in New York and Los Angeles (Chin 2005; Light, Bernard, and Kim 1999), and of course, Mexican-born farmworkers in some parts of the United States (Martin 2002).
Historically, more Mexican-born immigrants have worked in agriculture than any other industry. Figure 1.1 uses data from the 1% Public Use Microdata Samples (PUMS) of the 1930-2000 Decennial Censuses and data from the 2005-2007 American Community Survey (ACS) to illustrate the relative distribution of Mexican-born immigrants across select industries. These particular industries—agriculture, construction, restaurants, and personal services—all have high concentrations of immigrant workers. In 1930, roughly 18 percent of all migrants from Mexico worked in agriculture while less than 5 percent worked in restaurants, construction, or personal services. The percentage of Mexican-born immigrants working in agriculture increased dramatically with the establishment of the Bracero Program, which lasted from 1942-1964. During that time, the share of Mexican-born immigrants working in agriculture peaked at nearly 30 percent in 1960 while the percentage working in restaurants,
construction and personal services remained relatively low. However, since that time there has been a precipitous decline in the percentage of Mexican-born immigrants working in agriculture as employment opportunities in other industries have increased. From 1930-1990 there were more Mexican-born immigrants employed in agriculture than in any other single industry.

This decline in the industrial concentration of Mexican-born immigrants working in agriculture corresponds with the beginning of one of the most substantial waves of immigration to the United States. The post-1965 era of immigration has been remarkable not only in its magnitude but also its diversity (Portes and Rumbaut 1996). The foreign-born population in the United States increased from 9.6 million in 1970 to 28.4 million in 2000 (Bureau 2001). In addition, migration streams were established from countries-of-origin that did not have a history of immigration to the United States (Massey 1981).

The magnitude of this increase is reflected in the absolute industrial distribution of Mexican-born immigrants (Figure 1.2). From 1930-1980, more Mexican-born immigrants worked in agriculture than any other single industry. By 1980, the number of immigrants working in the agriculture, construction, and restaurant industries was roughly the same. Over the next decade, however, there would be a dramatic increase in the number of Mexican-born immigrants working in construction and restaurants to the point that by 2007, nearly twice as many worked in restaurants and three times as many in construction than in agriculture. It is important to point out that despite the relative decline in the number of Mexican-born immigrants working in agriculture, there are more Mexican-born farmworkers today than at any point in the 20th Century.
Historically, Mexican-born farmworkers have also been geographically concentrated in a few select states. Immigrant farm labor is most prevalent in the fresh fruits and vegetables (FFV) sector which is regionally clustered in California, Texas, Arizona, and Florida (Martin, Fix, and Taylor 2006; Pfeffer 1983). The geographic concentration of Mexican-born farmworkers in California and the Southwest has its root in the geography, politics, and social structure of that region. In his history of immigrant labor in California, Mitchell (1996) argues that the unique geography of California led to the development of a large, industrial farming system that necessitated large numbers of temporary workers. The political influence of powerful Farm Associations in California and Texas helped to continue the Bracero Program long after World War II (Massey,
Durand, and Malone 2002). Pfeffer (1983) contends that this system of farming was only able to develop in California because of the access to cheap, immigrant labor from Mexico.

While Mexican-born farmworkers have been historically located in California and the Southwest, recent changes in the structure of agriculture are creating demand for low-wage farm laborers in other regions of the United States. For instance, restructuring in the dairy industry has forced many farmers to increase the size of their operation and hire additional workers. Consequently, there has been a sizable increase in the number of Mexican-born workers in dairies in New York State (Maloney 2002) and Wisconsin (Harrison, Lloyd, and O'Kane 2009). There also has been a dramatic increase in the number of Mexican-born farmworkers in Washington State as the apple industry has transitioned to a global supplier of fresh fruit (Jarosz and Qazi 2000). Restructuring in the tobacco industry in North Carolina has made it a destination state for migrant farmworkers (Balderrama and Molina 2009; Griffith 2006). Agricultural restructuring is creating employment opportunities for Mexican-born immigrants in new agricultural destinations.

**Objectives and Outline**

The purpose of this research is to measure the extent to which Mexican-born immigrants in new destinations are working in agriculture, the farm structure characteristics that are creating demand for this labor, and the economic well-being of farmworkers in new destinations. This analysis is guided by the following research questions:
1. **Over time, how has the geographic distribution of Mexican-born farmworkers in the United States changed?**

2. **What differences are there in the demographic and socioeconomic composition of Mexican-born farmworkers living in traditional settlement states (California and Texas) and those in new destination states?**

3. **Do the earnings of Mexican-born farmworkers differ between new destination and traditional settlement areas?**

4. **How have differences in earnings by these destination types changed over time?**

5. **How is the demand for hired farm labor different in traditional settlement states (California and Texas) from the demand for hired farm labor in new destination states (Other States)?**

6. **How does agricultural restructuring affect the demand for hired farm labor?**

7. **What differences are there by destination type in how agricultural restructuring is related to the demand for hired farm labor?**

This thesis is organized into the following chapters. Chapter 2, entitled “Literature Review” reviews the relevant theoretical and empirical literatures related to international migration, spatial and economic assimilation, new destination migration, agricultural restructuring, and the socioeconomic characteristics of Mexican-born farmworkers.

Chapter 3, entitled “Data and Methods” provides a detailed description of the data and methodological approaches used in this research.

Chapter 4, entitled “The Changing Spatial Distribution of Mexican-born Farmworkers in the United States” presents a descriptive analysis of the shifting geography of farmworkers using individual-level IPUMS data. This chapter also provides a descriptive analysis of the demographic composition, social, and poverty characteristics
of Mexican-born farmworkers in traditional settlement states (California and Texas) and new agricultural destinations.

Chapter 5, entitled “The Changing Earnings Inequalities of Mexican-born Farmworkers” is an analysis of differences in earnings by destination type. Specifically, I used individual-level data from IPUMS to model the log hourly wages of farmworkers in traditional settlement states and new agricultural destinations. This analysis also uses regression decomposition techniques to identify and assess the different components of change in the wages of Mexican-born farmworkers. Chapter 6, entitled “Agricultural Restructuring and the Demand for Hired Farm Labor” focuses on the relationship between county-level changes in the structure of agriculture and the demand for total hired labor, seasonal labor, and migrant labor. This analysis uses data from the Census of Agriculture. The final chapter summarizes the key finding from the research and discusses their implications for future research and public policy.
Chapter 2

Literature Review

This chapter reviews and synthesizes several theoretical and empirical literatures to develop the context for the present study of Mexican-born farmworkers in the United States. The first section develops a theoretical framework for analyzing the movement of Mexican immigrants to new destinations and their potential integration into those communities. The second part of this chapter reviews the emerging literature on new immigrant destinations in the United States and offers agricultural restructuring as an additional explanation for this phenomenon. The next section focuses on the historical and empirical literatures related to immigrant farmworkers in the U.S., focusing on their geographic distribution, socioeconomic characteristics, and their economic and occupational mobility. Finally, research questions and hypotheses are outlined.

Theoretical Foundations

This study draws on several different theoretical perspectives to explain the growth and economic assimilation of Mexican-born farmworkers in new destinations throughout the United States. First I summarize theories of migration highlighting how these theories operate for both between country and within country moves. Next, I review theories of spatial and socioeconomic assimilation. Finally, I synthesize two prominent international migration and assimilation theories—cumulative causation and segmented assimilation—to provide a more comprehensive explanation for the relationship between
the spatial and economic assimilation of Mexican-born immigrants working in agriculture.

**International Migration Theory**

Migration theories explain why people move. The earliest theory of migration, push/pull theory, focused on the conditions at origin (push) and destination (pull) that motivated people to migrate (1966). This framework has since been expanded to include specific economic, social, and political mechanisms that either push or pull migrants (Massey 1990; Stark and Bloom 1985; Todaro 1969; Zolberg 1989). The theoretical perspectives outlined below are divided into economic and social theories of migration.

**Economic Theories**

Economic theories of migration are most concerned with the supply and demand of labor and wage differentials between geographic regions (Harris and Todaro 1970; Todaro 1969). In his earliest formulation of a macroeconomic theory of migration, Todaro (1969) argued that international migration is caused by geographic differences in the supply and demand of labor and that low wage-rates in labor-abundant countries encourages migration to countries with labor shortages (and in theory, higher wages). The concept of wage differentials between geographic regions was later expanded into a theory of microeconomic migration which used the rational actor paradigm to explain international migration (Todaro and Maruszko 1987). This theory held that individuals use cost-benefit analysis to determine if the perceived returns to migrating (usually
increased income) outnumber the perceived potential earnings at origin and the costs of migrating.

The “new home economics” of migration is an alternative to the neo-classical explanations of international migration (Stark and Bloom 1985). While this theory also stresses that international migration is largely driven by economic motivations, it expands from the autonomous actor paradigm employed in the microeconomic approach to the household as the economic decision maker. Households act collectively to maximize economic return and minimize economic risk. The migration of some members of the household helps to diversify risk. By using a risk approach, Stark and Bloom (1985) are able to explain why migration occurs even without significant wage differentials between the origin and destination as long as having some members migrating economically benefits the household.

While these theories help explain the motivations and strategies of the individuals and households which make up the supply of international migrants, they do not address the economic factors creating demand for immigrant labor in industrial economies. This demand can however be explained using Segmented Labor Market theory (Piore 1979). Segmented Labor Market theorists argue that workers in the U.S. economy are divided into primary and secondary labor markets (Edwards, Reich, and Gordon 1975; Gordon, Edwards, and Reich 1982). The primary labor market is made up of high-skilled, well remunerated, high prestige, and secure jobs while the secondary labor market is comprised of low-skilled, poor paying, unstable, and dangerous jobs with low pay and poor benefits. Because jobs in the secondary sector are unattractive to native-born
workers, they are often filled by immigrant workers who have limited opportunities for employment in the primary sector (Piore 1979).

In the most advanced stage of capitalism—global capitalism—jobs in the primary sector that were formerly protected are made vulnerable through global restructuring (Sassen-Koob 1985). The global economy is an economy that has the technological, institutional, and organizational capacity to coordinate production in real time and on planetary scale (Castells 1996). Both a cause and a consequence of global restructuring, the transformation of industrial economies from a manufacturing to a service base erodes the stability of primary sector jobs. Consequently, some occupations that were once in the primary sector and employed few immigrants are now secondary sector jobs that are dominated by foreign-born workers. For example, as the meat processing industry in the United States has become deunionized and consequently deskillled, the once native-born workforce has been replaced by foreign-born workers (Kandel and Parrado 2005).

Another condition of global restructuring is that the coordination of production associated with the global economy relies not only on the mobilization of capital but also on the international flow of labor. International migration is hardly a new phenomenon, but within the global capitalist economy labor migration has a quality and quantity that distinguishes it from earlier periods of migration (Castles 2002; Held 1999; Martin and Widgren 2002).

**Social Theories**

Social theories of international migration—in contrast to economic theories—are more focused on the mechanisms that help perpetuate migration streams over time than the factors that first initiate migration (Massey, Arango, Hugo, Kouaouci, Pellegrino, and
Taylor 1993). Migrant network theory highlights how interpersonal relationships between migrants, former migrants, and non-migrants at the origin and destination help to increase and sustain the movement of people across international borders (Massey et al. 1993). Migrants use their social relationships to obtain information about labor markets, housing, transportation, and other aspects of the migration process, which makes the migration process easier. This theory explains why it is not uncommon to find members of a particular immigrant community in the United States originating from the same city or village in Mexico (Massey, Durand, and Malone 2002). Some opponents of this theory have questioned the benevolent nature of migrant networks, citing the aggressive and exploitative tactics used by some farm labor contractors who often use social networks to recruit workers (Krissman 2005; Krissman 2000). Despite these differences in the reasons for these patterns of migration streams, migrant network theory provides a powerful explanation of the mechanisms that maintain migration streams over time.

The theory of cumulative causation, similar to migrant network theory, explains the perpetuation of migration streams over time (Massey 1990; Myrdal 1957). The concept that migration could be “cumulative” or that migration streams develop a kind of momentum was first hypothesized by Gunnar Myrdal in 1957. It was not until the 1990s that the theory of cumulative causation became prominent within international migration studies (Massey et al. 1993). At the heart of this theory is the idea that each prior act of migration changes the social context, both at the origin and at the destination, within which migration occurs. Massey et al. (1993) identify the distribution of income, distribution of land, organization of agrarian production, culture of migration, regional distribution of human capital, and social labeling as the distinct mechanisms causing
migration to become cumulative. This perspective explains why migration streams continue well after the conditions that initiated the migration stream have ended (Massey, Durand, and Malone 2002).

The selectivity of migrants is central to both the migrant network and cumulative causation theories. The initial, or “seed,” migrants to a destination face the highest costs to migration and so therefore tend to be the most selective when it comes to education, prior work experience, and other indicators of human capital (Feliciano 2005). However, as the migration stream continues and the costs of migration begin to lessen, migrants become less selective. Migrant selectivity also influences the type of industries and occupations in which migrants work. Migrants with higher levels of education and work experience are less likely to work in low-skilled or immigrant-dominated industries than migrants with lower human capital. The initial migrants to a new destination are more selective than the migrants that follow them (Leach and Bean 2008).

Assimilation Theory

Assimilation theories describe the decline, and eventual disappearance, of differences between racial and ethnic groups (Alba and Nee 1997; Gordon 1964). Immigration scholars stress that immigrant assimilation is a multifaceted process that includes the decline of cultural, linguistic, residential, income, and occupational differences between the foreign-born groups and the native-born population (Waters and Jimenez 2005). Because the focus of my research is on the spatial and socioeconomic assimilation of Mexican-born farmworkers, the focus of this review will be on these
specific types of assimilation. Assimilation is a holistic process that includes the interaction between many different aspects of social and economic life.

**Spatial Assimilation**

The residential and geographic concentration of immigrants is an important indicator of assimilation into U.S. society (Massey 1981; Massey and Denton 1985). The theory of spatial assimilation applies concepts of social mobility within an ecological framework to explain how immigrants become less residentially segregated as their socioeconomic status increases (Massey and Denton 1985). Spatial assimilation theory hypothesizes that immigrants to the United States will initially settle in ethnic enclaves—urban neighborhoods with large populations of co-ethnics that provide social and economic support—where they are residentially segregated from other racial/ethnic groups, but as their socioeconomic status improves they relocate to cities, suburbs, and neighborhoods with fewer co-ethnics (Logan, Alba, and Zhang 2002; Wahl, Breckenridge, and Gunkel 2007).

In recent decades there has been considerable growth in the number of immigrants living in new destinations outside of traditional gateway cities (Singer, Hardwick, and Brettell 2008). This movement of immigrants to new destinations is in many ways analogous to spatial assimilation (Wahl, Breckenridge, and Gunkel 2007). The basic premise of spatial assimilation is that immigrants are becoming less geographically or residentially segregated from the native-born population. As immigrants move away from traditional settlement areas, or bypass them altogether, the geographic or spatial differences between themselves and the native-born population are declining. Also, implicit in the theory of spatial assimilation is the concept of status attainment or social
mobility. Empirical studies of immigrants in new destinations have found higher earnings and lower rates of poverty compared to their counterparts living in traditional gateway cities and states (Crowley, Lichter, and Qian 2006; Leach 2008). Despite differences in geographic scale between traditional spatial assimilation theory (neighborhood or Census Tract) and the new destinations literature (city, county, or state) this new trend in immigrant settlement exemplifies spatial assimilation, albeit on a much different geographic scale than the theory originally implied.

**Socioeconomic Assimilation**

The socioeconomic assimilation of immigrants is normally measured by changes in earnings and income as well as occupational mobility (Waters and Jimenez 2005). Foreign-born workers typically earn less than native-born workers upon their arrival to the United States (Borjas 1985; Tienda and Singer 1995), and are more likely to work in low-wage industries and occupations (Bean, Leach, and Lowell 2004). While some research has found that earnings differentials between native- and foreign-born workers diminish over time, indicating earnings assimilation, these findings have been contested. Using 1970 Census data, Chiswick (1978) showed that foreign-born males earned less than native-born workers initially but in 10-15 years of experience in U.S. labor markets their earnings were equal to, if not more than, that of native-born workers. Borjas (1985) disputed these findings, arguing that cross-sectional analyses of immigrant earnings masked important changes in the skill composition of recent migration streams. Using a cohort approach rather a cross-sectional design, he found that the earnings of immigrant cohorts grew at a much slower rate than those predicted by cross-sectional studies. He also found that growth in immigrants’ earnings relative to native-born workers was much
slower as well. Subsequent research has shown that there has been a change in the skill composition of recent immigrant groups due in large part to changes in countries of origin (Chiswick 1986; Portes and Rumbaut 1996).

Earnings assimilation is closely related to the other assimilation processes. Empirical research has found that immigrants can experience wage penalties because of limited English language ability (Hamilton, Goldsmith, and Darity 2008; Kossoudji 1988; McManus, Gould, and Welch 1983), legal status (Kossoudji and Cobb-Clark 2002; Tienda and Singer 1995), and occupational segregation (Catanzarite 2002). There has, however, been less empirical research on the earnings of immigrants living in new destinations. Leach (2008) finds that the earnings of recent Mexican-born immigrants are higher in new destinations than in traditional settlement areas.

Occupational mobility, the movement of workers from low-skill and low-wage occupations in the secondary sector to higher paying and more stable jobs in the primary sector, is another indicator of socioeconomic assimilation. The occupational mobility of immigrants typically follows a U-shaped trajectory where there is an initial downgrading in occupational prestige from their last job abroad to their first job in the United States followed by a recovery period in which occupational prestige increases (Akresh 2008). Using data from the New Immigrant Survey¹, Akresh (2006) finds immigrants from Latin America are more likely than immigrants from other countries of origin to experience an initial occupational downgrading upon arrival in the United States.

Given the low wages and harsh working and living conditions associated with agricultural labor, one would expect farmworkers try to move into nonfarm employment as soon as possible. Results from the Mexican Migration Project (MMP) indicate that

¹ The New Immigrant Survey follows a cohort of immigrants that have applied for legal status.
there is an initial stickiness to occupation upon arrival to the United States whereby those employed in agriculture in Mexico are more likely to work in agriculture in the United States but that with time, there is mobility out of agriculture (Kandel 2004). Martin (2002) argues that the farm labor market is essentially a “revolving door” for young Mexican immigrants that allows them to access the broader labor market. If this is truly the case, then it would be expected that a large number of recent migrants to new destinations will initially work in agriculture but then transition to other industries.

**Segmented Assimilation**

Segmented assimilation theory is a framework for understanding the variation in socioeconomic outcomes for different immigrant groups with special attention given to the second generation (Portes and Zhou 1993). While some immigrant groups experience upward social mobility, especially between the first and second generations, other groups experience no change or even downward mobility. Portes and Zhou (1993) posit that the racial characteristics of the immigrant group, their residential location, and the absence of mobility ladders determines if the groups will experience upward or downward mobility. The argument behind segmented assimilation is not the ability or inability of immigrants groups to assimilate but that members of some immigrant groups are more likely to be assimilated into the more successful economic class while others are assimilated into the underclass.

Immigrant assimilation is a longitudinal process and often extends into the second and even third generations (Gordon 1964). In fact, segmented assimilation theory was originally developed to explain the socioeconomic outcomes of the children of immigrants (Portes and Zhou 1993). However, this framework is also useful for
explaining the socioeconomic characteristics of first-generation migrants which provides not only the context for their own assimilation outcomes but are also indicators of the opportunities available to their children to be socially and economically integrated into U.S. society. Valdez (2006) analyzed the earnings of Mexican-born immigrants relative to Mexican Americans in the Southwest and found that for workers in low-skilled occupations there was limited income growth, and often decline, for immigrants that had resided longer in the United States while skilled workers experienced income gains with longer U.S. experience. This research illustrates that assimilation of immigrants from the same country of origin can be segmented based on human capital and employment characteristics (Valdez 2006). Cross-sectional and cohort studies cannot demonstrate the assimilation outcomes needed to conclude that a particular group has experienced downward mobility, but they are useful in describing the context under which socioeconomic assimilation is likely or unlikely to take place.

**New Immigrant Destinations**

The recent growth in the number of immigrants living in new destinations outside of traditional settlement cities and states has been well documented (Durand, Massey, and Charvet 2000; Jensen 2006; Kandel and Cromartie 2004; Singer, Hardwick, and Brettell 2008). Historically, Mexican immigrants in the United States have been geographically concentrated in a few select cities and states along the Eastern Seaboard, California, and the Southwest (Durand, Massey, and Charvet 2000; Hernández-León and Zúñiga 2000; Parrado and Kandel 2008; Waters and Jimenez 2005). For several decades now, Mexican immigrants have been moving out of the “gateway” cities or, as is the case for many
recent immigrants, bypassing traditional settlement cities and states. It is important to note that traditional settlement areas continue to attract the majority of Mexican immigrants, but the number of migrants seeking out new destinations is increasing (Lichter and Johnson 2009).

The demand for agricultural labor helped to establish the traditional Mexican immigrant gateway states. Throughout the 20th Century, Mexican immigrants settled primarily in five states—Arizona, California, Illinois, New Mexico, and Texas—some parts of which were formerly Mexico. In the early 1900s, Texas was the largest receiving state for Mexican migrants. While Mexican immigration to California steadily increased after 1920, it was not until after the creation of the Bracero Program in 1942 that it became the largest receiving state (Durand, Massey, and Charvet 2000). California continues to be the destination state for the largest number of Mexican immigrants, however, the proportion of immigrants settling in California, and other traditional gateway states, began declining in the 1990s (Durand, Massey, and Charvet 2000; Hernández-León and Zúñiga 2000).

The growth of the Hispanic population outside of traditional settlement cities and states has been phenomenal, not only because it has been so geographically extensive but also the sheer magnitude of growth in new destinations. Durand et al. (2000), using census data from 1910-1996, show how the geography of Mexican migration has shifted from being a regional to a national phenomenon. Their analysis indicates that the percentage of all Mexican immigrants living in non-gateway states increased sharply from 12.8 percent in 1990 to 30.9 percent in 1996. Hernández-León and Zúñiga (2000) find similar evidence of Mexican immigrant communities being established in the textile
producing regions of the South during this same time period. Some research has focused on the establishment of new gateway cities such as Atlanta, Charlotte, Dallas, Portland, Sacramento, Washington D.C. and their suburbs which have become major destinations for new immigrants to the United States (Singer, Hardwick, and Brettell 2008).

Rural areas have also become settlement destinations for recent immigrants (Farmer and Moon 2009; Jensen 2006; Lichter and Johnson 2006). Not surprisingly, most immigrants live in metropolitan areas where they have greater access to other co-ethnics, low-cost housing, and employment opportunities. Until recently, the few nonmetro areas with large proportions of immigrants were located in the Southwest along the Mexico border. From 1990-2000, the immigrant population in the United States geographically dispersed away from metro gateway cities into less densely populated areas including nonmetro counties (Lichter and Johnson 2006). Others have noted the growth of the Hispanic\textsuperscript{2} population in nonmetro areas during this same time period. Kandel and Cromartie (2004) documented the dramatic increase in the number of Hispanics living in nonmetro areas and found that by 2000, over half of all Hispanics living in nonmetro areas were outside of the Southwest. While some of the growth in the nonmetro Hispanic population comes from natural increase (Johnson and Lichter 2008), the majority is from migration.

Other studies have highlighted the demographic, educational, and occupational differences between immigrants living in nonmetro and metro areas. Using data from the Current Population Survey (CPS), Jensen (2006) found that new immigrants to rural areas are more likely to be of working age, married, from Mexico, have lower

\textsuperscript{2} While not all Hispanics are immigrants, a disproportionate amount of Hispanics in the United States are either immigrants themselves or children of immigrants.
educational attainment, and to be underemployed than new immigrants in urban areas. He also found that nearly 14 percent of recent immigrants in rural areas work in agriculture and that they are twice as likely as the native born to work in agriculture. Farmer and Moon (2009) limited their analysis to Mexican migrants and concluded that after 1960, migrants choosing rural destinations were older, less educated, had lower English language ability, more often married, and more likely to be undocumented than migrants choosing metro areas. However, many of these differences reversed in the mid-nineties after the passage of the North American Free Trade Agreement (NAFTA) (Farmer and Moon 2009).

Explaining New Destination Migration

There are several explanations for the dispersion of Mexican immigrants to new immigrant destinations including immigration policy, labor market saturation, and economic restructuring. Immigration reforms adopted in the late 1980s altered the geographic distribution of Mexican migrants. Prior to the passage of IRCA, movement back and forth between Mexico and the United States was relatively common. Mexican migrants would work in the U.S. for fairly short durations of time before returning home. The most common destination states were almost always within close geographic proximity of Mexico, which facilitated their eventual return. After the passage of IRCA, however, this pattern changed. Amnesty provisions under IRCA created opportunities for mobility to more distant regions of the United States, while at the same time, increased border enforcement shifted the entry points for undocumented migrants to other places along the Mexico-United States border and created disincentives for migrants to return to
their origin country by increasing the costs of migration (Massey, Durand, and Malone 2002).

Network saturation in traditional immigrant settlement cities is another explanation for immigrants settling in new destinations (Light 2003). Focusing on housing and labor markets in Los Angeles, California, Light argues that in many traditional settlement cities housing and labor markets have become saturated and the lack of work opportunities and affordable housing essentially “deflects” recent immigrants (Light and von Scheven 2008; Light 2006; Light 2003). This approach focuses on the supply of immigrants and the ability of a particular geographic area to absorb the growing number of immigrant households and workers.

Economic restructuring, especially in rural areas, has been another explanation for the spatial deconcentration of nonmetro Hispanics (Crowley, Lichter, and Qian 2006; Fairchild and Simpson 2004; Gozdziak and Bump 2004; Kandel and Parrado 2005). Crowley et al. (2006) argue that economic restructuring in rural areas outside of traditional Hispanic settlement cities has increased the demand for low-wage workers and that that demand is being filled by Mexican immigrants. Their research also found that these immigrants experience lower rates of poverty than those in gateway cities suggesting that geographic mobility leads to increased economic opportunity.

Restructuring of the meat processing industry in the Midwest has also attracted Hispanic immigrants to that region (Kandel and Parrado 2005). The consolidation of some of the largest carpet companies in the rural South has created a demand for low-skilled workers which has been filled by Mexican immigrants (Hernández-León and Zúñiga 2000). Similarly, the growing scale of poultry processing in the South has also attracted Mexican
immigrants to that region (Gozdziak and Bump 2004; Hernández-León and Zúñiga 2000).

**Agricultural Restructuring**

Another explanation for the settlement of immigrants in new destinations that has been overlooked in the literature is the restructuring of the agricultural production sector and the changing demand for hired farm labor. The food and fiber system in the United States has undergone dramatic structural changes since World War II (Lobao and Meyer 2001). A precipitous decline in the number of farms, polarization by farm size, vertical integration of food production and processing, the industrialization of the livestock sector, and the replacement of hired labor for family labor have led to a system of agricultural production that is hardly reminiscent of the bucolic “family farm” system that once dominated the U.S. farm sector. In recent decades, farmers in the United States have had difficulty realizing profits as the costs of inputs steadily increased at the same time commodity prices declined. Farmers often adapt to this cost-price-squeeze by expanding their operations and intensifying production (Bell 2004). It is this intensification of production that is driving agricultural restructuring in the United States. This section reviews the literature on agricultural restructuring, paying particular attention to how changes in the farm sector are related to the demand for labor in new destinations.

The declining number of farms\(^3\) in the United States is both a cause and consequence of agricultural restructuring (Jensen 2005). Since the 1960s, the total number of farms has declined from just over 3.7 million in 1959 to 2.2 million in 2007.

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\(^3\) The Census of Agriculture defines a farm as any place from which $1,000 or more of agricultural products were, or normally would be, produced and sold during the Census year.
(Albrecht and Murdock 1988; U.S. Department of Agriculture 2009b). A greater indicator of structural change, however, is the type of farms that remain after decades of decline. The trend until the 1970s was the consolidation of production as the number of farms declined but the size of farms increased. Beginning in the 1970s, the number of small farms also increased relative to mid-sized farms. Sociologists of agriculture refer to this phenomenon as the polarization of the farm sector or the “disappearing middle” (Buttel and LaRamee 1991). From 2002-2007, there was actually a slight (4%) increase in the total number of farms in the United States with all of the growth coming in the largest ($245,000 or more) and smallest (less than $1,000) annual sales classes of farms (U.S. Department of Agriculture 2009b).

The consolidation of production in agriculture is part of a larger trend toward the overall industrialization of the farming system. Large-scale operations, corporate or extra-local ownership, confined animal feeding operations (CAFOs), vertical integration, and a large hired workforce are all characteristics of an industrialized farming system (Bell 2004). The industrialization of agriculture is by no means a new phenomenon; in fact, researchers have been studying it since the 1930s when Carey McWilliam’s (1939) book *Factories in the Field* documented migrant labor on industrial farms in California. A few years later, Walter Goldschmidt’s classic study of industrial agriculture and community well-being brought additional attention to the social and economic impacts of this emerging system of agricultural production (Goldschmidt 1947).

The industrialization of agriculture has not been evenly distributed across geographic regions in the United States. Industrial farming first developed in California where the availability of cheap land, rapid population growth and urbanization, an
extensive irrigation system, and a large supply of low-wage labor allowed an industrial system to flourish in place of a the smaller-scale and family-run farm systems in other regions of the country (Gilbert and Wehr 2003; Mitchell 1996; Pfeffer 1983). The industrial style of production that has long characterized California agriculture has now spread throughout the United States. There are many examples, especially in the livestock industry, of the regional shift in industrialized agriculture (Abdalla, Lanyon, and Hallberg 1995). Megadairies—dairy farms with more than 500 milk cows—until recently have been primarily found in California, are becoming more common in the Midwest and Northeast (Cross 2006). Large-scale poultry production is becoming increasingly concentrated in the South (Gozdziak and Bump 2004). Finally, research on pork production has found that there has been substantial industrialization especially in the Corn Belt region (Roe, Irwin, and Sharp 2002; Sharp, Roe, and Irwin 2002). However, many of these commodities, e.g. hog production, are not labor intensive and so will not have large impacts on the distribution of hired farm workers.

The relationship between agricultural restructuring and hired farm labor has been mixed. Overall, mechanization has nearly eliminated labor requirements for many commodities while the consolidation and industrialization of production has increased the demand for labor beyond what can be supplied by the farm household. In 2007, there were over 482,000 farms—roughly 20 percent—employing over 2.6 million hired farmworkers (U.S. Department of Agriculture 2009a). The majority of these hired farmworkers, 65 percent, are seasonal (working less than 150 days a year) with the remaining 35 percent working more year-round. Farmworkers are also more likely to work in crop than livestock production but the number working in livestock production
has been increasing in recent years. Since 1980, there has been a shift in the regional
distribution of hired farm labor as the proportion in the South and Midwest declined
while the West and Southwest regions increased (Kandel 2008); however, this is the trend
in the regional distribution of all hired farm laborers and not Mexican-born farmworkers
specifically.

These changes in the structure of agriculture have been part of the larger Fordist
and post-Fordist transformations of the U.S. Economy (Buttel 2001; Lobao and Meyer
2001). The Fordist economy was driven by the expansion of manufacturing and
production with an emphasis on economies of scale and technology. In U.S. agriculture,
this transformation was characterized by the dramatic increase in the size of farms and
increased intensity of production. In contrast, the post-Fordist economy seeks to
capitalize on small-batch and niche production, specialization, information technologies,
and the feminization of the workplace all of which are evident in the emerging small farm
sector of the food and fiber sector in the United States (Lobao and Meyer 2001). The
emergence of the post-Fordist economy does not necessarily mean an end to the Fordist
economy as there is generally some overlap between these two systems production and
consumption. In applying this theoretical perspective to the agriculture sectors,
researchers are better able to explain the bifurcated farm system that has evolved in
recent years (Buttel 2001). However, the ways in which hired farm labor is utilized
within each sector of this segmented farm system is unknown.

This section reviewed the literature on agricultural restructuring in the United
States. As the farm sector continues to change, it is unclear exactly how this will affect
the demand for hired farm labor. Another question that has not been addressed in this
literature is exactly which structural changes are most related to hired labor. The next section chronicles the close relationship between hired farm labor and Mexican migration in the United States.

**Agricultural Labor and Mexican Migration**

The history of Mexican migration to the United States has largely been driven by the demand for low-wage workers in agriculture. In the early 1900s, restrictive immigration policies against China and Japan created labor shortages in western agriculture that were filled by Mexican immigrants (Massey, Durand, and Malone 2002). These migrants were largely recruited by aggressive labor contractors until the beginning of World War I when the U.S. Government began recruiting Mexican workers directly (Reisler 1976). Mexican migration slowed during the 1920s as growing feelings of nationalism created a harsh social environment for immigrants. The Great Depression of the 1930s further slowed immigration from Mexico and other countries. During this time, Mexican farmworkers were replaced by poor rural farmers from the Midwest and other parts of the U.S. who were forced to relocate because of economic and ecological hardship (Gregory 1989).

The most substantial wave of Mexican labor migration to the U.S. began in 1942 with the creation of the Bracero\(^4\) Program, a U.S. Government initiated bilateral labor recruitment program with Mexico. The Bracero Program was initially created in 1942 to overcome labor shortages during World War II and continued until 1964. During this

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\(^4\) The word Bracero comes from the Spanish word *brazo*, meaning arm. This term denotes manual or unskilled laborers.
time over 4.5 million Mexicans entered the U.S. legally as manual farm laborers (Massey and Liang 1989). The intent of the Bracero Program—like other guestworker programs—was to allow the U.S. to import workers during labor shortages while at the same time discouraging the permanent settlement of seasonal workers. Braceros were not allowed to bring dependents, had limited geographic mobility, and were restricted to employment in agriculture. These restrictions helped to established a system of circular migration between Mexico and the United States for farmworkers (Martin 2002). Despite policies that restricted Braceros’ geographic and economic mobility, many did settle in the United States and were joined by family members. In addition to those legally sanctioned to immigrate under the program, over 5.3 million\(^5\) undocumented Mexican immigrants were apprehended during this same time period (Martin, Fix, and Taylor 2006). The Bracero Program established a lasting migration stream between the U.S. and Mexico (Massey, Durand, and Malone 2002).

The Bracero Program ended in 1964 when the U.S. Congress failed to renew it. Mexican farm labor migration, however, continued unabated despite dramatic changes in the structure of agricultural labor. The organization of farmworker labor unions in the 1960s had the short-term effect of raising wages and improving working conditions for farmworkers but had the long-term effect of decreasing demand for farm labor as agricultural companies invested in new mechanized farm equipment\(^6\) (Martin et al. 2006). At that time, employers increased the practice of hiring through labor contractors rather than hiring migrant workers directly in an attempt to circumvent the labor unions. Border enforcement increased substantially after 1964. During this time, most Mexican migrants

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\(^5\) Both the number of Braceros and the number of apprehensions can include the same person multiple times.

\(^6\) See Martin, Fix, and Taylor (2006) for a discussion of the mechanization of tomato harvesting.
were “target earners” who worked in the United States until they reached a certain level of savings and then returned to Mexico (Massey, Durand, and Malone 2002).

Legislation passed in the 1980s created both opportunities and barriers for Mexican farmworkers. In 1986 the Immigration Reform and Control Act (IRCA) was signed into law to discourage undocumented migration to the United States. The strategy of IRCA was three-fold. First it placed sanctions on employers that knowingly hired undocumented migrants. Second it increased the amount of resources to the U.S. Border Patrol. And finally, IRCA provided amnesty for undocumented migrants who could prove continuous residence in the United States since January 1st, 1982. Fearing labor shortages in agriculture, an additional exception for farmworkers was included in IRCA. The Special Agricultural Workers (SAW) program granted amnesty to undocumented immigrant workers who could prove that they had worked 90 days of farm labor in the United States during 1986. Nearly 1.2 million farmworkers received citizenship under IRCA, 90 percent of whom were from Mexico (Martin, Fix, and Taylor 2006).

Currently, U.S. farmers can recruit foreign workers through the H-2A temporary visa program which was initially created in 1964 after the termination of the Bracero Program but was later expanded under IRCA. The H-2A program requires that farmers and growers must first demonstrate that they are unable to secure domestic labor and then are allowed to contract with foreign workers and bring them legally to the United States under temporary work visas. Under this program, the employer is legally obligated to provide immigrant workers with housing, meals, travel to the worksite, worker’s
compensation, wage statements, and pay workers at least the minimum wage\(^7\). Travel expenses from the origin country to the United States are initially paid by the migrant but must be reimbursed by the farmer/grower after the worker has fulfilled a portion of their contract. This aspect of the H-2A program significantly impacts both the geographic distribution of farms that employ H-2A visa workers and the country of origin of participants. The H-2A program is extremely underutilized with less than 10 percent of immigrant farmworkers in the United States carrying H-2A visas. However, the proportion of farmworkers with H-2A visas is greater in the South and Northeast where employers are more likely to recruit immigrants from Jamaica and other Caribbean countries because of the closer geographic proximity and reduced travel costs than from Mexico (Griffith 2006).

Farm labor continues to be an important aspect to immigration policy in the United States. There is currently proposed legislation in the U.S. Congress to implement a new farm labor program called AgJOBS that will not only prevent labor shortages in the agricultural sector but also protect the rights of immigrant workers from exploitation (Martin 2003). The AgJOBS program would be very similar to the H-2A visa program, however, it is expected to have a much larger number of participants. It is unclear at this time how the program will impact the geographic distribution of Mexican-born farmworkers, but, if passed, this program would prove to be an additional mechanism whereby Mexican-born immigrants can access farm employment opportunities in new destinations.

\(^7\) Employers are required to pay the highest of the 1) adverse effect wage rate which is determined by the U.S. Department of Labor, 2) the “prevailing rate” for a given crop in that area, or the 3) federal minimum wage.
A Profile of Contemporary Farmworkers

**Demographic Characteristics**

Estimates of the total number and demographic composition of hired farmworkers in the United States vary depending on the data source and the specific definition of “farmworker.” Using data from the Farm Labor Survey (FLS) conducted by the United States Department of Agriculture (USDA), Kandel (2008) calculated that there were 1.01 million hired farm workers in the United States in 2006. This estimate includes both native- and foreign-born workers of which 37.3 percent were born in Mexico, 4.7 percent in other foreign countries, and that 57.8 percent of hired farm workers were born in the United States. Immigrant workers are most often employed in the harvest of fresh fruits and vegetables and other perishable crops. Data from the National Agricultural Workers Survey (NAWS) — a nationally representative survey of crop workers conducted by the U.S. Department of Labor—shows that from 2001-2002 nearly 78 percent of hired crop workers were foreign-born and that the vast majority of these (75%) were from Mexico (Carroll, Samardick, Bernard, Gabbard, and Hernandez 2005).

The age, sex, and marital status distribution of hired farmworkers is considerably different from workers in other occupations. Using data from the Current Population Survey (CPS), Kandel (2008) finds that the median age of hired farm workers is 34 years compared to 40 years for all wage and salary workers. It is interesting to note that the median age for noncitizen farmworkers is the same as that of noncitizen workers in other occupations—34. Crops workers are slightly younger with an average age of 33 and more than half of all crop workers under the age of 31 (Carroll et al. 2005). The gender
distribution is the most dramatic difference between farmworkers and workers in other industries. Nearly 81 percent of all hired farmworkers are male compared to just 52 percent among wage and salary workers (Kandel 2008). Hired farmworkers are less likely than other workers to be married but more likely to have children. Many crop workers, especially foreign-born workers, live away from their nuclear family including 34 percent of parents and 30 percent of childless married workers (Carroll et al. 2005).

The immigration-related characteristics of farmworkers are also unique from other foreign-born workers. On average, farmworkers are more recent arrivals to the United States than workers in other occupations (Carroll et al. 2005; Kandel 2004; Kandel 2008). Farmworkers also have very low English language ability. Hired farmworkers are more likely to be noncitizens than other workers (Martin 2003b). From 2001-2002, more than half (53%) of all crop workers were unauthorized to work in the United States, 25 percent were citizens, 21 percent were legal permanent residents, and only 1 percent were legally employment-eligible by some other means (Carroll et al. 2005).

Geographic Distribution of Farmworkers

The geographic distribution of farmworkers is closely related to the type of commodities produced in each region. The greatest labor-requirements are in the fresh fruits and vegetables (FFV), dairy, and horticulture sectors. While dairy and horticulture are more nationally distributed, fresh fruits and vegetables are primarily clustered in the Southwest and along the West Coast. In 2006, California and Texas accounted for nearly one-third of all hired labor expenditures in the United States (Kandel 2008). Labor-intensive commodities such as fresh fruits and vegetables are produced in other regions
of the country and there are established migration corridors whereby farmworkers move throughout the Southeast, Midwest, or Northwest (Friedland and Nelkin 1971; Griffith 2006; Griffith and Kissam 1995).

There has been relatively little research on the process of migrant farmworkers becoming more settled farm laborers. Fairchild and Simpson (2004) document the recent increase in the number of Mexican immigrants moving to the Pacific Northwest, many of whom are agricultural workers. Other research has described how migrant farmworkers were originally attracted to the rural communities of the Shenandoah Valley to work in the apple harvest but then settled because of opportunities to work in poultry processing plants (Gozdziak and Bump 2004). There is also a small, but growing literature on the increasing number of immigrant workers employed on dairies in the Northeast and Midwest (Harrison, Lloyd, and O’Kane 2009; Maloney 2002). Although these regions have historically been dominated by small family-owned and operated dairy farms, there has been a rapid increase in the number of large megadairies (500 or more milk cows), which require hired farmworkers.

**Economic Well-being of farmworkers**

Immigrant farmworkers are among the most impoverished and marginalized groups in the United States, a fact that has probably received as much attention in the popular press as it has the scholarly literature (Griffith and Kissam 1995; Martin, Fix, and Taylor 2006). John Steinbeck’s classic novel, *The Grapes of Wrath*, brought national attention to the plight and poverty of hired farmworkers in California during the Great Depression and Edward R. Murrow’s (1960) documentary *Harvest of Shame* showed that
the harsh working and living conditions of hired farmworkers had only worsened. Farmworkers are poor for two reasons. First, the wages for hired farmworkers are roughly half of that of workers in other industries. Second, farmworkers are typically employed fewer weeks out of the year (Martin 2003b). In addition to lower incomes, the working and living conditions of farmworkers are often dangerous and substandard (Villarejo 2003; Ziebarth 2006).

As mentioned above, the high poverty rates of farmworkers are partly due to lower wages in agriculture compared to other industries. In 2006, the median hourly earnings of hired farmworkers were 62 percent lower than those of all other wage and salary workers (Kandel 2008). While these findings include both native- and foreign-born workers, similar inequalities persist even after controlling for legal status. The median hourly earnings of noncitizen farmworkers are roughly 33 percent lower than those of other noncitizen workers (Kandel 2008). One reason that farmworkers earn lower wages than other workers is that they are not protected under the same federal labor laws (Griffith and Kissam 1995; Martin 2003b). Farmers have long argued that the unique labor requirements of food and fiber production—agricultural exceptionalism—should exclude it from labor laws including minimum wage and overtime pay. While the arguments of seasonality and perishability used by farmers to elude labor laws could be made by producers in other industries, the political power of growers and farmer organizations has allowed agricultural exceptionalism to guide labor laws in the United States and consequently negatively impact the earnings of farmworkers.

Another reason for the high poverty rates of farmworkers is that they are usually employed fewer weeks out of the year than workers in other industries. In contrast to
other economic sectors, agricultural production is a sequential, seasonal, and time-intensive process where labor requirements vary by commodity and with each stage of production (Mann and Dickinson 1978). The most labor-intensive commodities are fresh fruits, vegetables, and horticulture that require the most labor during their harvest. Because the harvest period for most crops is relatively short (2-3 weeks), many farmworkers “follow the crops” or migrate to the next harvest. Despite these efforts, the median weeks worked for migrant farmworkers is roughly half of that of farmworkers that do not migrate, 19.6 weeks and 38.9 weeks, respectively (Kandel 2008). While there are some indications that immigrant farmworkers are beginning to be employed in more year-round commodities such as dairy or other types of livestock production, the number of farmworkers in this sector relative to crop workers is quite small (Harrison, Lloyd, and O’Kane 2009; Maloney 2002).

The extent to which immigrants in the United States utilize Public Assistance programs has been debated extensively in the literature (Borjas and Trejo 1991; Tienda and Jensen 1986). While the popular misconception is that immigrants are more likely to receive welfare than the native-born population, empirical research has shown that welfare receipt is not higher for immigrants (Jensen 1988). Despite extremely high rates of poverty, very few farmworkers receive Public Assistance (Findeis, Snyder, and Jayaraman 2005). In an analysis of crop workers using data from the National Agricultural Workers Survey (NAWS), Findeis et al. (2005) found that less than 3 percent of farmworker’s households had received AFDC or TANF benefits and slightly higher participation rates for other means-tested programs such as Food Stamps (12.67%), Medicaid (14.97%), and WIC (11.21%). Kandel (2008) finds that farmworkers
with authorization to be in the United States are most likely to use Public Assistance programs. The higher participation rates in Food Stamps, Medicaid, and WIC are most likely due to specific provisions within each for farmworkers\(^8\) (Martin 2003b). The extent to which living in new destinations is related to their use of Public Assistance programs has not been explored in the literature.

### Research Questions

This analysis contributes to the literature on Mexican-born immigration to new destinations in several ways. First it documents the growth of a particular occupational group—farmworkers—to new destinations. Second, it measures the extent to which agricultural restructuring is increasing the demand for hired farm labor in new destinations. Finally, this research explains differences in earnings between traditional agricultural settlement states and new agricultural destination states.

The following research questions and expectations were derived from the theoretical and empirical literature reviewed above:

1. *Over time, how has the geographic distribution of Mexican-born farmworkers in the United States changed?*

   a. Given that the Mexican-born immigrant population has become increasingly geographically dispersed in recent decades, I expect that many of the immigrants moving to new destinations will find employment

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\(^8\) Farmworkers receive special recognition within the Food Stamps program and are eligible for emergency food relief. Also, the Migrant-Education and Migrant-Health programs help facilitate farmworker’s access to WIC and Medicaid.
in agriculture. Therefore, Mexican-born farmworkers will become more geographically dispersed as well.

2. *What differences are there in the demographic and socioeconomic composition of Mexican-born farmworkers living in traditional settlement states (California and Texas) and those in new destination states? How do these differences change over time?*

   a. Cumulative causation theory posits that the initial migrants to a destination are more socially and economically selective than later migrants. Because there are relatively few Mexican-born farmworkers living outside of traditional settlement states, it is expected that Mexican-born farmworkers in new destinations will have greater human capital (work experience and education), have better English language ability, and have more years of experience in the United States.

   b. Cumulative causation theory also argues that as the migration stream becomes more established that migrants become less socially and economically selective than the earlier migrants. As the share of Mexican-born farmworkers in new destinations increases, there will be fewer differences in the demographic composition and immigration-related characteristics between destinations.

3. *Do the earnings of Mexican-born farmworkers differ between new destination and traditional settlement areas?*

   a. The earliest economic theories of migration focused on wage differentials between origins and destinations. Surprisingly, these theories have not been applied to the recent growth of Mexican-born immigrants in new destinations. I expect that changes in the geographic distribution of Mexican-born farmworkers will be related to differences in earnings between destinations.

4. *How have differences in earnings across these destination types changed over time?*

   a. According to segmented assimilation theory, the socioeconomic status of some immigrant groups increases as they are assimilated into the mainstream society and economy. Other groups, however, experience downward mobility as they are assimilated into the underclass. As the share of Mexican-origin farmworkers in new destinations increases, I expect that their earnings will decrease.
5. How is the demand for hired farm labor different in traditional settlement states (California and Texas) from the demand for hired farm labor in new destination states (Other States)?

   a. Farm labor in the United States has historically been concentrated in states with large fresh fruit and vegetable sectors. The workers in these states are also more likely to be seasonal.

      i. The percentage of seasonal and migrant farmworkers will be higher in traditional states than in new destinations.

6. How does agricultural restructuring affect the demand for hired farm labor?

   a. The farm sector in the United States has undergone considerable change in recent decades. Many of these changes are likely to increase the demand for hired labor.

      i. As the size of farms and the scale of production in a county increases, the demand for hired farm labor will also increase.

      ii. Increasingly, farmers rely on off-farm income because their operations are not profitable. I expect that in counties where the percentage of farmers who report their principal occupation as farming increases, there will be an corresponding increase in hired labor.

      iii. In recent years, the average age of farm operators has risen. Often, farmers begin to downsize their operations as they near retirement. As the average age of farmers in a county increases, there will be a decrease in the demand for hired labor.

      iv. Variation in the types of farm ownership systems reflects different approaches to production. While today, the majority of farms in the United States are family or individually owned, the percentage of farms that are corporately owned is increasing. As the percentage of farms in a county that are family or individually owned increases, there will be a decrease in the demand for hired labor. Conversely, as the percentage of farms that are corporately owned increases, the demand for hired labor will increase.

7. What differences are there by destination type in how agricultural restructuring is related to the demand for hired farm labor?
Chapter 3

Data and Methods

This chapter describes the data and methods that will be used to address the research questions outlined at the end of Chapter 2. The purpose of this research is to explain the growth of Mexican-born farmworkers in new destinations, highlight how agricultural restructuring is affecting these changes, and measure the impact of living in a new destination on the economic well-being of farmworkers. This chapter is divided into three sections. First, I provide a review of sources for data on agricultural labor in the United States at both aggregate and individual levels. Next, I describe the Public Use Microdata Samples (PUMS) data as well as the Census of Agriculture data and provide justification for using these data in the analyses. I then outline the measures and methods that will be used in 1) the changing spatial distribution and agricultural restructuring analysis, 2) the analysis on the changing earnings inequalities of Mexican-born farmworkers, and 3) the agricultural restructuring and the demand for hired farm labor analysis.

Farm Labor Data

National-level analyses of foreign-born farmworkers in the United States are challenged by a lack of a single data source that can provide a comprehensive profile of this population (Kandel 2004; Kandel 2008). Studies of hired farm labor at the national level have generally relied on data from one of several sources including the National
Agricultural Workers Survey (NAWS) (Carroll et al. 2005; Findeis, Snyder, and Jayaraman 2005), Census of Agriculture (Kandel 2008; Martin and Taylor 2003), Farm Labor Survey (Kandel 2008), the Mexican Migration Project (MMP) (Kandel 2004), or the Current Population Survey (Carroll et al. 2005; Kandel 2004; Kandel 2008). While several of these surveys are designed specifically to measure trends in agricultural labor or production, others are population surveys from which researchers select samples of farmworkers. The following review of strengths and limitations helps to contextualize decisions made regarding which data sets are analyzed in this study.

The NAWS is an employment-based survey of crop workers conducted annually by the U.S. Department of Labor (Carroll et al. 2005). The purpose of the NAWS data is to provide accurate and detailed statistics on hired crop workers in the United States. The NAWS is conducted in three cycles each year to account for the seasonal nature of farm work, and because this is a transitory population, respondents are interviewed at their place of work rather than at their residence. A multi-stage sampling process is used to ensure that the survey is nationally representative. This survey includes questions on the demographic, economic, and immigration-related characteristics of crop workers. Because this data set is limited to just crop workers, it excludes the growing number of Mexican-born farmworkers in the livestock and dairy industry.

The Census of Agriculture is a national inventory of the farm sector conducted every five years by the National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture. Its main purpose is to provide detailed statistics on the nation’s food and fiber sector. The Census of Agriculture provides the most complete

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9 The multi-stage sampling process starts with 12 regions and 80 Farm Labor Areas (FLA) from which counties and farms are randomly selected.
geographic coverage of the structural characteristics of the farm sector including hired farm labor of any other data set (Kandel 2008). These data include information on the number of hired farmworkers, number of farms with hired labor, and labor expenses at the national, state, and county levels. The Census of Agriculture does not include information on the country-of-origin of hired farm laborers. Micro level data from the Census of Agriculture are not available and so analyses with this data are limited.

The Farm Labor Survey is conducted by the U.S. Department of Agriculture and is a quarterly survey of approximately 14,500 farms (Kandel 2008). This survey provides the most up-to-date information on the number of farmworkers in the United States and is used to predict labor shortages in this industry. The data are reported at both the national and regional levels. While these data provide accurate estimates of total number of hired farm workers, they do not include characteristics of the farm labor population beyond the number of workers, average hours worked, and wage rates. Furthermore, these data do not include information about the immigration status of farmworkers.

The Mexican Migration Project (MMP) is a longitudinal study of migration that samples respondents in both Mexico and the United States. The main purpose of these data is to provide detailed information specifically about migrants from Mexico to the United States as well as the migrant-sending communities (Durand, Massey, and Mexican Migration Project. 2004). Kandel (2004) used the MMP to develop a profile of demographic and socioeconomic characteristics of Mexican immigrants working in U.S. agriculture. However, these data provide only limited information about the type of U.S. employment for migrants and cannot be used to accurately estimate the total number of Mexican-born farmworkers in the United States or their geographic coverage.
Finally, researchers have used the Current Population Survey (CPS) to study the earnings of hired farmworkers (Kandel 2008). The CPS is a monthly survey of approximately 50,000 households in the United States and is conducted by U.S. Census Bureau. The CPS is the primary source of information and statistics on the labor force in the United States. While these data contain considerable detail on the demographic, economic, and work characteristics of the U.S. population, this survey undercounts the foreign-born, especially those that are undocumented (Farley and Alba 2002; Massey and Capoferro 2004). Findings from the NAWS indicate that more than 50 percent of all hired farmworkers do not have legal documentation to work in the United States (Carroll et al. 2005). Because of this, the CPS would not be an appropriate data source for studying Mexican-born farmworkers in the United States.

In sum, a significant challenge to the study of immigrant farmworkers in the United States is the limited availability of national-level data on this population. While there are data sources specifically on subsets of agricultural workers or hired farm labor, these data sets are either limited to a narrow set of commodities or they do not include indicators of nativity. Another strategy used by analysts has been to select samples of farmworkers from nationally-representative data such as the Current Population Survey (CPS); however, these data often have very small samples of foreign-born workers making geographically extensive analysis problematic. To overcome these limitations, the data for this research come from the Public Use Microdata Samples (PUMS) of the Decennial Census and the American Community Survey (ACS) as well as the Census of Agriculture. A more detailed description of these data is presented below.
Data

The data for this research come from the Integrated Public Use Microdata Series (IPUMS) and the Census of Agriculture. The IPUMS data are one of the most widely used data sources for studying immigration because of their large sample sizes. Although these data also undercount immigrants, they still contain larger samples of the foreign-born population than other population surveys. The Census of Agriculture provides the most extensive geographic coverage of farm labor including statistics on total hired labor and migrant labor. While these data do not capture immigrant farm labor directly, they are an important source of information on the demand for hired labor.

Integrated Public Use Microdata Series (IPUMS)

The Integrated Public Use Microdata Series (IPUMS) are individual-level data that include the Public Use Microdata Samples (PUMS) from the U.S. Decennial Censuses and the American Community Survey (ACS) that have been synthesized across different census years (Ruggles, Sobek, Alexander, Fitch, Goeken, Hall, King, and Ronnander 2004). The IPUMS data are commonly used in immigration research because the large sample size ensures a large enough sample of immigrants to perform statistical analyses. This is especially important for comparing across geographic units where the sample of immigrants in some units might be marginal. For this research, I combine data from the 1980, 1990, and 2000 Decennial Census and the 2005-2007 American Community survey from the IPUMS files.
The Decennial Census is a full enumeration of the U.S. population conducted every ten years by the U.S. Census Bureau. While its main purpose is to reapportion seats in the U.S. House of Representatives, the Decennial Census is the most comprehensive source of demographic, economic, and housing data on the U.S. population. There are two forms of the census questionnaire that are mailed to households. The first, or short-form, is sent to all households and solicits demographic information—age, sex, race—of each member of the household. The second, or long-form, includes these same demographic questions plus more detailed questions about the demographic, economic, social, and housing characteristics of each member of the household. The long-form is only sent to a sample of households—approximately 1 in every 6 households.

The specific census data that I will use in this research come from the 1% and 5% samples of the 1980, 1990, and 2000 Decennial Censuses. The 1% percent is a 1-in-100 random sample of the entire U.S. population while the 5% is a 1-in-20 random sample. In order to increase the sample of Mexican-born farmworkers in the data, I combine these two samples and adjust the weights. This adjustment is made by multiplying the person weight from the 1% sample by .167 (1/6) and the person weight from the 5% sample by .833 (5/6). The final sample then includes 6 percent of the entire U.S. population.

The American Community Survey (ACS) is a sample survey conducted by the U.S. Census Bureau to provide intercensal estimates of population size and composition, social and economic characteristics, and housing conditions for communities. To conduct this survey, the Census Bureau samples approximately 3 million households in the United States and Puerto Rico annually. The ACS questionnaire is very similar to the long-form of the Decennial Census. The sampling frame for the ACS consists of housing units (HU)
and group quarters (GQ) from all counties and county equivalents in the United States. A requirement of the ACS design is that housing units and group quarters can only be sampled once every five years and so the sampling frame is randomly divided into five equal sub-frames. The sampling units within a sub-frame are randomly assigned months to receive the mail questionnaire.

For this research, I am pooling data from the 2005-07 American Community Survey. The ACS data in 2005-07 is a 1-in-100 random survey of the U.S. population. Again, I am pooling the data across years to increase the number of Mexican-born farmworkers in the sample. This requires that the weights be adjusted by multiplying the person weight from each sample by .333 (1/3).

The sample of Mexican-born farmworkers used in this analysis was selected from the PUMS and ACS data using birthplace and occupation variables. The first step in doing this was to identify the Mexican-born population. Individuals who were born in Mexico, excluding those born abroad to American parents, were selected as Mexican-born. The next step was to identify farmworkers. One advantage of using the IPUMS samples is that they include variables that have been synthesized across different years to ensure that variables are comparable. One such variable is the occupation code from the 1950 census (occ 1950), which has been reproduced in the subsequent IPUMS files. Using this variable, I was able to identify those Mexican-born individuals with the occupation “farm laborers, wage workers.”

**Variables and measures**

This section describes the specific variables and measures from the IPUMS data that were used in the analyses. Variables are grouped into the following categories—
residence, demographic, immigration-related, economic, poverty, and work characteristics. **Residence.** The geographic identifiers used in this analysis include state and region. **State** of residence was used to measure the spatial distribution of Mexican-born farm workers. Cases where state of residence was unidentified were excluded from the analysis. The variable **Region** was recoded into four geographic areas—Northeast, Midwest, South, and West—following the Census definitions.

**Demographic characteristics.** The demographic characteristics include age, sex, marital status, and educational attainment. **Age,** which was measured in years, was recoded into five categories with shorter intervals in the earlier age periods to reflect the young age structure of this population for the spatial distribution analysis. A continuous measure of age and a nonlinear transformation (age-squared) were used in the earnings analysis. **Sex** is a dichotomous variable with females serving as the reference group. The variable **marital status**\(^{10}\) includes three mutually exclusive categories: married; never married; separated, divorced, and widowed. The living arrangements of individuals was measured by the their **relationship to householder** which is categorized into those living with nuclear family, extended family, or that are unrelated to the household head. Educational attainment was measured using a variable from the IPUMS which reports the individual’s highest grade or year of college attained. Unfortunately, this variable it is not detailed enough to distinguish between completion of a degree and years in school. This variable was further collapsed to create the variable **education,** which classifies the individual’s highest grade/year of education and includes the following categories: none or only elementary, middle school, high school, and college.

\(^{10}\) The variable Marital Status did not include a separate category for cohabitating couples.
Immigration-related characteristics. This sample is restricted to individuals born in Mexico. The variable citizenship indicates if the respondent is a naturalized citizen, or not a citizen. English language ability, speakeng, was measured on an ordinal scale with six categories ranging from “speaks only English” to “does not speak English” for the spatial analysis and dummy coded for the earnings analysis. The length of residence in the United States was measured using the categorical variable, yrsusa2, from the IPUMS data. This variable includes five categories, 0-5 years, 6-10 years, 11-15 years, 16-20 years, and 21 or more years of residence in the United States. This variable was further collapsed into three categories which include recent immigrants (less than 10 years), intermediate immigrants (11-20 years), and long-term immigrants (21 years or more). The recent migration status of the individual is captured in two variables, migration status and previous residence. Migration status indicates if the individual was living in the same house or had moved in the last five or one years. The Previous residence variable indicates if those that moved were living in California or Texas, one of the Other States, or were living abroad.

Economic characteristics. Income was measured using total personal income and all years were adjusted to 2007 dollars using the Current Price Index (CPI). A six category ordinal variable, income, was created which ranges from less than $5,000 to more than $25,000. While this range of categories might seem low for income, it reflects the distribution of earnings for this population. Earnings were measured using total annual income from earnings and adjusted to 2007 dollars. Weekly and hourly earnings were derived from this earnings variable by dividing the total annual earnings by the

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11 The migration variables in the Decennial Censuses focus on a change in residence in the previous five years while the American Community Survey (ACS) focuses on a change in residence in just the last year.
number of weeks worked in a year (weekly wages) and then by dividing this by the usual hours worked per week (hourly wage).

Poverty Characteristics. Poverty is a family-level variable that represents the family’s total income as percentage of the official poverty line. This variable not only reports the prevalence but also the depth of poverty and values from the variable poverty were collapsed to create the variable poverty ratio which identifies if the family’s income was 1) less than half of the official poverty line, 2) between 50% and 100% of the poverty line, 3) 100% to 150% percent of the poverty line 4) 150% to 200% of the poverty line or 5) more than 200% of the poverty line. The variable welfare is a dichotomous variable that indicates whether the farmworker has received any Public Assistance income. Public Assistance income consists of federal and state Supplemental Security Income (SSI) payments, Aid to Families with Dependent Children (AFDC), and General Assistance (GA).

Work Characteristics. Industry codes from the IPUMS data allow farmworkers to be further categorized into crop or livestock workers. The variable crop is a dichotomous variable that indicated the type of agricultural production in which the farmworker is employed. Another work related characteristic used in these analyses is the number of weeks worked per year. This variable—weeks worked—captures the differences between seasonal farmworkers and workers with more permanent positions.

Census of Agriculture

The National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture conducts the Census of Agriculture every five years to provide a detailed
inventory of households and firms engaged in food and fiber production in the United States. The Census of Agriculture collects data on the structure of the agricultural sector—including hired farm labor—aggregated to the national, state, and county levels. The Census of Agriculture defines a farm as “any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year (U.S. Department of Agriculture 2009a). The Census of Agriculture is a complete enumeration of all such enterprises. Although the definition of a “farm” has changed several times since the Census of Agriculture was first conducted in 1850, the current definition has been in use since 1974 making comparisons between the 2002 and 2007 censuses valid. Beginning with the 2002 census, the National Agricultural Statistics Service (NASS) adjusted the final national, state, and county estimates for coverage error. This adjustment increases the number of small-scale farms in the final statistics. However, this now makes comparisons between the 2002 and 2007 censuses and earlier censuses problematic.

The Census of Agriculture contains detailed statistics on several dimensions of hired farm labor including total hired labor, seasonal labor, and migrant labor. Total hired labor includes all types of labor (long-term, seasonal, migrant) and can be calculated using the number of farms with hired labor or the number of farmworkers in each geographic area. Seasonal farm labor is derived from the number of farms with farmworkers that are employed only 150 days or less, which is often used to approximate seasonal labor (Martin 2003b). Finally, beginning in 2002, the Census of Agriculture included the number of farms employing migrant workers. Migrant workers are defined
as a farmworker whose “employment required travel that prevented his/her return to their usual place of residence the same day” (U.S. Department of Agriculture 2009a).

The Census of Agriculture also contains data on the basic structure of agriculture in each county. The number of farms, size of farms, types of commodities produced, average sales, principal occupation of operators, average age of operators, and type of ownership are indicators of the structure of agriculture. Chapter 2 chronicled the dramatic changes in the farm sector in the United States since the 1950s. The process of agricultural restructuring is operationalized as changes in these structural indicators over time.

**Methods**

This research is made up of three separate analyses, the findings of which will be presented in chapters 4-6. The first analysis focuses on changes in the geographic distribution of Mexican-born farmworkers in the United States from 1980 to 2007, focusing on differences in demographic and immigration-related, and poverty characteristics of farmworkers living in new agricultural destinations and those in traditional destinations. The second analysis models changes in the earnings of Mexican-born farmworkers over time by destination type. The final analysis uses county-level data to measure the relationship between agricultural restructuring and the demand for hired farm labor.
Changing Geographic Distribution

The goal of this research is to highlight shifts in the spatial distribution of Mexican-born farmworkers in the United States, compare the demographic and immigration-related characteristics of migrants in traditional and new destinations, and show how the agricultural restructuring in new agricultural destination states is increasing the demand for hired labor in those states. To accomplish this, I first compare the proportion of Mexican-born farmworkers living in each state for the period 1980-2007. The degree to which Mexican-born farmworkers are spatially clustered is measured using Theil’s (1972) entropy index:

\[
E = \sum_{i=1}^{n} p_i \log(p_i) \times \frac{1}{\log(n)} \times 100
\]  

where \( n \) is the number of geographic units (states), and \( p_i \) is the proportion of farmworkers in that unit. The index ranges from 0-100 with low scores indicating that observations are concentrated within a few geographic units and a high scores indicating that observations are equally dispersed across units.

The second stage of this analysis is to compare the demographic and immigration-related characteristics of Mexican-born farmworkers across different destination types. Destination types are defined as “traditional” for farmworkers living in California and Texas and “new destination” for farmworkers in the other states. Farm operators in California and Texas were the main employers of Mexican-born farmworkers during the Bracero Period establishing these two states as traditional agricultural settlement areas.
(Martin, Fix, and Taylor 2006; Massey, Durand, and Malone 2002). The demographic composition was measured using age, sex, marital status, and education level. Immigration-related characteristics include citizenship status, ability to speak English, and length of residence in the United States. Poverty related characteristics include the poverty rate, poverty ratio, and the receipt of Public Assistance income.

**Changing Earnings Inequalities**

The purpose of this analysis is to describe and explain differences in the economic well-being of Mexican-born farmworkers living in traditional settlement states and those in new destination states. The main variables of interest in this analysis are the destination type and log hourly wages of Mexican-born farmworkers. Destination type was determined using the individual’s state of residence. Although a more refined geography would have made the classification of destination type more precise, the individual level samples from the PUMS and ACS restrict identifiers for smaller geographies. An individual’s hourly wages were calculated by dividing the total annual income from wages and salaries earned in the previous year by the product of weeks worked and usual hours worked per week in that year. In order to eliminate cases with unrealistic values on hourly earnings, I restricted the sample to people who usually worked 35 hours or more per week and had worked more than 12 weeks the previous year.

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12 While the IPUMS data do include a smaller geography (Public Use Microdata Areas or PUMAs), the boundaries for these geographies change over time and so could not be used in this analysis.

13 This cut-off was used because a sizable proportion of individuals in the sample reported working as few as 12 weeks out of the year, not surprising given the seasonal nature of farm work.
year. In addition, I take the natural log of hourly earnings to normalize the distribution of
the variable.

There are four stages of this analysis. The first is a descriptive analysis of the
economic and work related characteristics of Mexican-born farmworkers by destination
type from 1980-2007. Second, I use multivariate regression models to estimate the
relationship between the log hourly earnings and destination type while controlling for
demographic, immigration-related and work characteristics. The next part of the analysis
uses regression decomposition to quantify the compositional and structural components
of the change of log hourly earnings by destination type using the Blinder-Oaxaca
decomposition method (Blinder 1973; Oaxaca 1973).

**Descriptive analysis**

The first stage of this analysis will be to highlight patterns in demographic,
immigration-related, economic, and work characteristics of Mexican-born farmworkers
by destination type over time. Destination type is again defined as “traditional” for
farmworkers living in California and Texas and “new” for those living in other states.
The mean differences in demographic composition, immigration-related characteristics,
and work characteristics between farmworkers in California and Texas and those in Other
States will be compared over time.

**Multivariate analysis**

The second stage of this analysis uses multivariate regression to model changes in
the earnings inequalities of Mexican-born farmworkers by destination type. Specifically,
I use Ordinary Least Squares (OLS) regression to estimate log hourly earnings while controlling for destination type and demographic, education, immigration-related, and work characteristics. OLS regression is a statistical method used to measure the linear relationship between several independent variables and a continuous dependent variable concurrently. OLS regression equations obtain estimates of the coefficients that minimize the error sum of squares (Knoke, Bohrnstedt, and Mee 2002).

To account for the possibility that the relationship between log wages and destination type might be different from year to year, I use interaction effects between year and destination type in the OLS models. Interaction effects are used in multivariate analysis when the effects of the independent variable on the dependent variable are nonadditive, meaning that they differ depending on the value of the independent variable (Jaccard and Turrisi 2003). By including interaction terms between the type of residence and year, I am able to model the changes in earnings inequalities over time.

**Decomposition analysis**

The purpose of this analysis is to explain changes in the earnings of Mexican-born farmworkers over time. Because there is not longitudinal panel data for this population, I use cross-sectional data for several time periods. Methodologically, assessing the source of change in this type of research design can be problematic (Firebaugh 1997). For instance, it can be unclear if the earnings of Mexican-born farmworkers have changed because of changes in the hired farm labor market or if they are due to changes in the composition of the population. To overcome the limitations of analyzing repeated cross-
sectional studies, I use decomposition regression analysis to assess the sources of change in the earnings of farmworkers.

Decomposition is a method of disaggregating total change in the dependent variable into the parts resulting from changes in the structure of the outcome variable (in this case log hourly earnings) and the composition of the population (Firebaugh 1997). The Blinder-Oaxaca decomposition method is shown in Eq. (2)

\[
\bar{Y}_{(t+1)} - \bar{Y}_t = \sum_{k=1}^{K} b_{k,t} \left( \bar{x}_{k,(t+1)} - \bar{x}_{k,t} \right) + \sum_{k=1}^{K} \left( b_{k,(t+1)} - b_{k,t} \right) \bar{x}_{k,(t+1)}
\]

(2)

where the change in value of \( Y \) from time \( t \) to \( t + 1 \) is decomposed into two parts, the first term which represents change in population composition and the second term which in this case represents change in the returns to workers’ characteristics (McLaughlin and Perman 1991).

**Agricultural Restructuring and the Demand for Labor**

The purpose of this analysis is to measure the relationship between the demand for hired labor and agricultural restructuring. The demand for total hired farm labor is measured as the percentage of farms with hired labor in each county and is the main dependent variable in this analysis. The percentage of farms with seasonal labor and migrant labor will also be modeled. The independent variables represent different dimensions of agricultural restructuring, including the percentage of large sales farms, the percentage of large dairy farms, the percentage of principal operator farms, the average
age of operators, and the percentage corporately owned farms. The first stage of this analysis will be to present descriptive statistics of the dependent and independent variables for specific new agricultural destinations.

**Exploratory Spatial Data Analysis**

Because counties are not geographically independent from one another, it is necessary to account for spatial autocorrelation between observations (White 2008). Spatial autocorrelation occurs when geographic units that are proximate to one another share similar values on a given variable (Anselin 1988; White 2008). After calculating aspatial descriptive statistics, the next step will be to explore spatial patterns in the demand for hired farm labor using the Geographic Information System (GIS) software ArcGIS and spatial analysis software GeoDa™. GeoDa™ is an open-source computer program containing various techniques for assessing spatial autocorrelation in areal data (Anselin 2003). Among the different statistics produced through Exploratory Spatial Data Analysis (ESDA) is Moran’s I which is a global indicator of spatial autocorrelation. The Moran’s I statistic is a spatially-weighted correlation coefficient (Moran 1950). The value of Moran’s I typically ranges from -1 to 1, where a positive value indicates that areal units that are spatially close to one another have similar values while a negative value means that areal units that are spatially close to one another have different values.

In addition to the Moran’s I which is a global indicator of spatial autocorrelation, local indicators of spatial association (LISA) are used to identify spatial clusters within the total hired labor, seasonal labor, and migrant labor variables. The LISA statistic identifies local patterns of spatial structure or spatial clusters within a given variable (Anselin 1995). LISA analysis helps to identify outliers in the global indicators of
spatial autocorrelation or to identify geographic “hotspots” or clusters of the variable. LISA produces four mutually exclusive clustering patterns: high-high, low-low, low-high, and high-low. The first two groups indicate that geographic units have similar values to neighboring units while the last groups are outliers. By identifying spatial autocorrelation and clustering in the data, the exploratory spatial data analysis (ESDA) outlined above provides further justification for using explanatory spatial modeling (ESM).

**Multivariate Regression Analysis**

The final stage of this analysis is to model the relationship between changes in the demand for hired farm labor and changes in the structure of agriculture using first-difference regression models. First-difference regression analysis is a longstanding approach to analyzing change in panel data between two or more time periods where the change, or difference, in the values of the variables between time periods are modeled (Anderson and Hsiao 1981; Arellano and Bond 1991; Blundell and Bonds 1998; Harvey 1980; Holtzeakin, Newey, and Rosen 1988; Hsiao 2003; Lichter, McLaughlin, and Ribar 1997). An advantage of using first-difference regression models is that this approach has the benefit of canceling out unobserved heterogeneity in the regression model when all of the variables are differenced. This happens because the unobserved heterogeneity is differenced out, assuming that the unobserved effects are the same for both time periods (a first-difference regression model with only two time periods is analogous to a fixed effects model). While there are limitations in modeling longitudinal data to first-
difference regressions, this approach is a powerful way to analyze the change in panel data over time (Blundell and Bonds 1998).

In these models, the dependent variable is the difference between the percentage of farms with hired labor in 2007 and 1997. The independent variables have also been differenced and reflect different dimensions of agricultural restructuring. Three separate first-difference regression models are estimated. The first includes all counties in the United States, the second includes only counties in California and Texas, and the final model is limited to counties from Other States. The purpose of this modeling strategy is to reveal differences in the ways that agricultural restructuring is related to the changes in the demand for hired farm labor by destination types. The models are weighted by the number of farms in each county to account for variation in the relative importance of farm structure across counties in the United States.

**Conclusion**

The analyses outlined above are focused on three broad research questions 1) what changes have there been in the spatial distribution of Mexican-born farmworkers in the United States, 2) how is agricultural restructuring affecting the demand for hired farm labor, and 3) how does living in a new agricultural destination impact farmworkers’ economic well-being. This chapter reviewed the different sources of data that are commonly used to study hired farm labor and explained why the IPUMS data are appropriate for this analysis. Descriptions of the specific variables and measures that are
used in the analyses were provided, as were the strategies that will be used for the actual analyses. The following chapters report the findings and implications for these analyses.
Chapter 4

The Changing Geographic Distribution of Mexican-born Farmworkers in the United States

Mexican-born immigrants in the United States have historically been geographically concentrated in a few select “gateway” cities in California, Illinois, and throughout the Southwest, but in recent decades the number living outside traditional gateway cities in new destinations has increased dramatically (Durand, Massey, and Charvet 2000; Singer, Hardwick, and Brettell 2008). This research focuses on one specific subset of Mexican-born immigrants living in new destinations, farmworkers. Agricultural labor has historically been another type of gateway for Mexican-born immigrants as many begin their U.S. employment experience as hired farm laborers (Martin 2002). While the percentage of Mexican-born immigrants working in agriculture relative to other industries has declined in recent years, there are currently more Mexican-born immigrants working in agriculture than at any time during the 20th Century (see Chapter 1).

This chapter situates farmworkers within broader patterns of Mexican migration by analyzing changes in the geographic distribution of Mexican-born immigrants working in agriculture. This chapter addresses research question 1 which asks: over time, how has the geographic distribution of Mexican-born farmworkers in the United States changed? There are several mechanisms that could be associated with changes in the geographic distribution of this population. First, changes in the geographic distribution of all Mexican-born immigrants could result in a shift in the geography of Mexican-born
farmworkers, especially since a disproportionately high number of Mexican-born immigrants work in agriculture. Second, restructuring in the agricultural sector could be increasing the demand for low-wage labor outside of traditional settlement areas, with these jobs being filled by Mexican-born immigrants. Although it would be closely related to agricultural restructuring in new destinations, the recruitment of workers by labor contractors would be another mechanism whereby the share of Mexican-born farmworkers in new destinations is changing (Krissman 2000). Finally, Mexican-born workers already living in new destinations could be switching to farm labor, thereby increasing the number of Mexican-born farmworkers in that area without necessarily being new arrivals to that area.

This analysis also addresses the research question: what differences are there in the demographic and socioeconomic composition of Mexican-born farmworkers living in traditional settlement states (California and Texas) and those in new destination states? How do these differences change over time? Given that the social and economic costs for migration are higher for the earliest arrivals to an area, I expect that Mexican-born farmworkers in new destinations will have more selective demographic and immigration-related characteristics than immigrants in traditional settlement states, but as the population in new destinations increases, these differences will decline.

Data for this analysis come from the 1980, 1990, and 2000 Public Use Microdata Samples (PUMS) and the 2005-2007 American Community Survey (ACS). A full description of the data and measures for this analysis can be found in Chapter 3. This chapter is divided into three sections. The first section focuses on changes in the percentage of farmworkers by state over time. The next section compares the
demographic composition of Mexican-born farmworkers in traditional settlement states and those in new destinations. The immigration-related characteristics of farmworkers are then compared by destination type. The findings show that Mexican-born farmworkers have become less geographically concentrated over time and, while there are demographic and social differences between farmworkers by destination, these differences have declined over time.

**Geographic Distribution**

There has been a considerable shift in the geographic dispersion of Mexican farmworkers in the United States. Table 1 reports the distribution of Mexican origin farmworkers by selected states from 1980-2006. In 1980, Mexican origin farmworkers in the U.S. were clustered in a relatively small number of states along the West Coast and in the Southwest. In that year, California and Texas accounted for over 80 percent of Mexican farmworkers, 65.5 and 14.8 percent, respectively, and over 90 percent of all Mexican farmworkers in the U.S. lived in just five states (California, Texas, Washington, Arizona, and Florida). With the exception of Illinois, Idaho, and Florida all of these states were located in the Southwest and along the West Coast. In that year, the diversity index—which ranges from 0-100 with high scores indicating that values are evenly dispersed between units—was 34.2, meaning that the Mexican-born farmworker population was geographically clustered in just a few states (Theil 1972).

From 1980-1990 the total number of Mexican-born farmworkers in the United States more than doubled, in part, because of amnesty provisions for seasonal farmworkers in IRCA that spurred the migration of over one million immigrants from
Table 4.1 Ten States with the Highest Percentage of Mexican-Born Farmworkers 1980-2007.

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<td>Top Ten States</td>
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<td>Diversity Index</td>
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<td>40.5</td>
<td>50.6</td>
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¹Source: 1% and 5% Public Use Census Microdata
²Source: Pooled 2005, 2006, and 2007 American Community Survey (ACS)
Mexico (Martin, Fix, and Taylor 2006). However, there were only slight changes in the spatial distribution of Mexican-born farmworkers. California and Texas were still the destination states for 73.6 percent of all farmworkers and the five states with the highest share remained the same, but now accounted for 88.1 percent. By 1990, Georgia had become a destination for Mexican-born farmworkers. The diversity index increased to 40.5 suggesting that the overall population became more geographically dispersed.

The greatest changes in the spatial distribution of Mexican-born farmworkers happened during the 1990s. From 1990-2000, the proportion living in California and Texas declined to 62.8 percent. Again there was a drop in the percentage of Mexican-born farmworkers living along the West Coast and in the Southwest. Georgia was again a destination state and North Carolina emerged as a destination state. The diversity index increased to 50.6 signaling greater spatial dispersion than in 1980 or 1990.

By 2007, the share living in California and Texas had declined to 55.4 percent. In fact, Washington became the state with the second highest percentage of Mexican-born farmworkers during this time period. The five states with the largest percentages were now California, Washington, Texas, Florida, and Oregon and accounted for 75.1 percent. Georgia and North Carolina continued to be destination states as well as Michigan. In addition, there were also increases in the share of Mexican-born farmworkers living in Pennsylvania and Wisconsin but these states were not among the top 10 overall destination states and so are not included in Table 1. The diversity index increased to 56.4. Mexican-born farmworkers in the United States continue to be a very spatially clustered population; however, there has been considerable growth in the number of Mexican-born farmworkers living in new destinations.
Figure 4.1 illustrates the geographic shift of the Mexican-born population working in agriculture. These maps represent the percentage of the total Mexican-born farmworkers population living in each state in 1980, 1990, 2000, and 2005-07. From the 1980 map, it is clear that the population of Mexican-born farmworkers was clustered along the West Coast, Southwest, and Florida. While there were significant shifts in the geographic distribution of this population between 1980 and 1990, the largest increases in the percentage of the total Mexican-born farmworker population were confined to states that already had large shares of farmworkers such as Washington and Florida. From 1990 to 2000, however, the maps show that states in the Mountain West, South, and Midwest became destination states. The percentage of Mexican-born farmworkers living in traditional settlement states continued to decline as is indicated by the map for 2005-07 in Figure 4.1. Although Mexican-born farmworkers continue to settle in a select set of states (Figure 4.1), there have been considerable shifts in the geographic distribution of this population.

The intent of this section of the analysis was to highlight changes in the spatial distribution of Mexican farmworkers in the United States by state of residence and by year. The results clearly answer the first research question that the percentage of Mexican farmworkers living in traditional settlement states, most notably California and Texas, has been declining as migrants are settling in new agricultural destination states. This has important implications for both further research and policy. At this point, more research is needed into the characteristics of Mexican-born farmworkers in new destinations. From a policy standpoint, the increasing number of Mexican-born farmworkers in new destinations calls into question the continued need for the H-2A worker program which is
Figure 4.1 Distribution of Mexican-born Farmworkers by State, 1980-2007
designed to fill farm labor shortages in areas where the supply of hired farm labor is scarce. A more nuanced discussion of the policy implications for these findings is found in Chapter 7. The remaining sections of this chapter address the characteristics of Mexican-born farmworkers in new destinations.

**Demographic Composition**

According to the theory of cumulative causation, the first migrants to an area are usually more socially and economically selective than later migrants (Massey et al. 1993). The second stage of the analysis tests if this theory is applicable to Mexican-born farmworkers by comparing and contrasting the demographic composition of the Mexican-born farmworker population living in traditional agricultural settlement states and those living in new destination states. The demographic characteristics of Mexican farmworkers living in California and Texas and those in other states are reported in Table 4.2.

As noted above, over 80 percent of Mexican-born farmworkers lived in California and Texas in 1980. At that time, farmworkers in other states were more likely to be male, were younger, less likely to be married, were less likely to be living with a relative, and had slightly higher levels of education than those living in California and Texas. The demographic differences between Mexican-born farmworkers living in new destination states and those in traditional settlement states can be explained by theory or cumulative causation. On average, farmworkers in new destinations are less attached to either their origin in Mexico or traditional immigrant settlement states (younger, not married, living in unrelated households). Also, given the higher levels of education, these initial migrants
would have been more attractive to employers and had greater opportunities for employment in new destinations, even in agriculture, which is a low-skilled industry.

Many of these differences in the demographic composition of Mexican-born farmworkers by destination type increased between 1980 and 1990 despite a decline in the geographic concentration of this population. In 1990, the percentage of farmworkers that were male increased across all destination types with the larger gains in new destinations. While farmworkers in new destination states were again younger than those in California and Texas, the number of workers age 24 or less (the modal category in 1980) decreased in both areas, as the new modal age category became 25-34. The share of never married Mexican-born farmworkers also increased in both California and Texas and Other States. The percentage of Mexican-born farmworkers living with nuclear or extended family remained considerably higher in California and Texas. The only area where the differences by destination did not increase was in educational attainment, which increased for all Mexican-born farmworkers. One explanation for these findings is that Mexican immigrants with higher human capital, who would have likely worked in other industries, began working in agriculture in order to receive amnesty under the Special Agricultural Workers (SAW) program, which was part of the Immigration Reform and Control Act (IRCA) of 1986.

From 1990-2000, there were sizeable changes in the sex, age, marital status, living arrangement, and educational attainment characteristics of Mexican farmworkers both in general and by state of residence. In 2000, a smaller percentage of farmworkers were male in both California and Texas and in other states (Table 2.). While the modal age category remained 25-34, there was an increase in the number of Mexican
Table 4.2 Demographic Characteristics of Mexican-Born Farmworkers in the U.S. 1980-2007 (percentages reported).

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>CA/TX</td>
<td>Other States</td>
<td>CA/TX</td>
<td>Other States</td>
<td>CA/TX</td>
</tr>
<tr>
<td>Percent of Total</td>
<td>80.3</td>
<td>19.7</td>
<td>73.6</td>
<td>26.4</td>
<td>62.8</td>
</tr>
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<td></td>
<td></td>
<td></td>
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<td>Other States</td>
<td></td>
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<tr>
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<td>20.7</td>
</tr>
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<td>25-34</td>
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<td>29.7</td>
<td>34.1</td>
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<td>29.2</td>
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<td>35-44</td>
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<td>19.3</td>
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<tr>
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<td>55 and older</td>
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<tr>
<td>Separated, Divorced,</td>
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<td>Relationship to household</td>
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<td>69.88</td>
<td>67.91</td>
<td>64.19</td>
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<td>Extended family</td>
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<td>7.85</td>
<td>18.09</td>
<td>11.91</td>
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<td>22.27</td>
<td>14.00</td>
<td>23.9</td>
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<td>Education</td>
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<td>17.3</td>
<td>14.8</td>
<td>18.6</td>
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<tr>
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<td>30.0</td>
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<td>21.9</td>
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<td>37.2</td>
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Table 4.2 Continued

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<th>Region</th>
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<th>Other States</th>
<th>1990 CA/TX</th>
<th>Other States</th>
<th>2000 CA/TX</th>
<th>Other States</th>
<th>2005-07 CA/TX</th>
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<tbody>
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</tr>
<tr>
<td></td>
<td>-</td>
<td>2.1</td>
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<td>3.2</td>
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<td>4.6</td>
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<td>5.0</td>
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<tr>
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<tr>
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<td>-</td>
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<td>6.8</td>
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<td></td>
<td>18.4</td>
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<td>28.4</td>
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<td></td>
<td>81.6</td>
<td>76.0</td>
<td>82.5</td>
<td>61.6</td>
<td>86.1</td>
<td>49.5</td>
<td>86.8</td>
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<td>11,262</td>
<td>4,256</td>
<td>14,667</td>
<td>8,736</td>
<td>6,590</td>
<td>4,861</td>
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</table>
farmworkers age 35-44 indicating that Mexican farmworkers might not be “aging out” of agricultural employment at the high rates previously predicted by other analyses (Kandel 2004; Martin 2002). Older Mexican-born immigrants working in agriculture might be indicative that agricultural employment is being used less as a stepping-stone to employment in other industries and more as a permanent economic strategy. These findings could also reflect the sheer magnitude of migration from Mexico during the 1990s, which brought immigrants from all ages, not just younger working-age immigrants, to the United States. Nevertheless, it is clear from these findings that the percentage of older Mexican-born immigrants that are working in agriculture has increased in recent decades.

A growing number of Mexican-born farmworkers in new destinations were single while the share of married and single remained constant in California and Texas. The percentage of immigrant farmworkers in Other States living with a nuclear family actually decreased between 1990 and 2000 while the share living with an extended family increased. This finding shows that extended family networks, in part, facilitated the shift in the geographic distribution of Mexican-born farmworkers to Other States. In 2000, educational attainment increased in both California and Texas and in the other states. The percentage of farmworkers with only an elementary level education declined from 23.8 to 14.2 percent in California and Texas and from 21.9 to 11.6 percent in other states. This was consistent with the overall tendency that farmworkers have higher educational attainment outside of California and Texas. These differences were again statistically significant.
By 2007, nearly half of all Mexican farmworkers were living in states other than California and Texas. While overall trends in the gender, age structure, marital status, living arrangements, and education attainment were similar to previous years, the differences between workers in California and Texas and other states were less apparent. From 2000-2007, there was a sharp increase in the number of female agricultural workers living outside of California and Texas. The percentage of farmworkers living in other states that were married increased while the share of farmworkers in California and Texas that were married declined. Similarly, the share of Mexican-born farmworkers in Other States living with nuclear family increased. That the percentage of female, married, and living with nuclear family is increasing in new destinations has important ramifications for the long-term geographic distribution of the Mexican-born farmworker population as these immigrants are more likely to become permanent residents in these communities.

Once again there was an increase in the later age intervals indicating that proportionately fewer Mexican-born farmworkers are aging-out of agricultural employment. This also indicates that many young Mexican-born immigrants are finding employment in other industries and therefore bypassing agriculture, which has traditionally been a gateway occupation. Although educational attainment was consistently higher in the other states, the differences in 2007 were much more pronounced. For example, 40.7 percent of Mexican farmworkers living in other states had some high school compared to 29.2 percent in California and Texas. While there were stark differences in the demographic composition of Mexican farmworkers living in California and Texas with those in new destination states in 1980, these differences
diminished over time as the farmworkers living in new destination states became less selective.

There has also been a geographic redistribution between regions outside the traditional Hispanic settlement areas (Table 4.2). In 1980, the majority of Mexican farmworkers living outside of California and Texas were in the West region (76.1%) while only 15 percent lived in the South, 6.9 percent in the Midwest, and 2.1 percent in the Northeast regions. In 2007, the regional distribution had shifted considerably as the percentage of farmworkers living in the West had declined to 49 percent while the share increased in the South (31%), Midwest (14.1%) and Northeast (5.9%). These changes in the regional distribution of Mexican-born farmworkers provide further indication that this population is becoming more geographically dispersed.

**Immigration-Related Characteristics**

While the preceding section focused on differences in the demographic composition of Mexican-born farmworkers in traditional settlement states and new destinations, this section looks at how the immigration-related characteristics of these two groups differ. Immigration-related characteristics—citizenship status, ability to speak English, length of residence in the United States, migration status, and recent residence—have significant impact on foreign-born workers’ employment opportunities and overall economic survival while in the United States. Other research has shown that immigrants in new destinations are different from those in more established gateways on these indicators. For instance, immigrants in new destinations are often more recent arrivals to the United States (Jensen 2006) and so would be less likely to be naturalized
citizens or speak English. Table 4.3 reports differences in the immigration-related characteristics of farmworkers living in California and Texas and other states. In 1980, Mexican-born farmworkers in other states were more likely to be a naturalized citizen, had the higher English language proficiency, were more recent arrivals to the United States, were less likely to have been living in the same house 5 years earlier, and were more likely to have relocated from other states or abroad if they had moved than those living in California and Texas.

From 1980-1990, the differences in citizenship status between the two groups had diminished as the proportion of naturalized citizens in other states declined. This change most likely came about because of the amnesty provisions within the Immigration Reform and Control Act (IRCA) of 1986, which allowed a large number of Mexican-born immigrants, many of whom had already been working in agriculture, to continue working in the United States without fear of deportation. There was also an increase in English language proficiency for both groups but more so for farmworkers in California and Texas. During the 1980s, the percentage of Mexican-born farmworkers that were recent immigrants declined in CA/TX. There was little change in the share of recent immigrants in Other States. The years of residence in the United States increased for farmworkers in CA/TX indicating that these immigrants remained working in agriculture and did not move on to other industries. One substantial change during this decade was the more than doubling of the percentage of Mexican-born farmworkers in California and Texas that remained in the same house indicating that these immigrants were settling in these states. While there was also an increase in share living in the same house in other states, the change was far less dramatic. Changes in the residence of movers from 5 years ago also
Table 4.3 Immigration-Related Characteristics of Mexican-Born Farmworkers in the U.S. 1980-2007 (percentages reported).

<table>
<thead>
<tr>
<th>Citizenship</th>
<th>1980 CA/TX Other States</th>
<th>1990 CA/TX Other States</th>
<th>2000 CA/TX Other States</th>
<th>2005-07 CA/TX Other States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naturalized Citizen</td>
<td>17.8 24.0</td>
<td>18.6 20.5</td>
<td>15.1 13.9</td>
<td>13.4 11.7</td>
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<tr>
<td>Not a Citizen</td>
<td>82.2 76.0</td>
<td>81.4 79.5</td>
<td>84.9 86.1</td>
<td>86.6 88.3</td>
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</table>

<table>
<thead>
<tr>
<th>English Language Ability</th>
<th>1980 CA/TX Other States</th>
<th>1990 CA/TX Other States</th>
<th>2000 CA/TX Other States</th>
<th>2005-07 CA/TX Other States</th>
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</thead>
<tbody>
<tr>
<td>Only English</td>
<td>1.3 1.9</td>
<td>4.6 3.7</td>
<td>7.6 5.7</td>
<td>2.5 2.7</td>
</tr>
<tr>
<td>Very well</td>
<td>7.8 12.5</td>
<td>13.2 17.4</td>
<td>8.0 11.8</td>
<td>7.2 10.4</td>
</tr>
<tr>
<td>Well</td>
<td>13.7 16.4</td>
<td>12.0 16.6</td>
<td>10.8 14.4</td>
<td>10.9 16.0</td>
</tr>
<tr>
<td>Not Well</td>
<td>32.4 31.0</td>
<td>31.6 33.8</td>
<td>27.7 33.9</td>
<td>29.5 36.7</td>
</tr>
<tr>
<td>Does not speak English</td>
<td>44.8 38.2</td>
<td>38.5 28.6</td>
<td>46.0 34.2</td>
<td>50.0 34.2</td>
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<th>Years in the United States</th>
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<th>1990 CA/TX Other States</th>
<th>2000 CA/TX Other States</th>
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<tr>
<td>0 to 5 years</td>
<td>34.0 40.1</td>
<td>27.8 38.0</td>
<td>24.0 37.5</td>
<td>20.2 30.0</td>
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<tr>
<td>6 to 10 years</td>
<td>24.3 24.6</td>
<td>22.6 23.3</td>
<td>19.0 22.3</td>
<td>17.9 22.9</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>14.2 11.8</td>
<td>18.0 17.0</td>
<td>18.9 16.9</td>
<td>14.1 15.3</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>11.8 8.6</td>
<td>14.6 10.3</td>
<td>13.4 10.2</td>
<td>14.9 13.8</td>
</tr>
<tr>
<td>21+ years</td>
<td>15.7 14.9</td>
<td>17.0 11.4</td>
<td>24.7 13.1</td>
<td>32.9 18.0</td>
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<table>
<thead>
<tr>
<th>Migration status</th>
<th>Residence 5 Years Ago</th>
<th>Residence 1 Year Ago</th>
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</thead>
<tbody>
<tr>
<td>Same House</td>
<td>17.3 14.1</td>
<td>39.8 23.7</td>
</tr>
<tr>
<td>Movers</td>
<td>82.7 85.9</td>
<td>60.2 76.3</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Residence 5(1) years ago of movers</th>
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<tbody>
<tr>
<td>CA/TX</td>
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<tr>
<td>22.6 5.5</td>
</tr>
<tr>
<td>Other States</td>
</tr>
<tr>
<td>62.3 76.2</td>
</tr>
<tr>
<td>Abroad</td>
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<tr>
<td>15.1 18.3</td>
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<table>
<thead>
<tr>
<th>(N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,085 1,495</td>
</tr>
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</table>
indicated that much of the movement in California and Texas came from farmworkers who already resided in these two states.

The most pronounced changes in immigration-related characteristics came during the 1990s as the percentage of Mexican-born farmworkers in new destinations began to increase substantially. For the first time, the percentage of farmworkers who were U.S. citizens was higher in California and Texas than in Other States. There are several explanations for this change. First, immigrants who received amnesty under IRCA in the 1980s would have become eligible for citizenship in the 1990s and given that the larger share of farmworkers lived in California and Texas at that time, this would have a greater impact on the percentage of farmworkers with citizenship status in those states. Another explanation is that while Mexican-born farmworkers in Other States were always more recent arrivals to the United States—and therefore less likely to be naturalized citizens—than farmworkers in California and Texas, the differences by destination increased during the 1990s.

Throughout the study period, there is a bifurcated pattern in the relationship between English language ability and destination type, which became more dramatic between 1990 and 2000. While the percentage of Mexican-born farmworkers that reported speaking either no English or only English was higher in CA/TX, the share that reported speaking English very well and well was higher in Other States. These differences in English language are not surprising given the greater concentration of Spanish-speaking co-ethnics in California and Texas than in parts of the United States. English language ability is more important for Mexican-born farmworkers living in Other
States where there are fewer employers, retail store clerks, and social service providers that speak Spanish.

During the 1990s, differences in the length of residence in the United States of Mexican-born farmworkers by destination increased. In 2000, as in other years, farmworkers in Other States were more recent arrivals with 37.5 percent having lived in the U.S. less than 5 years compared to 24.0 percent of farmworkers in California and Texas. In that year, the percentage of long-term arrivals increased substantially in California and Texas while declining slightly in Other States. These findings suggest that the shift of the Mexican-born farmworker population from traditional settlement states to new destinations is largely the effect of more recent immigrants bypassing California and Texas and settling in Other States, a fact that is further evidenced in the migration status and residence 5 years ago of movers. Again, Mexican-born farmworkers living in Other States were more likely to have moved in the last five years. Of movers, farmworkers in Other States were less likely to come from California and Texas and were more likely have moved from other states or from abroad.

Between 2000 and 2007, the patterns in immigration-related characteristics and destination type that emerged in the 1990s continued. Overall, there was a decline in the share of Mexican-born farmworkers who are naturalized citizens, which affected both destination types equally, but farmworkers in California and Texas were more likely to be naturalized citizens. There was a substantial increase in the percentage of Mexican-born farmworkers that do not speak English, especially in California and Texas. Also, differences in the length of residence in the U.S. by destination type declined from 2000 to 2007 as the share of new arrivals in both areas decreased. As for migration status and
previous residence, farmworkers in Other States are more likely to have moved and also more likely to have moved from abroad, however, these results are not comparable to the previous years because they represent the residence one year ago as compared to five years ago in 1980, 1990, and 2000. In recent years, there has been a substantial increase in the total number of Mexican-born immigrants to the United States and the relative number of those immigrants working in agriculture has been declining. Most likely, those Mexican-born immigrants that are naturalized citizens, speak English, and have resided in the U.S. for longer work in industries where the returns for these skills and experience are greater.

Comparing immigration-related characteristics across destinations provides further indication of the selectivity of migrants in each destination and broadens our understanding of the changing geography of Mexican-born farmworkers by helping to identify which types of migrants are most likely to settle in new destinations in different decades. Clearly there are differences in the immigration-related characteristics of Mexican-born farmworkers living in traditional settlement states and those in new agricultural destinations. These differences were most pronounced in 1980 but have diminished, or in some cases reversed, over time. The extent to which the structure of agriculture in new destinations has created demand for low-skilled labor, which would have implications of the selectivity of the migrants filling that demand, is addressed in Chapter 6, which focuses on agricultural restructuring and the demand for hired labor in new destinations.
Poverty and Welfare

The earnings of immigrants are typically less than those of native-born workers, especially when they first arrive in the United States. Over time, however, the earnings of some immigrants will increase as they become more integrated into the U.S. economy. This phenomenon, called income mobility, is an important indication of economic assimilation (Borjas 1985; Valdez 2006). In an attempt to relate spatial assimilation with economic assimilation, I look at differences in income and poverty between Mexican farmworkers living in California and Texas and those in other states (Table 4.4). In 1980, the total personal incomes of farmworkers (measured in 2007 dollars) living in new agricultural destinations were considerably lower than those workers living in California and Texas. Nearly one-third of workers in other states reported a total personal income less than $5,000 compared to 26 percent of those in California and Texas. In every other income category, the percentage of workers receiving that income was greater in California and Texas. In 1990, incomes were again generally higher in California and Texas. During the 1990s, however, incomes had become higher in the other states. In 2000, the percentage of farmworkers with incomes between $15,000 and $25,000 and over $25,000 increased dramatically and were greater in other states. These trends toward higher incomes in new agricultural destinations continued in 2006.

Given the relative growth in income for Mexican farmworkers living in new agricultural destinations, it is not surprising that trends in poverty in these states have declined over time. In 1980, nearly half of all Mexican-born farmworkers in Other States had incomes below the poverty line compared to 34.6 percent of those living in CA/TX. From 1980-1990, there was a slight increase in poverty rates in both destinations which is

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CA/TX Other States</td>
<td>CA/TX Other States</td>
<td>CA/TX Other States</td>
<td>CA/TX Other States</td>
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<td>24.8</td>
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</tr>
<tr>
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<td>$10,000 - $14,999</td>
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<td>20.3</td>
</tr>
<tr>
<td>$15,000 - $25,000</td>
<td>25.4</td>
<td>24.5</td>
<td>24.1</td>
<td>31.4</td>
</tr>
<tr>
<td>More than $25,000</td>
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<td>8.0</td>
<td>9.4</td>
<td>16.5</td>
</tr>
<tr>
<td><strong>Poverty Rate</strong></td>
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<tr>
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<td>36.5</td>
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<td>29.1</td>
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<tr>
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<td>12.3</td>
<td>9.3</td>
</tr>
<tr>
<td>1.0 - 1.49</td>
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<tr>
<td>1.5 - 2.0</td>
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<td>23.4</td>
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<td>17.1</td>
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<td><strong>Public Assistance receipt</strong></td>
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<td>4.8</td>
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<td>2.3</td>
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<td>(N)</td>
<td>6,085</td>
<td>11,262</td>
<td>14,667</td>
<td>6,590</td>
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</tbody>
</table>

(N) = number of observations.
consistent with the economic recession of the 1980s. By 2000, poverty rates declined dramatically in Other States while remaining relatively the same in CA/TX. From 2000-2007, the percentage of Mexican-born farmworkers living in poverty continued to decline. Throughout the study period, poverty rates were higher in Other States than in CA/TX; however, these differences became less pronounced over time. More dramatic, however, were declines in the depth of poverty for farmworkers living in new agricultural destinations. In 1980, over 25 percent of Mexican-born farmworkers had yearly incomes less than half of the poverty line compared to only 16 percent of farmworkers in California and Texas. There was relatively little change in the high poverty rates of Mexican farmworkers, especially among those living outside of California and Texas, from 1980-1990. However, during the 1990s, there were dramatic declines in the percentage of farmworkers in new agricultural destinations earning less than half of the poverty line. By 2000, the percentage of Mexican farmworkers in this category had declined to 14.3 percent and by 2007 was down to only 12.5 percent, half of what it was in 1980. Mexican-born farmworkers are among the most impoverished workers in the United States. While the depth of poverty has been greatest among Mexican-born farmworkers living in new settlement areas, the percentage of farmworkers whose income is half of the poverty line has declined over time.

Despite high rates of poverty, a very small share of Mexican-born farmworkers receive Public Assistance income (Table 4.4). Overall, Public Assistance receipt increased from 1980 to 2000 but declined in 2005-2007. In 1980, roughly 4 percent of all Mexican-born farmworkers in CA/TX received Public Assistance compared to only 1.8 percent in Other States. These differences persisted throughout the study period.
Mexican-born farmworkers having such low rates of welfare receipt is not surprising especially given that this population is overwhelmingly male, of working-age, and without U.S. citizenship. However, the consistent differences in welfare receipt across CA/TX and Other States indicates that farmworkers in new destinations have more difficulty accessing Public Assistance programs despite their greater need.

Poverty rates for Mexican-born farmworkers declined from 1980 to 2007 and the greatest of these declines were among those with the greatest depth of poverty. This indicates that agricultural labor has become a somewhat more viable economic strategy for some immigrants. Also, given that increases in incomes and declines in poverty rates were greatest in new destination states, these findings suggest that if a farmworker were to have moved from California and Texas to another state, this could easily be considered spatial assimilation. The relationship between destination type and earnings will be explored in greater detail in Chapter 5.

**Discussion and Conclusion**

This analysis suggests that the spatial distribution of Mexican-born farmworkers in the United States is changing as migrants are increasingly settling in new agricultural destination states such as Washington, Oregon, Georgia, North Carolina, and Wisconsin. Also, the demographic composition, immigration-related characteristics, and income and poverty conditions of those migrants living in these new destinations is considerably different from Mexican farmworkers living in traditional states. In some ways, farmworkers in new destination states in the 1980s were more selective than farmworkers in California and Texas—higher education, more likely to be a naturalized citizen, greater
English language ability. However, as the number of farmworkers in new destinations increased during the 1990s, the demographic composition and immigration-related characteristics between the two groups converged.

These findings support the theory of cumulative causation outlined in Chapter 2 in two important ways. First, this theory posits that as migration streams are first established, the initial migrants will be more socially and economically selective than migrants that come when the stream is more established. From the results above it is clear that as the proportion of Mexican-born farmworkers living in new destinations increased throughout the study period, this group as a whole became less socially and economically selective. Second, the theory of cumulative causation posits that migration streams become cumulative over time because the costs of migration for later arrivals are lower because they are able to use their social networks to gain information and resources from people who have migrated earlier (Massey 1990). This aspect of cumulative causation is clearly exhibited in the changes to the living arrangements of Mexican-born farmworkers living in other states over time.

The changes in the spatial distribution of Mexican farmworkers have also impacted the incomes and poverty levels. Whereas in 1980 and 1990, Mexican farmworkers in new destination states had total incomes less than those living in California and Texas, by 2000 farmworkers in new destinations had caught up, and by 2006, their total incomes had surpassed those living in California and Texas. Subsequently, the greater depth of poverty experienced by Mexican farmworkers in new agricultural destinations has also diminished. These findings are consistent with other research showing that poverty rates among Mexican immigrants are lower in rural areas
outside of traditional gateway cities (Crowley, Lichter, and Qian 2006), indicating a close relationship between spatial and economic mobility.

There are a number of factors contributing to these changes in the spatial distribution of Mexican farmworkers. The growth of farmworkers in new destination states directly followed the 1986 Immigration Reform and Control Act (IRCA), which provided citizenship for over one million farmworkers under the Special Agricultural Workers (SAW) program. While it has been argued that this new legal status simply facilitated the movement of farmworkers into other industries (Martin 2002), these results show sizable changes in the geographic distribution of farmworkers shortly after this legislation. Agricultural restructuring also increased the demand for low-wage workers in farm sectors that have not historically employed immigrant labor such as dairy farms in New York State (Maloney 2002), the apple orchards in Virginia (Gozdziak and Bump 2004), and tobacco farms in North Carolina (Quandt, Arcury, Early, Tapia, and Davis 2004). In addition, the vertical integration of food production and food processing have created opportunities for settlement in new rural destinations (Kandel and Parrado 2005). Continued restructuring in the agricultural sector will undoubtedly have impacts on the dynamics of Mexican migration.
Chapter 5

Changing Earnings Inequalities of Mexican-Born Farmworkers

Immigrant farmworkers have long been one of the most socially and economically marginalized populations in the United States (Griffith and Kissam 1995; Martin 2003b; Martin, Fix, and Taylor 2006). While there is a large body of literature that focuses on the low socioeconomic status of immigrant farmworkers (see Chapter 2), this literature has not addressed the impact of living in a new destination on wages. This chapter addresses that omission by focusing on the following research questions. First, do the earnings of Mexican-born farmworkers differ between new destination and traditional settlement areas? This research question theoretically tests the economic assumption that individuals are motivated to migrate by earnings differentials between regions. If wages are higher for farmworkers in new destinations, then that will explain the increase in Mexican-born immigrants working in these states.

The second research question addressed in this chapter asks how have differences in earnings by these destination types changed over time? Here I expect that earnings will change over time for Mexican-born farmworkers in new destinations for several reasons. First, agricultural restructuring in new destinations could be changing the skill requirements for labor in some commodities thereby increasing the demand for low-skilled workers. Second, earnings could also be changing over time as the composition of the population of Mexican-born farmworkers in new destinations changes. As
migration streams become more established, typically the social and economic selectivity of migrants decreases and as the results in Chapter 4 show, Mexican-born farmworkers in new destinations have become more demographically and socially similar to their counterparts in traditional settlement states. For this reason earnings could be declining. It could also be the case that changes in the composition are related to increases in earnings. Finally, changes in the returns to human capital—the ways in which the individual characteristics of Mexican-born farmworkers are related to earnings—should also impact earnings over time.

The results presented in Chapter 4 indicated that the percentage of Mexican-born farmworkers living in new destination states has increased substantially since 1980 and that there are differences in the demographic and social composition of farmworkers across destinations. As mentioned above, this chapter focuses on differences in earnings for Mexican-born farmworkers by destination, how those differences have changed over time, and what specific factors account for changes in earnings. The chapter begins with a brief overview of the descriptive analysis of the demographic, social, and economic characteristics of Mexican-born farmworkers by destination type presented in Chapter 4. The next section uses multivariate regression analysis to model the effect of living in a new destination state on the on wages of Mexican-born farmworkers while controlling for demographic, social, and economic factors. The final part of this chapter uses regression decomposition analysis to help explain the change in earnings inequalities over time by separating out the change in earnings that is due to changes in the composition of the Mexican-born farmworker population from the change that is due to the returns to workers’ characteristics.
Descriptive Statistics

A detailed descriptive analysis of the demographic composition and immigration-related characteristics of Mexican-born farmworkers by destination type and year was presented in Chapter 4 and so will not be repeated here. In this section, I briefly summarize key differences by destination type and year in demographic composition and immigration-related characteristics and then provide a deeper analysis of the earnings and work variables that are included in the multivariate regression analysis below (Table 5.1).

Throughout the study period, there are consistent compositional differences between Mexican-born farmworkers by destination type. Demographically, Mexican-born farmworkers living in new destinations tend to be younger, are more often male, and are less likely to be married than those living in traditional destination states (Table 5.1). While these patterns are consistent over the study period, the differences by destination type become less pronounced as the proportion of Mexican-born farmworkers living in new destinations increases. Farmworkers in new destinations are less likely to have lower levels of education and more likely to have attended high school. In terms of immigration-related characteristics, Mexican-born farmworkers in new destination states are more likely to report that they are naturalized citizens, have greater English language ability, but are usually more recent arrivals to the United States than those living in traditional settlement states (Table 5.1).

The mean work and economic characteristics by year and destination type are presented in Table 5.1. The percentage of Mexican-born farmworkers employed in crop
Table 5.1 Mean Values and Percentages of Demographic and Socioeconomic Variables for Mexican-Born Farmworkers 1980-2007

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>Other States</th>
<th>1990</th>
<th>Other States</th>
<th>2000</th>
<th>Other States</th>
<th>2005-07</th>
<th>Other States</th>
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<td></td>
<td>CA/TX</td>
<td></td>
<td>CA/TX</td>
<td></td>
<td>CA/TX</td>
<td></td>
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<td>Age</td>
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<td>32.6</td>
<td>34.1</td>
<td>32.6</td>
<td>35.5</td>
<td>32.6</td>
<td>36.7</td>
<td>34.7</td>
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<td>Sex</td>
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<td>79.0</td>
<td>84.5</td>
<td>76.1</td>
<td>82.7</td>
<td>77.1</td>
<td>81.1</td>
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<td>Married</td>
<td>73.4</td>
<td>69.4</td>
<td>67.6</td>
<td>63.9</td>
<td>67.4</td>
<td>61.1</td>
<td>63.9</td>
<td>59.0</td>
</tr>
<tr>
<td>Education (percent)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school or less</td>
<td>47.3</td>
<td>45.3</td>
<td>40.4</td>
<td>37.2</td>
<td>31.8</td>
<td>24.7</td>
<td>27.1</td>
<td>20.5</td>
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<td>Middle school</td>
<td>34.6</td>
<td>38.1</td>
<td>35.0</td>
<td>37.6</td>
<td>39.3</td>
<td>39.2</td>
<td>41.4</td>
<td>36.9</td>
</tr>
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<td>Ninth through high school</td>
<td>15.5</td>
<td>14.7</td>
<td>21.0</td>
<td>22.2</td>
<td>25.9</td>
<td>32.7</td>
<td>28.6</td>
<td>38.9</td>
</tr>
<tr>
<td>Some college through bachelor’s</td>
<td>2.7</td>
<td>2.0</td>
<td>3.6</td>
<td>3.0</td>
<td>3.0</td>
<td>3.3</td>
<td>3.0</td>
<td>3.8</td>
</tr>
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<td>Citizenship status</td>
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<td>20.8</td>
<td>14.5</td>
<td>14.1</td>
<td>9.3</td>
<td>10.0</td>
</tr>
<tr>
<td>Speaks English</td>
<td>55.6</td>
<td>64.9</td>
<td>62.6</td>
<td>73.3</td>
<td>54.5</td>
<td>67.7</td>
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<td>63.9</td>
</tr>
<tr>
<td>Length of Residence in United States (percent)</td>
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<td></td>
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<td></td>
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<td>Recent (less than 10 years)</td>
<td>60.1</td>
<td>65.7</td>
<td>50.8</td>
<td>61.0</td>
<td>41.6</td>
<td>57.9</td>
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<td>55.8</td>
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<td>Intermediate (11-20 year)</td>
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<td>21.6</td>
<td>33.8</td>
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<td>29.3</td>
<td>28.9</td>
<td>28.9</td>
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<tr>
<td>Long-term (21 or more years)</td>
<td>13.7</td>
<td>12.7</td>
<td>15.4</td>
<td>10.3</td>
<td>24.3</td>
<td>12.9</td>
<td>28.4</td>
<td>15.2</td>
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<td>Work</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Crop worker</td>
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<td>85.3</td>
<td>90.2</td>
<td>87.6</td>
<td>87.5</td>
<td>80.3</td>
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<td>75.7</td>
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<tr>
<td>Weeks worked</td>
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<td>40.2</td>
<td>37.2</td>
<td>38.6</td>
<td>38.3</td>
<td>41.5</td>
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<td>44.0</td>
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<tr>
<td>Usual hours worked</td>
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<td>46.6</td>
<td>47.4</td>
<td>46.4</td>
<td>47.2</td>
<td>46.8</td>
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<tr>
<td>Hourly earnings¹</td>
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<td>8.4</td>
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<td>8.2</td>
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<tr>
<td>Logged hourly earnings¹</td>
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<td>2.00</td>
<td>2.05</td>
<td>1.98</td>
<td>2.02</td>
<td>2.0</td>
<td>2.05</td>
<td>2.02</td>
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<tr>
<td>Total annual income</td>
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<td>15,413</td>
<td>15,013</td>
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<td>15,319</td>
<td>15,867</td>
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<td>16,589</td>
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<tr>
<td>Total annual income from wages</td>
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<td>15,158</td>
<td>14,415</td>
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<td>14,586</td>
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<td>Poverty status</td>
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<td>7,474</td>
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<td>10,050</td>
<td>6,176</td>
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</table>

¹Sample restricted to wage workers who usually work 35 hrs per week and worked 12 or more weeks in the previous year.
production (as opposed to livestock production) is greater in CA/TX throughout the study period. Because crop production is more seasonal than livestock production, the average number of weeks worked per year is also consistently lower in CA/TX. The usual number of hours worked per week is roughly the same across destinations. Average hourly earnings are greater for Mexican-born farmworkers in CA/TX, but this wage gap declines significantly over time. The log hourly earnings follow a similar pattern. Total annual income, which reports personal yearly income from all sources, is higher in CA/TX in 1990 and 2000 but is higher in Other States in 2000 and 2007. There is a similar change in inequalities by destination type for total annual income from wages.

From the preceding discussion it is clear that there are social and economic differences between Mexican-born farmworkers living in new destination states and those in traditional settlement states. One such difference, which has substantial implications for the economic well-being of these workers, are the inequalities in earnings by destination type which have reversed over time. In the remainder of this chapter I use multivariate regression analysis and decomposition analysis to better explain the changing relationship between earnings and destination type for farmworkers employed 12 per year or more.

**Multivariate Regression Models**

To explain the changing earnings inequalities between Mexican-born farmworkers, I use multivariate OLS regression analysis to model the relationship between log hourly earnings and destination type over time while controlling for
demographic, immigration-related, and work characteristics (Table 5.2). The overall strategy of the multiple regression analysis is to first model the changes in earnings inequalities over time (Model 1) and then to account for these changes by controlling for demographic (Model 2), educational attainment (Model 3), immigration-related (Model 4), work and economic (Model 5) characteristics as well as a full model (Model 6). Model 1 includes a dummy variable for destination type (CA/TX) that is coded 1 if the farmworker lives in California or Texas and 0 if they live in the Other States, dummy variables for years (1980 is the omitted category), and interaction terms between destination type and year. Interaction terms are used in multiple regression models when the relationship between the independent and dependent variables is moderated by another variable (Jaccard and Turrisi 2003). Because the findings from the descriptive analysis indicate that the relationship between earnings and destination type changed over time, the interaction between destination type and year is modeled in this analysis.

The predicted log hourly earnings of Mexican-born farmworkers are graphed in Figure 5.1. The data for this graph come from the regression coefficients in the full model (Model 6) in Table 5.2 and so they include controls for the demographic, immigration-related, and work characteristics of individuals. The solid line represents the log hourly earnings of farmworkers in CA/TX while the dashed line represents the earnings of those in Other States. While the earnings of Mexican-born farmworkers in CA/TX and Other States followed a very similar pattern from 1980 to 1990 (the solid and dashed lines are almost parallel) the trend in earnings and destination type clearly diverged from 1990 to
2000. During the 1990s, hourly earnings for farmworkers in CA/TX—relative to farmworkers in CA/TX in 1980—declined by five percent while the earnings of farmworkers in Other States—relative to farmworkers in CA/TX in 1980—increased by nearly that same amount (5%). By 2000, the earnings gap had been completely ameliorated, but from 2000-2007, earnings grew at a faster pace in CA/TX than in Other States. Despite the renewed growth in log hourly earnings in CA/TX in 2007, Mexican-born farmworkers in these states were still earning considerably less than they were in 1980 while the earnings of farmworkers in Other States were higher in 2007 than in 1980. Not only is this evident from Figure 5.1 but also the interaction term for destination type in 2007 (Table 5.2) is negative and statistically significant.
Table 5.2 OLS Regression of Log Hourly Earnings1 for Mexican-Born Farmworkers in the United States 1980-2007 (Std. Error)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.008</td>
<td>1.442</td>
<td>2.000</td>
<td>2.063</td>
<td>2.101</td>
<td>1.671</td>
</tr>
<tr>
<td></td>
<td>(.014) ***</td>
<td>(.025) ***</td>
<td>(.014) ***</td>
<td>(.015) ***</td>
<td>(.017) ***</td>
<td>(.029) ***</td>
</tr>
<tr>
<td>CA/TX</td>
<td>0.095</td>
<td>0.095</td>
<td>0.096</td>
<td>0.095</td>
<td>0.097</td>
<td>0.095</td>
</tr>
<tr>
<td></td>
<td>(.015) ***</td>
<td>(.015) ***</td>
<td>(.015) ***</td>
<td>(.015) ***</td>
<td>(.015) ***</td>
<td>(.015) ***</td>
</tr>
<tr>
<td>Year (Reference: 1980)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>-0.024</td>
<td>-0.026</td>
<td>-0.025</td>
<td>-0.032</td>
<td>-0.025</td>
<td>-0.038</td>
</tr>
<tr>
<td></td>
<td>(.016)</td>
<td>(.015)</td>
<td>(.016)</td>
<td>(.016) *</td>
<td>(.016)</td>
<td>(.015) *</td>
</tr>
<tr>
<td>2000</td>
<td>-0.002</td>
<td>-0.001</td>
<td>-0.005</td>
<td>-0.011</td>
<td>-0.004</td>
<td>-0.013</td>
</tr>
<tr>
<td></td>
<td>(.015)</td>
<td>(.014)</td>
<td>(.015)</td>
<td>(.015)</td>
<td>(.015)</td>
<td>(.014)</td>
</tr>
<tr>
<td>2007</td>
<td>0.016</td>
<td>0.010</td>
<td>0.013</td>
<td>0.007</td>
<td>0.014</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(.016)</td>
<td>(.015)</td>
<td>(.016)</td>
<td>(.015)</td>
<td>(.016)</td>
<td>(.015)</td>
</tr>
<tr>
<td>Interaction Effects (Reference: CA/TX*1980)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA/TX*1990</td>
<td>-0.031</td>
<td>-0.032</td>
<td>-0.031</td>
<td>-0.037</td>
<td>-0.032</td>
<td>-0.035</td>
</tr>
<tr>
<td></td>
<td>(.018)</td>
<td>(.018)</td>
<td>(.018)</td>
<td>(.018) *</td>
<td>(.018)</td>
<td>(.017) *</td>
</tr>
<tr>
<td>CA/TX*2000</td>
<td>-0.081</td>
<td>-0.088</td>
<td>-0.080</td>
<td>-0.094</td>
<td>-0.081</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(.017) ***</td>
<td>(.016) ***</td>
<td>(.017) ***</td>
<td>(.017) ***</td>
<td>(.017) ***</td>
<td>(.016) ***</td>
</tr>
<tr>
<td>CA/TX*2007</td>
<td>-0.063</td>
<td>-0.066</td>
<td>-0.063</td>
<td>-0.071</td>
<td>-0.062</td>
<td>-0.067</td>
</tr>
<tr>
<td></td>
<td>(.018) **</td>
<td>(.018) **</td>
<td>(.018) **</td>
<td>(.018) **</td>
<td>(.018) **</td>
<td>(.018) **</td>
</tr>
<tr>
<td>Demographic characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.023</td>
<td>0.023</td>
<td>0.023</td>
<td>0.019</td>
<td>0.019</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(.001) ***</td>
<td>(.001) ***</td>
<td>(.001) ***</td>
<td>(.001) ***</td>
<td>(.001) ***</td>
<td>(.001) ***</td>
</tr>
<tr>
<td>Age2</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(.000) ***</td>
<td>(.000) ***</td>
<td>(.000) ***</td>
<td>(.000) ***</td>
<td>(.000) ***</td>
<td>(.000) ***</td>
</tr>
<tr>
<td>Male</td>
<td>0.099</td>
<td>0.099</td>
<td>0.099</td>
<td>0.114</td>
<td>0.114</td>
<td>0.114</td>
</tr>
<tr>
<td></td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
</tr>
<tr>
<td>Married</td>
<td>0.065</td>
<td>0.065</td>
<td>0.065</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
</tr>
<tr>
<td></td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
<td>(.005) ***</td>
</tr>
</tbody>
</table>
Table 5.2 Continued

**Educational attainment** (Reference: Elementary school or less)

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle school</td>
<td>0.015</td>
<td>0.034</td>
<td>(.005) **</td>
</tr>
<tr>
<td>Ninth through high school</td>
<td>0.008</td>
<td>0.042</td>
<td>(.006) ***</td>
</tr>
<tr>
<td>Some college through bachelor’s</td>
<td>0.058</td>
<td>0.068</td>
<td>(.013) *</td>
</tr>
</tbody>
</table>

**Immigration-related characteristics**

<table>
<thead>
<tr>
<th>Citizenship status</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizenship status</td>
<td>0.014</td>
<td>0.014</td>
<td>(.006) *</td>
</tr>
<tr>
<td>Speaks English</td>
<td>0.049</td>
<td>0.041</td>
<td>(.004) ***</td>
</tr>
</tbody>
</table>

**Length of Residence in U.S.** (Reference: Long-term—21 or more years)

<table>
<thead>
<tr>
<th>Residence Duration</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent—less than 10 years</td>
<td>-0.130</td>
<td>-0.093</td>
<td>(.006) ***</td>
</tr>
<tr>
<td>Intermediate—11-20 years</td>
<td>-0.024</td>
<td>-0.019</td>
<td>(.006) **</td>
</tr>
</tbody>
</table>

**Work characteristics**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop worker</td>
<td>-0.058</td>
<td>-0.040</td>
<td>(.006) ***</td>
</tr>
<tr>
<td>Weeks worked</td>
<td>-0.001</td>
<td>-0.003</td>
<td>(.000) ***</td>
</tr>
</tbody>
</table>

| Adjusted R²                      |             | (.005)         | (.040)    | (.006)    | (.031)    | (.008)    | (.059)    |

*p< .05; **p< .01; ***p< .001.

1 Sample restricted to wage workers who usually work 35 hrs per week and worked 12 or more weeks in the previous year.
Model 2 introduces several demographic variables to help control for compositional differences of the workers across destination types. Age has a large impact on the wages (2.3% increase for each year) of Mexican-born farmworkers. However, this relationship is curvilinear—as indicated by the negative coefficient for age^2—meaning that hourly earnings eventually decrease with age. Male farmworkers have 10 percent higher hourly earnings than female farmworkers and farmworkers that are married have 6.5 percent higher hourly earnings than those that are not married. These demographic control variables are all statistically significant. After controlling for demographic composition, inequalities in hourly earnings by destination type still reversed from 1990-2000. In fact, the demographic controls increased the percentage that earnings declined in CA/TX relative to Other States in 2000 from 8.1 percent in Model 1 to 8.8 percent in Model 2.

Model 3 controls for educational attainment which has been coded into three dummy variables—middle school, ninth through high school, and some college through bachelor’s degree—with elementary school or less as the reference category. As expected, farmworkers with higher educational attainment earn higher hourly earnings, but only middle school and some college through bachelor’s degree were statistically significant. The increase in hourly earnings for farmworkers in CA/TX in 1980 and the lower decline for CA/TX in 2000 in Model 3 shows that educational attainment has a greater influence on hourly earnings in CA/TX.

Model 4 controls for immigration-related characteristics including citizenship status, English language ability, and length of residence in the United States. Citizenship status increases hourly earnings, but this relationship is not statistically significant. The
hourly earnings of Mexican-born farmworkers are 5 percent higher for those that speak English than those that do not speak English. Hourly earnings also increase with the length of residence in the United States. Farmworkers who have been in the U.S. less than 10 years have hourly earnings that are 13 percent lower than those that have been in the U.S. 21 years or more. The earnings gap between recent and longer term arrivals is less pronounced for farmworkers that have lived in the United States for 11-20 years who earn only 2.4 percent less than long-term immigrants. Controlling for immigration-related characteristics had no effect on the earnings inequalities by destination in 1980 but increased the inequalities between traditional and new settlement states in 2000 and 2007. This finding indicates that the returns to having U.S. experience have increased over time, which might be related to the fact that more Mexican-born farmworkers are employed in the livestock industry (Chapter 6). Livestock production generally requires higher skilled workers than crop production.

Model 5 introduces control variables for the type of agricultural industry and the number of weeks worked each year. Farmworkers in crop production have 5 percent lower hourly earnings than those that are employed in livestock production. This relationship is statistically significant. While this relationship is statistically significant, it accounts for only a 0.1 percent decrease in hourly earnings per additional week of work. In this model, earnings inequalities in 1980 increased while there was no change in the earnings inequalities in 2000 found in Model 1.

The final model (Model 6) combines all of the control variables from the previous regressions into one model. In the full model, being male has a significantly larger effect on hourly earnings than it did in the previous model. Also, the effect of educational
attainment increased with the greatest change being for farmworkers with a ninth through high school level of education. While controlling for other factors, the effects of length of residence in the U.S. on hourly earnings declined. Additional analyses (not shown) found that this decline in the effect of length of residence in the U.S. is due to controlling for age and $age^2$, which could indicate that a lot of the effect of length of residence in the immigration-related characteristic model is actually the age of the individual and not necessarily their U.S. experience. In the full model, type of industry became less of a predictor while the coefficient for number of hours worked increased. Despite controlling for demographic, immigration-related, and work characteristics, hourly earnings were still higher in CA/TX in 1980 and then decreased in 2000 relative to hourly earnings in Other States. Introducing the control variables had no effect on earnings in CA/TX in 1980 over the base model but increased the earnings differentials in 2000.

These findings from multiple regression analysis are consistent with the findings of the empirical research on the earnings of Mexican-born immigrants summarized in Chapter 2. As with those studies, Mexican-born farmworkers that were male, older, and married had higher earnings than younger, female, or farmworkers that are not married. Like other immigrants, Mexican-born farmworkers pay a wage penalty when they are not a U.S. citizen, do not speak English, and are recent arrivals to the United States. Also, Mexican-born immigrants that work in livestock production have higher earnings than those working in crop production. Controlling for these factors had varying effects on the relationship between destination type and earnings over time. For instance, the interaction between CA/TX and the year 2000 had its largest increases when controlling for demographic or immigration-related characteristics, but had relatively no change when
controlling for education or work characteristics. Furthermore, controlling for these different characteristics does not fully account for the changes in earnings over time that are observed in the base model. This is explored further in the next section using decomposition analysis.

**Decomposition Analysis**

From the descriptive analysis above, it is clear that as the proportion of Mexican-born farmworkers living in new settlement states has increased and that there has been a subsequent shift in the demographic, social, and economic composition of this population. The findings from the multivariate regression analysis indicate that there has also been a shift in the associations between characteristics related to earnings, which can be conceptualized as the structure of earnings for this population. In order to separate the effects of changes in the population composition from changes in returns to workers’ characteristics, I decompose the changes in earnings for Mexican-born farmworkers as a whole and then by destination type from 1990 to 2000, the decade in which there were the most divergent patterns in earnings.

Decomposition analysis is an appropriate method for partitioning the total change in the dependent variable into change that is attributable to changes in the composition of the population and change that is attributable to change in the association of characteristics of the dependent variable (Blinder 1973; Firebaugh 1997; Oaxaca 1973). Specifically, this method is able to separate the total change in earnings into the change from shifts in the composition of Mexican-born farmworkers (composition) and change from the returns to workers’ characteristics (returns).
Table 5.3 Decomposition of the Change in Log Hourly Earnings of Mexican-origin Farmworkers 1990-2000

<table>
<thead>
<tr>
<th>Subcomponents of Change</th>
<th>Overall Comp.</th>
<th>Overall Structure</th>
<th>Overall Total</th>
<th>CA/TX Comp.</th>
<th>CA/TX Structure</th>
<th>CA/TX Total</th>
<th>Other States Comp.</th>
<th>Other States Structure</th>
<th>Other States Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.0000</td>
<td>-0.073</td>
<td>-0.073</td>
<td>0.0000</td>
<td>-0.1215</td>
<td>-0.1215</td>
<td>0.0000</td>
<td>-0.2073</td>
<td>-0.2073</td>
</tr>
<tr>
<td>CA/TX</td>
<td>-0.0002</td>
<td>-0.039</td>
<td>-0.039</td>
<td>-0.0098</td>
<td>-0.0383</td>
<td>-0.0383</td>
<td>-0.1392</td>
<td>-0.1390</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.0156</td>
<td>0.113</td>
<td>0.129</td>
<td>0.0352</td>
<td>0.0840</td>
<td>0.1192</td>
<td>0.0006</td>
<td>0.3661</td>
<td>0.3668</td>
</tr>
<tr>
<td>Age(^2)</td>
<td>-0.0122</td>
<td>-0.027</td>
<td>-0.039</td>
<td>-0.0285</td>
<td>-0.0098</td>
<td>-0.0383</td>
<td>0.0001</td>
<td>-0.1392</td>
<td>-0.1390</td>
</tr>
<tr>
<td>Male</td>
<td>-0.0023</td>
<td>0.015</td>
<td>0.013</td>
<td>-0.0042</td>
<td>0.0292</td>
<td>0.0250</td>
<td>-0.0015</td>
<td>-0.0126</td>
<td>-0.0141</td>
</tr>
<tr>
<td>Married</td>
<td>-0.0010</td>
<td>-0.001</td>
<td>-0.002</td>
<td>-0.0001</td>
<td>0.0072</td>
<td>0.0070</td>
<td>-0.0017</td>
<td>-0.0260</td>
<td>-0.0277</td>
</tr>
<tr>
<td>Middle school</td>
<td>0.0013</td>
<td>0.005</td>
<td>0.006</td>
<td>0.0015</td>
<td>-0.0038</td>
<td>-0.0023</td>
<td>0.0006</td>
<td>0.0313</td>
<td>0.0319</td>
</tr>
<tr>
<td>High school</td>
<td>0.0029</td>
<td>-0.001</td>
<td>0.002</td>
<td>0.0020</td>
<td>-0.0058</td>
<td>-0.0038</td>
<td>0.0040</td>
<td>0.0140</td>
<td>0.0180</td>
</tr>
<tr>
<td>Some college</td>
<td>-0.0002</td>
<td>0.001</td>
<td>0.001</td>
<td>-0.0007</td>
<td>0.0025</td>
<td>0.0018</td>
<td>0.0002</td>
<td>-0.0015</td>
<td>-0.0013</td>
</tr>
<tr>
<td>Citizenship status</td>
<td>-0.0025</td>
<td>0.017</td>
<td>0.015</td>
<td>-0.0016</td>
<td>0.0194</td>
<td>0.0178</td>
<td>-0.0051</td>
<td>0.0095</td>
<td>0.0044</td>
</tr>
<tr>
<td>Speaks English</td>
<td>-0.0024</td>
<td>0.012</td>
<td>0.009</td>
<td>-0.0039</td>
<td>0.0190</td>
<td>0.0151</td>
<td>-0.0014</td>
<td>-0.0104</td>
<td>-0.0118</td>
</tr>
<tr>
<td>Recent—less than 10 yrs</td>
<td>0.0049</td>
<td>0.018</td>
<td>0.023</td>
<td>0.0066</td>
<td>0.0239</td>
<td>0.0305</td>
<td>0.0031</td>
<td>0.0109</td>
<td>0.0141</td>
</tr>
<tr>
<td>Intermediate—11-20 yrs</td>
<td>0.0000</td>
<td>0.008</td>
<td>0.008</td>
<td>-0.0001</td>
<td>0.0087</td>
<td>0.0086</td>
<td>0.0000</td>
<td>0.0068</td>
<td>0.0067</td>
</tr>
<tr>
<td>Crop worker</td>
<td>0.0029</td>
<td>-0.071</td>
<td>-0.068</td>
<td>0.0011</td>
<td>-0.0649</td>
<td>-0.0637</td>
<td>0.0058</td>
<td>-0.0566</td>
<td>-0.0507</td>
</tr>
<tr>
<td>Weeks worked</td>
<td>-0.0054</td>
<td>0.006</td>
<td>0.000</td>
<td>-0.0042</td>
<td>-0.0194</td>
<td>-0.0236</td>
<td>-0.0031</td>
<td>0.0351</td>
<td>0.0321</td>
</tr>
<tr>
<td>Total Change</td>
<td>0.004</td>
<td>-0.017</td>
<td>-0.016</td>
<td>0.0033</td>
<td>-0.0313</td>
<td>-0.0281</td>
<td>0.0016</td>
<td>0.0203</td>
<td>0.0219</td>
</tr>
</tbody>
</table>
I conduct three separate decomposition analyses. The first analysis decomposes the change in hourly earnings from 1990-2000 for all Mexican-born farmworkers that worked 12 weeks or more in the previous year, the second focuses specifically on the change in hourly earnings from 1990-2000 for those living in CA/TX, and the final analysis decomposes the change in hourly earnings for farmworkers in Other States for this same time period. The logic behind performing three separate decompositions is to measure the components of change for the overall population in order to identify general patterns and then to measure the components of change for each destination type separately to see if there are differences in how earnings changed over the decade.

Table 5.3 shows the decomposition of the change in log hourly earnings from 1990 to 2000 for the overall population, CA/TX, and Other States. The total change in overall decomposition indicates that, during this period, hourly earnings for all Mexican-born farmworkers declined by 1.6 percent. However, the change in the composition of the population component actually had a positive effect (.004) on earnings meaning that had the returns to workers’ characteristics remained constant, the log hourly earnings would have increased because of the positive impact of the change in population composition on earnings. The gains from the shift in population composition were off-set by the decline in the returns to workers’ characteristics of earnings of 1.7 percent.

An advantage of using decomposition analysis is that is allows the overall component of change to be broken down into its various subcomponents. Focusing first on the subcomponents of the returns to workers’ characteristics component of change, the overall earnings would have been 16.3\(^{14}\) percent higher had earnings not declined in CA/TX. Hourly earnings of all Mexican-born farmworkers were 51 percent higher

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\(^{14}\) Calculated as the percentage of change in the returns to workers’ characteristics from living in CA/TX.
because wages were higher for older farmworkers. The type of production also had a large effect on the change in earnings since overall earnings would have been nearly 30 percent higher had earnings not declined for crop workers.

As mentioned above, change in the composition of the population had less of an impact on the change in earnings. Earnings were 7 percent higher because of changes in the age distribution. Also the percentage of farmworkers with ninth through high school education and recent immigrants prevented earnings from declining even more. It is important to point out that changes in the overall earnings are complicated by variations in the components of change in earnings across destinations. To better understand the unique dynamics in each destination type, I also show the findings from two additional destination-specific decomposition analyses, the first focusing on the change in log hourly earnings from 1990-2000 in just CA/TX and the second on the Other States (Table 5.3).

**Destination-specific Decompositions**

Table 5.3 reports the findings from destination-specific decomposition analyses which like the decomposition of overall change, model the change in log hourly earnings from 1990-2000 but are estimated for CA/TX and Other States separately. From 1990 to 2000, the log hourly earnings of Mexican-born farmworkers declined in CA/TX by 2.8 percent while they increased by 2.2 percent for those in Other States. Despite this divergence in trends, the change in earnings that is attributable to the shift in the population composition was positive in both destinations, and was in fact, larger in CA/TX than Other States, .0033 and .0016, respectively. Similar to the overall model, the
returns to workers’ characteristics component of change had a greater effect on hourly wages than the shift in population composition in both destinations. However, this change was negative in CA/TX (-.0313) and positive in Other States (.0203) indicating that the change in the returns to worker characteristics for Mexican-born farmworkers in each destination were substantially different. This becomes more apparent when comparing the subcomponents of change across destination types.

The subcomponents of change for the destination-specific decomposition analyses are reported in Table 5.3. To better illustrate the differences in subcomponents of change by destination type, I have graphed the percentage of change in log hourly earnings that is attributable to changes in the population composition (Figure 5.2) and the percentage that is attributable to change in the returns to worker characteristics from 1990 to 2000.
(Figure 5.3) for each subcomponent by destination type. In CA/TX, the subcomponents of change that had the largest impact on the change from the population composition was age of the farmworkers which accounted for roughly 12 percent of the increase in earnings due to changes in composition. Age2 also had a large effect on the change due to change in the population composition in CA/TX. Surprisingly, change in the age composition of the population had relatively no effect on the change in earnings from the composition change in Other States. In both destinations, change in gender composition and marital status had negative impacts on the change in earnings due to shifts in the population composition, however, their impact was relatively small. The education subcomponents had mixed effects as the change in the middle school and high school increased the change in this component while some college decreased it in both destination types. Change in the composition of citizenship status and the ability to speak English both had negative impacts on the change in earnings from the change in the composition. Shifts in number of Mexican-born farmworkers that had been in the United States for 10 years or less increased the change in earnings due to the composition by nearly 3 percent in CA/TX and just under 2 percent in Other States. The change in crop workers increased wages in both CA/TX and Other States but the percentage of change was greater in Other States reflecting changes in the structure of agriculture in these destinations. Weeks worked, which is an indication of seasonal employment had a negative effect on the change in earnings due to changes in the composition. There was considerable variation in the subcomponents of the change in earnings due to shifts in the population composition by destination type.
There were also considerable differences in the subcomponents of the change in earnings due to the shift in the returns to workers characteristics by destination type (Figure 5.3). The change in the way that earnings are related to age had the largest effect on the increase in the structure of earnings. This effect was greater in Other States than in CA/TX. Being male had a positive effect on the change in earnings due to the structure of earnings in CA/TX but a negative effect in Other States. There was a similar pattern with educational attainment where earnings increased in Other States but decreased in CA/TX. Changes in the way that earnings were related to citizenship status, the ability to speak English, and length of residence in the United States in CA/TX were positive meaning that the decline in earnings due to the shift in the structure of earnings would have been
greater had there not been changes in the immigration-related characteristics in those states. The change in the way that immigration-related characteristics were related to earnings had only minimal effects in Other States. A substantial percentage of the decline in the returns to workers’ characteristics was from the changes in the relationship between working in crop production and earnings. The negative effect of crop production was greater in CA/TX than in Other States. Again, there is considerable variation in the subcomponents of the change in earnings that are due to change in the returns to workers’ characteristics by destination type.

The decomposition analyses presented in this chapter provide a more nuanced explanation of the changes in earnings for Mexican-born farmworkers than could be modeled in the multiple regression analysis. These decompositions showed that changes in the returns to workers’ characteristics had a larger impact on the overall change in earnings than the shift in population composition in both destination types. Also, the overall effect of the returns to workers’ characteristics component was negative in CA/TX and positive in Other States. Another important finding from the decomposition analyses is that there are variations in the subcomponents of change by destination type. Of the different subcomponents of change included in the decompositions, age had a substantial effect on the change in earnings from both composition and structure. In both CA/TX and Other States, older farmworkers are receiving higher wages. This could explain why the findings in Chapter 4 showed Mexican-born farmworkers are not aging out of agriculture at high rates predicted by other analyses (Martin 2002).
Conclusion

Since 1980, there has been a dramatic change in the spatial distribution of Mexican-born farmworkers in the United States. As farmworkers sought out new destinations, differences in the demographic, immigration-related, and work characteristics declined. One of the more substantial differences between Mexican-born farmworkers by destination type was in total annual income and earnings. In 1980, Mexican-born farmworkers in CA/TX had higher incomes and earnings than those living in Other States. By 2000, however, these income inequalities had reversed as the returns to earnings in new destinations increased while they decreased in traditional settlement areas.

One explanation for the declining structure of wages for all farmworkers, especially for workers in traditional settlement areas, since 1980 could be the dramatic increase in the supply of Mexican-born migrants working in agriculture as a result of the Seasonal Agricultural Workers Program (SAW). This provision, under IRCA, granted amnesty for over 1 million Mexican immigrants who claimed to have previously worked in U.S. agriculture. However, it is unknown how many of these immigrants remained in agriculture after receiving amnesty.

Increases in the earnings of Mexican-born farmworkers in new destinations might also be indicative of changes in structure of agriculture in those states. Differences in the type of production and weeks worked per year by destination type have been increasing over time, which will continue to impact the earnings of Mexican-born farmworkers in new destinations. Unfortunately, these data do not allow for a detailed analysis of the specific commodity sectors in which Mexican-born farmworkers are employed.
Changes in the age structure of farmworkers suggest that Mexican immigrants were transitioning out of agriculture, or bypassing it altogether. The age structure of this population had a substantial impact on changes in the earnings structure in both traditional and new agricultural settlement areas. Overall, the population of Mexican-born farmworkers was getting older at the same time that the earnings of older farmworkers increased. Immigration from Mexico increased during the 1990s and the findings above indicate that younger men were bypassing agriculture and working in other industries. This was especially apparent in California and Texas. The increased wages for older workers who remain in agriculture could also be the result of younger and more recent Mexican immigrants not only choosing to settle in new destinations but they also choosing to work in new occupations. However, empirically testing this is beyond the scope of this analysis.
Chapter 6

Agricultural Restructuring and the Demand for Hired Farm Labor

Among the most dramatic changes to the U.S. economy and society in the last 100 years has been the decline of farming as the main livelihood strategy of a large proportion of the population and the corresponding changes in the structure of agriculture that have accompanied this decline (Lobao and Meyer 2001). Following World War II, new patterns of production emerged that began restructuring the food and fiber system. Since that time, the number of farms has precipitously declined while the average farm size has increased (Albrecht and Murdock 1988). The livestock industry, once characterized by the vast number of producers, has become increasingly consolidated as the numbers of large cattle feedlots and megadairies\textsuperscript{15} has grown (Cross 2006; Sharp, Roe, and Irwin 2002). More than half of all farm households rely on additional sources of non-farm income because they are unable to make a viable living with only their income from farming (Bell 2004). The average age of farm operators has also been steadily climbing and is now approaching 60 years of age (Jackson-Smith 1999). Overall, the agricultural sector has become industrialized as some farms are increasing their size and scale of production to remain viable and competitive.

Agricultural restructuring has also led to changes in the demand for hired farm labor in the United States. As the farm sector becomes more industrial, there is a greater reliance on non-family labor (Friedland, Barton, and Thomas 1981). While

\textsuperscript{15} The term “megadairy” is used in the dairy production literature to describe dairy farms with at least 500 cows.
mechanization in some sectors has reduced the need for hired labor, other commodities have become more labor intensive. For instance, as a result of restructuring in the dairy industry, many farms have increased the size of their herds to the point that they are unable to supply all of the labor from within the household (Cross 2006). Agricultural restructuring is also changing the geographic distribution of hired farm labor. In recent years, the fresh fruits and vegetables (FFV) sector has grown in areas outside of the traditional “fruit belt” and this has increased the number of farmworkers in those areas (Martin, Fix, and Taylor 2006).

This chapter focuses on the relationship between agricultural restructuring and the demand for hired farm labor in new destinations and addresses the following research questions. First, how is the demand for hired farm labor different in traditional settlement states (California and Texas) from the demand for hired farm labor in new destination states (Other States)? Second, how does agricultural restructuring affect the demand for hired farm labor? Finally, what differences are there by destination type in how agricultural restructuring is related to the demand for hired farm labor? The data for this analysis come from the 1997, 2002, and 2007 Censuses of Agriculture and are aggregated at the county-level. The analytic strategy combines aspatial descriptive statistics, spatial descriptive statistics, and multivariate regression models. A more detailed description of the data and methods are found in Chapter 3. This chapter is organized into three sections. The first focuses on the demand for hired farm labor in counties across destination types. The next section presents results from the spatial descriptive analysis of the demand for hired labor. The final section presents the results from first differenced
multiple regression models of the changing structure of agriculture and the increasing demand for hired farm labor.

**Demand for Hired Labor**

The demand for labor is difficult to measure without at the same time making assumptions about the supply of labor or the demand for other production inputs (Hamermesh 1993). Economists generally conceptualize labor demand as the unmet need for workers in a labor market or a firm’s decisions about how many units of labor (a function of the number of employees and hours worked) are needed for production. In this analysis, the demand for hired farm labor is operationalized as the percentage of farms in a county with any hired labor. Given that not all farms hire workers, this is an appropriate indicator of the need for workers at the county level. Mean indicators for the demand for hired farm labor across destination types are found in Table 6.1. It is important to point out that because of the limitations with the comparability of different Censuses of Agriculture, I am only able to look at the more detailed hired labor characteristics for 2002 and 2007. While the changes between 2002 and 2007 observed in Table 6.1 are indicative of longstanding trends in the demand for hired labor, they more than likely also include some period or cyclical effects. Between 2002 and 2007, the average percentage of farms with any hired labor for all counties in the United States declined. In all, the number of farms reporting any hired labor declined by nearly 13 percent. This decline in the demand for hired labor was greater in California and Texas.

16 Although this definition of the demand for hired farm labor is different from the “unmet need” or “production function” approaches that are typically used to denote labor demand, it does allow for a county-level indicator. The unemployment rate is also a county-level indicator that could be used to approximate unmet need. However, given the atypical nature of farm labor, it is doubtful that the county-level unemployment rate would be a robust indicator of unmet need in the agricultural sector.
Table 6.1 Mean Indicators of the Demand for Hired Farm Labor, 2002 and 2007

<table>
<thead>
<tr>
<th>Percentage of farms</th>
<th>All Counties 1</th>
<th>CA/TX</th>
<th>Other States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any hired labor</td>
<td>26.9</td>
<td>22.6</td>
<td>28.0</td>
</tr>
<tr>
<td>Migrant labor</td>
<td>8.3</td>
<td>6.9</td>
<td>9.0</td>
</tr>
<tr>
<td>4 or fewer workers</td>
<td>78.1</td>
<td>79.2</td>
<td>78.2</td>
</tr>
<tr>
<td>5-9 workers</td>
<td>13.4</td>
<td>13.6</td>
<td>13.3</td>
</tr>
<tr>
<td>10 or more workers</td>
<td>14.7</td>
<td>8.3</td>
<td>13.5</td>
</tr>
<tr>
<td>Percent of Workers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seasonal</td>
<td>69.6</td>
<td>67.3</td>
<td>66.6</td>
</tr>
<tr>
<td>Long-term</td>
<td>31.0</td>
<td>32.9</td>
<td>33.6</td>
</tr>
<tr>
<td>Average workers per farm</td>
<td>4.6</td>
<td>4.6</td>
<td>5.3</td>
</tr>
<tr>
<td>Average payroll (in thousands)</td>
<td>28.1</td>
<td>36.7</td>
<td>38.4</td>
</tr>
<tr>
<td>(N)</td>
<td>3068</td>
<td>312</td>
<td>2756</td>
</tr>
</tbody>
</table>

1 Some counties were excluded from the analysis because of data availability

than it was in Other States. The demand for migrant labor, which is operationalized as the percentage of farms with hired labor reporting hiring any migrant workers, also declined from 2002 to 2007, but not as much as the overall demand for hired labor.

The change in demand for hired labor was disproportionately higher for farms that employ more workers (Table 6.1). The percentage of farms with any hired labor reporting 4 or fewer workers actually increased from 2002 to 2007 across all destination types.

While there was a decline in the percentage of moderately sized labor farms in traditional settlement states, there was relatively no change in farms with 5-9 workers in new destinations. In fact, the average workers per farm remained the same from 2002 to 2007 at 4.6 per farm in all counties, 5.4 in CA/TX, and 4.5 in Other States. The greatest declines were in the proportion of farms with a large number of hired workers, those with 10 or more employees, which declined substantially across all destination types. These
large labor farms are the type of farms that have historically employed Mexican-born farmworkers. That these large labor farms are declining across all destination types while the number of Mexican-born farmworkers living in Other States is increasing could be an indication that farms in certain commodity sectors that have historically employed a small number of primarily native-born workers are now hiring Mexican-born workers. For example, the dairy industry in Wisconsin, which has historically been made up of small farms that might employ between one and four native-born workers, are now employing Mexican-born workers (Harrison, Lloyd, and O'Kane 2009).

The shift from seasonal to more permanent employment is another emerging trend in farm labor in the United States. Table 6.1 reports the mean percentage of farmworkers by county that are employed as seasonal workers, defined as workers who are employed 150 or days less each year, and long-term workers. From 2002 to 2007, the proportion of farmworkers across all destinations who were seasonal declined. The greatest declines were in the Other States. At the same time, the proportion of farmworkers with long-term employment increased, with the greater increases in Other States. This shift from temporary to more long-term employment in Other States has important implications for the settlement patterns of Mexican-born farmworkers. For decades, Mexican-born migrant farmworkers have traveled around the United States working primarily in the harvest of fruits and vegetables. While Mexican-born immigrants traveled outside of traditional settlement states as part of these longstanding migration patterns, there was very little settlement of Mexican-born immigrants in these states. It is expected that this increase in demand for more long-term farm labor in new destinations will impact the
settlement of Mexican-born immigrants as their work in agriculture keeps them more tied to a particular community.

**Geographic Distribution of Farm Labor Demand**

The demand for hired farm labor is not evenly distributed across the United States but tends to be geographically concentrated. Figure 6.1 shows the percentage of farms with any hired labor in 1997 and 2007\(^\text{17}\). In 1997, the counties with the highest percentage of farms with hired labor were located mainly along the West Coast and throughout the Southwest. In that year, there were also counties with high demand for hired workers in the Mountain States region, parts of the Midwest, the Mississippi Delta region, and along the Atlantic Coast. Between 1997 and 2007, the demand for hired farm labor declined dramatically as is evident from the map of the percentage of farms in a county with any hired labor in 2007. This decline was not only dramatic in its magnitude but also in its geographic pattern as the demand for farm labor declined in all regions of the United States. The decline in the percentage of farms with hired labor was greatest in the Southern region of the United States. While these maps illustrate the overall decline in the demand for hired labor, it is unclear exactly how the geographic concentration of the demand for hired farm labor changed over time.

\(^{17}\) In the remainder of the analysis I focus on change from 1997 to 2007 rather than the change from 2002 to 2007 because the longer time interval will better capture the structural trends in the farm sector. The 1997 data was used in Table 5.1 because the data was available for a more detailed analysis of farm labor in 1997.
Figure 6.1 The geographic concentration of the demand for hired farm labor, 1997 and 2007
To better address the geographic concentration of the demand for hired labor, I use spatial descriptive statistics and maps to illustrate the patterns of change over time. Specifically, I use the Moran’s I statistic and Local Indicators of Spatial Association (LISA) maps to measure the change in geographic concentration. The Moran’s I statistic is a measure of global spatial autocorrelation and indicates how much overall geographic concentration or dispersion there is among areal units. This measure ranges from -1 to 1 with positive numbers indicating concentration and negative numbers indicating dispersion. The LISA map shows county clusters in red where the percentage farms with hired farm labor is high in both the county and those counties adjacent to it (High-High), dark blue where the percentage of farms with hired labor is low in both the county and its neighbors (Low-Low), light blue where the percentage of farms with hired farm labor is low in the county but high in surrounding counties (Low-High), and pink where it is high in the county but low in adjacent counties (High-Low). The first two categories capture geographic clusters or areas where counties have similar values with one another and the last two categories are spatial outliers.

In 1997, the Moran’s I statistic for the percentage of farms with hired labor was .372 indicating that there was moderate global spatial association between counties (Figure 6.2). In that year, there were several large geographic clusters of counties with high percentages of farms with hired labor. Surprisingly, the largest of these clusters was in the Great Plains region, which extended from North Dakota and Minnesota down to Kansas. There were other large geographic clusters in California, West Texas, Idaho-Nevada-Utah, Washington state, the Mississippi Delta region, Kentucky, and North Carolina and Virginia. Conversely, there were also geographic clusters where the
Figure 6.2 Spatial Descriptive Statistics for the Demand for Hired Farm Labor, 1997 and 2007
percentage of farms with hired labor was very low. These were located in parts of the Midwest and Northeast (Michigan, Ohio, and Pennsylvania), the Midwest (Missouri, Oklahoma, and Texas), and the East South Central region (Tennessee, Alabama, Georgia, and South Carolina). It is clear from this analysis that in 1997, the demand for hired farm labor was clustered in several regions throughout the United States including both traditional Mexican-born farmworker settlement states and new destinations.

By 2007, the Moran’s I statistic had increased to .535 which implies that the overall spatial association of the percentage of farms with hired labor had increased meaning that in general, the percentage of farms with hired labor in a county was more similar to its neighboring counties than in 1997. There were also changes in the geographic clustering of counties based on the demand for hired farm labor. In 2007, the largest cluster of counties with a high demand for hired labor was in California and included all of the southern counties in that state and continued into the border region of Arizona. The cluster of counties in the Great Plains region, which was the largest cluster in 1997, was considerably smaller in 2007. Again, there was a sizable cluster of counties with high demand for hired labor in the southern portion of Idaho and northern Nevada. There were also large geographic clusters of counties with high demand for hired farm labor in the Mississippi Delta region, North Carolina, and Washington State. By 2007, there were fewer geographic clusters of counties where the percentage of farms with hired labor was low. Most noticeably, the large cluster from Missouri to Texas is smaller, as is the cluster in the East South Central region. There is still a sizeable number of counties in Pennsylvania, Ohio, and West Virginia where the demand for hired farm labor is low. From 1997 to 2007, the geographic concentration of the demand for hired
farm labor in the United States increased. While the spatial clustering of counties with high demand for hired farm labor remained high in California and parts of Texas, there were also large clusters that emerged in new destination areas including the Pacific Northwest, the Great Plains, and the South regions.

From the preceding analysis, it is clear that there has been an overall decline in the demand for hired farm labor. This change in the percentage of farms with hired labor has been most pronounced among farms that employ 10 or more workers. Although the overall number of farms and farm workers declined from 2002 to 2007, there has been an increase in the number of farmworkers who are employed long-term in new destinations. Spatial descriptive statistics indicate that the demand for hired farm labor has become more geographically clustered over time and that there exist spatial regimes or clusters of counties with high demand for hired farm labor and also clusters of counties with low demand for hired labor. These geographic clusters of counties with high demand for hired labor are located in both traditional settlement states and new agricultural destination states.

These results are not only consistent with the agricultural restructuring literature reviewed in Chapter 2 but can also inform that literature about emerging trends in the geography of farm labor. In his foundational work on the social origins of farming systems in the United States, Pfeffer (1983) theorized that different farming systems developed mainly because of the availability of labor in those regions. An industrial style agriculture developed in California because of the access to immigrant labor, sharecropping developed in the South because of the historical legacy of slavery, and family labor farming developed in the Midwest where access to large supplies of labor was
limited. Not surprisingly, significantly large clusters of counties with high demand for hired labor are located in California and the South, but what is surprising are the clusters of high labor demand in the Midwest (a region historically dominated by family labor farms). Other research has shown that the industrial style of livestock production, which until a few years ago was mainly found in California, has now spread to other parts of the country where land and labor prices are cheaper (Cross 2006). These new patterns in livestock production are most likely driving the expansion of labor clusters in Southeastern Idaho and Northern Nevada from 1997 to 2002. The production of labor-intensive commodities in new regions of the United States is also sustaining clusters of high farm labor counties in the South and Northwest. Although these findings are consistent with the literature on agricultural restructuring, they do not explain the relationship between agricultural restructuring and hired farm labor. The extent to which regional variations in the structure of agriculture are related to regional variations in the demand for hired farm labor is the focus of the remaining analyses.

**Agricultural Restructuring**

The agricultural industry in the United States has undergone considerable restructuring in recent decades. Since the 1950s, the number of farms has declined dramatically as the average farm size has more than doubled, many farm households now rely on earnings from off-farm employment to maintain their economic viability, the reliance on family labor has largely been replaced by the reliance on hired labor, livestock and poultry production has become consolidated on large confinement feed operations (CFOs), and the ownership structure of agriculture has changed as many farms
that were once family-owned have become corporately owned. In general, the farm sector in the United States has become more industrial in nature, which is part and parcel of restructuring. This stage of the analysis focuses on the relationship between agricultural restructuring and changes in the demand for hired farm labor. This section begins with an analysis of descriptive statistics on the structure of agriculture by destination type and over time. Destination-specific multivariate regression models of change in the demand for hired labor and the structure of agriculture are then presented.

**Descriptive analysis**

Descriptions of the indicators of agricultural restructuring that are used in the analysis are presented in Table 6.2. "Hired farm labor" refers to the percentage of farms with any hired labor in a county. There are several variables that are used to capture changes in the size and scale of production. "Large acre" is the percentage of farms in the county with 1,000 or more acres, "large sales" is the percentage of farms in the county with more than $250,000 in annual sales, "large cattle" is the percentage of farms with livestock in the county that have more than 500 cattle or calves, and "average size" which is the average size (in acres) of farms in the county. Given the number of farmers who work off-farm, I include the variable "principal occupation" which is the percentage of farms where farming is the principal occupation of the operator. Average age is the average age of operators in the county. The final two variables represent different types of ownership systems. The first is "family farms" and is the percentage of farms that are family or individually owned while the second, "corporate farms," is the percentage of farms that are owned by a corporation. These variables reflect different dimensions of the
structure of agriculture including the size and scale of production, operator characteristics, and different types of farm ownership.

Table 6.2 reports the means and standard deviations for the demand for hired labor and the restructuring variables outlined above. Because of variation in the relative size of farm sectors by county, the statistics in this table are weighted by the number of farms in each county, which was computed as the percentage of all farms in the county. By applying these weights, a county with a large agricultural industry will have a greater overall impact on the averages and standard deviations than a county with relatively little agricultural activity. From 1997 to 2007, the average percentage of farms with hired labor for all counties declined from 32 to 21 percent. There were similar declines in California and Texas and in Other States. Increases in farm size and the scale of production are expected to be positively related to the demand for hired labor. The percentage of large acre farms also declined slightly with the greatest declines in California and Texas. The percentage of large sales farms increased across all destination types with the greatest increases in Other States. In 1997, large cattle farms were more prevalent in California and Texas, however, over the study period the percentage of large cattle farms in Other States increased from 1.9 to 3 percent. In California and Texas, the percentage of large cattle farms decreased slightly from 1997 to 2007. Overall, the average farm size declined across all destination types. Farm size and the intensity of production are expected to be important predictors of the demand for hired farm labor because they act as proxies for industrialization of the farm sector. However, the relationship between farm size and intensity of production is not always intuitive.
### Table 6.2 Hired Labor and Agricultural Restructuring Variables, 1997-2007

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>All counties</th>
<th>Means (S.D.)</th>
<th>CA/TX counties</th>
<th>Other States’ counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hired farm labor</td>
<td>Percentage of farms with any hired labor</td>
<td>32.08</td>
<td>21.85</td>
<td>32.28</td>
<td>22.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.17)</td>
<td>(7.30)</td>
<td>(12.91)</td>
<td>(10.35)</td>
</tr>
<tr>
<td>Large acre</td>
<td>Percentage of farms with more than 1,000 acres</td>
<td>8.03</td>
<td>7.89</td>
<td>8.97</td>
<td>8.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11.41)</td>
<td>(10.48)</td>
<td>(10.47)</td>
<td>(9.69)</td>
</tr>
<tr>
<td>Large sales</td>
<td>Percentage of farms with more than $250,000 in</td>
<td>7.31</td>
<td>9.53</td>
<td>6.69</td>
<td>6.97</td>
</tr>
<tr>
<td></td>
<td>annual sales</td>
<td>(6.94)</td>
<td>(8.83)</td>
<td>(8.23)</td>
<td>(9.02)</td>
</tr>
<tr>
<td>Large cattle</td>
<td>Percentage of farms with more than 500 cattle or</td>
<td>2.33</td>
<td>3.26</td>
<td>4.87</td>
<td>4.71</td>
</tr>
<tr>
<td></td>
<td>calves</td>
<td>(4.12)</td>
<td>(4.99)</td>
<td>(7.40)</td>
<td>(7.99)</td>
</tr>
<tr>
<td>Average size</td>
<td>Average number of acres per farm</td>
<td>427.37</td>
<td>416.40</td>
<td>510.65</td>
<td>474.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(781.54)</td>
<td>(702.04)</td>
<td>(1,061.45)</td>
<td>(1,031.19)</td>
</tr>
<tr>
<td>Principal occupation</td>
<td>Percentage of farms where farming is the principal</td>
<td>47.11</td>
<td>45.04</td>
<td>43.04</td>
<td>42.51</td>
</tr>
<tr>
<td></td>
<td>occupation of the operator</td>
<td>(12.23)</td>
<td>(8.56)</td>
<td>(10.17)</td>
<td>(7.81)</td>
</tr>
<tr>
<td>Average age</td>
<td>Average age of primary operators</td>
<td>53.98</td>
<td>57.09</td>
<td>55.90</td>
<td>58.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.15)</td>
<td>(1.98)</td>
<td>(1.63)</td>
<td>(1.54)</td>
</tr>
<tr>
<td>Family farms</td>
<td>Percentage of farms that are family or individually</td>
<td>86.78</td>
<td>86.48</td>
<td>85.71</td>
<td>85.87</td>
</tr>
<tr>
<td></td>
<td>owned</td>
<td>(6.02)</td>
<td>(5.85)</td>
<td>(7.60)</td>
<td>(7.04)</td>
</tr>
<tr>
<td>Corporate farms</td>
<td>Percentage of farms that are owned by a corporation</td>
<td>4.05</td>
<td>4.33</td>
<td>3.57</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.84)</td>
<td>(3.58)</td>
<td>(3.30)</td>
<td>(3.58)</td>
</tr>
</tbody>
</table>

N=3,052 (CA/TX) 311 (Other States) 2,741

Note: Statistics in each year weighted by the number of farms in each county.
Operator characteristics are also indicators of the structure of the agricultural industry in a county. The percentage of farms where farming is the principal occupation in a county is expected to be positively related to the demand for hired labor because part-time farming tends to be less labor intensive than full-time farming. The average percentage of farms for which farming is the principal occupation declined from 47 to 45 percent for all counties. The percentage of principal operators was slightly higher in Other States. The average age of operators should also be related to the demand for hired labor. From 1997 to 2007, the average age of operators increased across all destinations by about 4 years. On average, farmers tend to be older in California and Texas.

Different types of farm ownership systems are related to the industrialization of production in a county. Despite decades of restructuring, the farm sector in the United States is still dominated by family or individually owned farms. In 1997, the average percentage of farms that are family or individually owned for all counties was 86 percent and there was relatively no change from 1997 to 2007. The average percent of family or individually owned farms was slightly higher in Other States than in California and Texas. The average percentage of farms that are corporately owned for all counties was around 4 percent in both 1997 and 2007. There is a higher percentage of corporately owned farms in Other States than in California and Texas.

**Multivariate analysis**

Agricultural restructuring is a dynamic process by which the organization of food and fiber production is reorganized. Because this process involves change over time, analytical models of agricultural restructuring must also by dynamic. To account for this,
Table 6.3 First-Difference Regressions of the Percentage of farms with Hired Labor by Indicators of Agricultural Restructuring

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Counties</th>
<th></th>
<th>CA/TX Counties</th>
<th></th>
<th>Other States Counties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>(S.E.)</td>
<td>Coefficient</td>
<td>(S.E.)</td>
<td>Coefficient</td>
<td>(S.E.)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-8.239***</td>
<td>(.273)</td>
<td>-6.336***</td>
<td>(.813)</td>
<td>-8.623***</td>
<td>(.290)</td>
</tr>
<tr>
<td>Large acre</td>
<td>.033</td>
<td>(.047)</td>
<td>.384**</td>
<td>(.128)</td>
<td>.033</td>
<td>(.052)</td>
</tr>
<tr>
<td>Large sales</td>
<td>.227***</td>
<td>(.032)</td>
<td>-.433**</td>
<td>(.142)</td>
<td>.248***</td>
<td>(.033)</td>
</tr>
<tr>
<td>Large cattle</td>
<td>-.015</td>
<td>(.049)</td>
<td>.001</td>
<td>(.095)</td>
<td>.017</td>
<td>(.057)</td>
</tr>
<tr>
<td>Average size</td>
<td>.001</td>
<td>(.001)</td>
<td>.001</td>
<td>(.001)</td>
<td>.001</td>
<td>(.001)</td>
</tr>
<tr>
<td>Principal occupation</td>
<td>.298***</td>
<td>(.017)</td>
<td>.321***</td>
<td>(.061)</td>
<td>.289***</td>
<td>(.018)</td>
</tr>
<tr>
<td>Average age</td>
<td>-.605***</td>
<td>(.085)</td>
<td>-.524*</td>
<td>(.266)</td>
<td>-.592***</td>
<td>(.089)</td>
</tr>
<tr>
<td>Family farms</td>
<td>-.292***</td>
<td>(.043)</td>
<td>.038</td>
<td>(.130)</td>
<td>-.330***</td>
<td>(.045)</td>
</tr>
<tr>
<td>Corporate farms</td>
<td>.121</td>
<td>(.079)</td>
<td>.565*</td>
<td>(.224)</td>
<td>.066</td>
<td>(.085)</td>
</tr>
<tr>
<td>Adjusted R-Square</td>
<td>.156</td>
<td></td>
<td>.288</td>
<td></td>
<td>.151</td>
<td></td>
</tr>
<tr>
<td>N=</td>
<td>3,015</td>
<td></td>
<td>308</td>
<td></td>
<td>2,707</td>
<td></td>
</tr>
</tbody>
</table>

Note: Regression are weighted by the number of farms in each county
I use first-difference regression models to measure the relationship between changes in the demand for hired farm labor and agricultural restructuring. In first difference regressions, panel data from one time period are subtracted from panel data of another time period to model the change in the variable over time. One advantage to this type of regression modeling is that when all of the variables are differenced it cancels out any unobserved heterogeneity in the model as well as error caused by multicolinearity between the predictor variables (Anderson and Hsiao 1981; Arellano and Bond 1991; Blundell and Bonds 1998; Holtzeakin, Newey, and Rosen 1988; Hsiao 2003). In addition, spatial autocorrelation between geographic units is extremely low when modeling the change in a variable making spatial models that account for it unnecessary.

In this analysis, the dependent variable is the difference between the percentage of farms with hired labor in 2007 and 1997. The predictor variables are also differenced to account for changes in the structure of agriculture from 1997 to 2007. In this section, I use three first-differenced multiple regression analyses to model the relationships between the changing demand for hired farm labor and agricultural restructuring. The first model includes all counties in the United States, the second model includes only counties in California and Texas, and the final model includes only counties in new destination states (Table 6.3). The rationale behind modeling the destination types separately is to observe whether the effects of agricultural restructuring on the demand for changes in the demand for hired farm labor differ by destination type.

For all counties in the United States, change in operator characteristics and farm ownership structure had the greatest impact on changes in the demand for hired labor. Of the different indicators of change in farm size, only the change in the percentage of large
sales farms was significantly related to change in the demand for hired labor. According to the model, a one percent increase in the percentage of farms with sales more than $250,000 would increase the demand for hired labor by .22 percent. Surprisingly, change in the percent of large acre farms, change in the percentage of large cattle farms (more than 500 cattle or calves), and the change in the average farm size were not significantly related to the change in the demand for hired farm labor in this model.

As mentioned above, changes in operator characteristics and systems of ownership had the largest influence on the increasing demand for hired labor. The percentage of farms where farming is the principal occupation of the farm operator was positively related to the change in demand for hired labor and was statistically significant. The model indicates that a 10 percent increase in this variable would increase the demand for hired labor by roughly 3 percent. Change in the average age of operators had a large negative effect on the demand for hired labor. For every year increase in the average age of operators, the demand for hired labor decreases by over .60 percent. There is also a negative relationship between change in the percentage of farms in a county that are family or individually owned and the increasing demand for hired labor. For the all counties model, change in the percentage of farms that are corporately owned was positively related to demand for hired labor, but this variable was not statistically significant. The adjusted r-squared for this model is .156 indicating a modest explanatory power.

The final research question addressed in this chapter asks “what differences are there by destination type in how agricultural restructuring is related to the demand for hired farm labor?” To address this question, I model the relationship between the change
in the demand for hired farm labor and agricultural restructuring in CA/TX and Other States separately (Table 6.3). In the California and Texas model, the change in farm size and the scale of production have a greater influence in the demand for hired labor than they did in the all counties model. In counties in California and Texas, change in the percentage of large acre farms was positively related to change in the demand for hired labor. This relationship is statistically significant. Change in the percentage of large sales farms is negatively related to the demand for hired farm labor, a reversal from the all counties model. These findings indicate that there are differences in the ways that agricultural restructuring in traditional settlement states is related to the demand for labor than in the all counties model. In general, these differences show that in California and Texas change in the size of farms has a greater impact on the demand for hired labor than change in the intensity of production.

Change in the percentage of farms where farming is the principal occupation has a substantial effect on change in demand for hired labor to the point that a one percent increase in this variable increases the demand for hired labor by .32 percent. Similar to the All County model, an increase in the average age of operators in the county decreases the demand for hired labor; however, this effect was not as strong as in the all county model. Change in the percentage of farms that are family or individually owned was positively related to the demand for hired labor, but this relationship was not statistically significant. Finally the change in the percentage of farms that are corporately owned has a large impact on the increasing demand for hired labor in California and Texas where a ten percent increase in this variable would increase the demand for hired labor by nearly
six percent. The adjusted r-squared for this model increased substantially to .288 from the All Counties model indicating better explanatory power.

The Other States model is very similar to the All Counties with just a few exceptions (Table 6.3). First, the change in the percentage of large sales farms has a greater positive relationship with the change in the demand for hired labor in this model. The change in the percentage of farms where farming is the principal occupation has a weaker relationship in the Other States model. The change in the average age of operators is again negatively related to the demand for hired labor. Finally, the change in the percentage of farms that are family or individually owned has a greater negative impact on the demand for hired labor than in the all counties or in just California and Texas. The change in the percentage of corporate farms was not statistically significant. The adjusted r-squared was lowest for this model meaning that the overall explanatory power was weakest for the Other States specific model.

These findings from the regression analysis show that many aspects of agricultural restructuring are related to the changes in the demand for hired farm labor and that there are differences in the ways that changes in the farm sector influence the demand for hired labor by destination type. While changes in farm size and scale do not have a great effect on the demand for hired labor in Other States, they are significant in California and Texas. Changes in operator characteristics and systems of ownership greatly impact the demand for labor in both destinations.

Again, the findings in this analysis are consistent with the literature on agricultural restructuring discussed in Chapter 2. For instance, the decline in the total number of farms in recent decades has led to the consolidation of production in the farm
sector. The impact of this consolidation on the demand for hired labor is captured in the first-difference models through the various indicators of size and scale. It is noteworthy that these findings show that there is geographic variation in the relationship between changes in the size and scale of production and hired farm labor. This is most evident in the relationship between the change in large sales farms and the demand for hired labor, which is negative in California and Texas and positive in Other States.

Conclusion

Food and fiber production in the United States has undergone dramatic change in recent decades and this change continues today. Overall, the farm sector has become segmented into small-scale farms that receive only a portion of their household income from farming and large-scale producers that have adopted an industrial style of production. While the overall demand for hired farm labor has declined in recent years, new trends have emerged that are reshaping the demand for hired farm labor throughout the United States. One trend has been the declining proportion of farms that employ 10 or more workers and the growth of smaller labor farms. Another emerging trend is the shift from seasonal employment to more long-term employment, especially in new agricultural destinations. This change from short-term employment to long-term employment should have a direct effect on the geographic distribution of Mexican-born farmworkers as workers that might have been seasonal migrants in the past are permanently settling in new destinations.

The geographic distribution of the demand for hired farm labor has also been changing. Spatial descriptive analysis shows that the demand for hired labor in
agriculture has become more consolidated in recent years and that there are large geographic clusters where the demand for hired labor is high. These clusters are found both in traditional agricultural settlement areas and, more importantly, in new agricultural destination states. Furthermore, there were fewer geographic clusters where the demand for hired farm labor is lower in 2007 than in 1997.

Agricultural restructuring in both traditional settlement areas and new agricultural destinations is increasing the demand for hired labor. However, some indicators of restructuring have differential effects on hired labor depending on the destination. For example, changes in the size and scale of farms in the county are more closely related to changes in the demand for hired labor in California and Texas than they are in Other States. Similarly, changes in ownership system have a greater effect on the changing demand for hired labor in Other States than in California and Texas. It is these differences in farm structure by destination type that not only help to explain the variation in demographic, social, and economic characteristics of Mexican-born farmworkers by destination observed in Chapter 4, but also the different labor market outcomes discussed in Chapter 5. For instance, migrant and seasonal farmworkers are generally younger than permanent workers (Carroll et al. 2005) and their earnings tend to be considerably lower (Martin 2003b).

This analysis focuses on the demand for all hired labor and does not address the demand for Mexican-born farmworkers specifically. Given that Mexican-born farmworkers make up such a large portion of the overall agricultural workforce, and that the number of Mexican-born farmworkers in Other States has grown dramatically over the last several decades, it can be assumed that Mexican-born immigrants are meeting a
large part of the increase in the demand for hired farm labor caused by agricultural restructuring in new destinations.
Chapter 7

Conclusions

The demand for agricultural labor has been vital to the history of Mexican migration to the United States. Since the early 1900s, many sectors within the agricultural industry have relied on immigrant labor. This relationship was solidified with the establishment of the Bracero Program in 1942, which over the subsequent twenty years, brought millions of Mexican laborers to the United States to work in agriculture. Even with the enactment of strict immigration reform in 1986, there were special provisions made for farmworkers. There has long been a strong relationship between Mexican migration and agricultural labor in the United States. Despite this strong relationship, research that situates farmworkers within broader patterns of contemporary trends in immigration is lacking. For instance, in recent years, there has been a dramatic shift in the geographic distribution of Mexican immigrants in the United States. Historically, these immigrants have settled primarily in California, Texas, Arizona, Florida, and Illinois, but recently Mexican immigrants have begun settling in new destinations outside of the traditional settlement states. Although the growth of Mexican immigrants in new destinations has received considerable research attention, empirical studies focusing on subsets of this population have been limited and there have been even fewer studies focusing specifically on agricultural workers in new destinations. This research has filled that gap in the new destinations literature by providing a thorough analysis of the changing geographic distribution of Mexican-born farmworkers, the
impact of living in a new destination on earnings, and the structural changes in the agricultural industry that are creating demand for hired farm labor in new destinations.

Key Findings

The Changing Geographic Distribution of Mexican-Born Farmworkers

In Chapter 4, data from the 1980, 1990, 2000 Public-Use Microdata Samples (PUMS), and 2005-07 American Community Survey (ACS) extracted from the Integrated Public Use Microdata Samples (IPUMS) database were used to measure changes in the geographic distribution of Mexican-born farmworkers since 1980. The analysis showed that there has been a substantial shift in the geographic distribution of this population. Between 1980 and 2007, the percent of Mexican-born farmworkers living in California and Texas declined from nearly 80 percent to just over 50 percent. While much of this redistribution was between states that already had a large share of Mexican-born farmworkers in 1980, there were also several new destination states such as North Carolina, Georgia, and Wisconsin that emerged as destination states for immigrant farmworkers. There was also a substantial change in the demographic composition of the Mexican-born farmworkers living in other states. In 1980, these workers were younger, more likely to be male, less likely to be married, and less likely to live with a relative than those in California and Texas but by 2007 these differences by destination type had greatly reduced. Similarly, differences in immigration-related characteristics by destination type also declined as the share of farmworkers in new destinations that are U.S. citizens increased. Finally, the economic well-being of the population living in new
agricultural destinations changes markedly during this time period. The greatest improvement in well-being was the declining share of Mexican-born farmworkers in new destinations experiencing extreme poverty (annual income less than one-half the poverty line). In general, differences between the social and economic characteristics of Mexican-born farmworkers in traditional settlement states and those living in new destinations declined as the population living in new destinations increased.

The Changing Earnings Inequalities of Mexican-Born Farmworkers

In Chapter 5, data from the 1980, 1990, 2000, and 2005-07 PUMS files were used to model changes in the earnings inequalities of Mexican-born farmworkers in the United States by destination type using multivariate regression and regression decomposition techniques. The purpose of this chapter was to explain changes in the economic well-being of Mexican-born farmworkers by destination type over time. These findings showed that over time, the relationship between earnings and destination type reversed with hourly wages initially higher in California and Texas but then declining at a faster rate than hourly wages in Other States. Decomposition analysis revealed that these changes in earnings were more attributable to changes in the returns to workers characteristics than to changes in the population composition.

Agricultural Restructuring and the Demand for Hired Farm Labor

In Chapter 5, county-level data from 1997, 2002, and 2007 Censuses of Agriculture were used to analyze the relationship between the demand for hired farm
labor and agricultural restructuring. The purpose of this chapter was to identify the structural changes in agriculture that are increasing the demand for hired farm labor and to identify variations by destination type. The results showed that while the demand for hired farm labor has declined in recent years, there are still geographic clusters in both traditional settlement states and new destinations where the demand for hired farm labor is quite high. Further analysis revealed that the demand for hired farm labor is related to changes in the structure of agricultural production and that there is variation in this relationship by destination type.

**Theoretical Implications**

There are several theoretical implications that can be drawn from this research. First, the findings from this analysis give support to several of the explanations advanced in Chapter 2 for why immigrants are bypassing traditional gateway cities and settling in new destinations. For instance, the higher proportions of recent arrivals working in new destinations rather than in traditional settlement states supports the network saturation theory because recent arrivals are being deflected from traditional gateway destinations. This was evidenced in the finding from Chapter 4 that Mexican-born farmworkers in new destinations that recently moved are more likely to have moved from either one of the other states or from abroad. That the citizenship status of Mexican-born farmworkers in new destinations increased during the 1990s provides evidence for the immigration policy hypothesis, which posits that immigrants are moving to new destinations because of amnesty provisions and increased border enforcement as a result of IRCA. Of the
different explanations for the growth of immigrant settlement in new destinations, this analysis most supports the industrial restructuring hypothesis which posits that changes in the structure of production are increasing the demand for workers in new destinations as indicated by the findings in Chapter 6, suggesting that agricultural restructuring is related to an increase in the demand for hired labor in new destinations provides evidence for the industrial restructuring hypothesis.

Furthermore, the findings of this research support the theory of cumulative causation in two important ways. First it shows that the initial migrants to a destination are more socially and economically selective than later migrants which was evidenced by the fact that the demographic, immigration-related, and economic characteristics of Mexican-born farmworkers in new destinations changed dramatically as the share of all Mexican-born farmworkers living in those states increased. Second, this research shows that over time migration streams become cumulative in that the costs of migration for later migrants to a destination are less as they are able to draw on their social networks for resources. The finding that the farmworkers in new destinations were less like to like with a relative in 1980 but that by 2007 farmworkers in new destinations were increasingly living with nuclear and extended family supported this.

Policy Implications

The results from this study have the potential to inform public policies regarding immigration, farm labor, and rural poverty. Once again, immigration reform has become part of the national agenda, and as with other immigration legislation, there has been considerable debate about the status of farmworkers. The Bracero Program, arguably the
largest single facilitator of migration from Mexico during the 20th century, was intended to prevent labor shortages in the U.S. agricultural industry during World War II. This program persisted until 1964 when the immigration system of the United States was restructured. The Immigration Reform and Control Act (IRCA) of 1986, designed to limit the flow of undocumented immigration to the United States, made provisions for farmworkers through the Special Agricultural Workers (SAW) program. Nearly two million additional Mexican-born immigrants were granted amnesty under this program. Currently, there is proposed legislation to create a new program focused on farm labor that has substantial ramifications for comprehensive immigration policy in the United States.

The Agricultural Job Opportunities, Benefits, and Security Act (AgJOBS), was initially proposed by U.S. Senators Edward Kennedy and Larry Craig, and U.S. Representatives Howard Berman and Chris Cannon in 2003 with the intent of providing a path for legal status to undocumented farm laborers (Martin 2003a). This bipartisan legislation tries to balance the needs of agricultural employers while preventing the exploitation of immigrant laborers. Although this legislation has not been signed into law at that time, there are currently versions of AgJOBS in the legislative process in both the U.S. Senate and U.S. House of Representatives. AgJOBS has two main parts. The first would provide undocumented immigrants working in agriculture with legal status to work in the United States first through temporary resident status and later through legal permanent residence (LPR) status. The second part would modify the current H2-A workers visa program making it less costly for employers.
The findings carry several implications for the development of an agricultural labor and immigration policy, such as AgJOBS, in several ways. The first is the finding that in recent decades Mexican-born farmworkers have become a geographically diverse population. This dispersion will affect the transportation cost reimbursement requirement for employers that was part of the H2-A worker program and has also been incorporated into AgJOBS. Another assumption of the proposed legislation is that most undocumented farmworkers are seasonal workers. While a larger proportion of farmworkers are employed temporarily or seasonally, the findings in this research indicate that the demand for long-term workers is increasing as the demand for seasonal workers is actually declining.

Mexican-born farmworkers are among the most marginalized groups in the United States and the findings from this study can help inform public policies designed to mitigate the relatively high poverty rates and low Public Assistance receipt among this population. One reason that Public Assistance receipt might be low among immigrant farmworkers is that there are other federal and state programs as well as nonprofit organizations that specifically target migrant farmworkers and their families, such as the Migrant Education Program (MEP), Migrant Head Start, Migrant Health Centers, and the Food Stamp Program which includes a special provision for farmworkers. These resources are more likely to be located in areas with long histories of migrant farmworkers and may be lacking in new agricultural destinations. However, knowing how the migratory and settlement patterns of Mexican-born farmworkers are changing is important for determining the appropriate location for these resources.
Future Research

As this research has shown, there continues to be a strong relationship between farm labor and Mexican migration to the United States and further research is needed in this area. Further research into the characteristics of farmworkers in new verses traditional settlement states using more detailed data from the National Agricultural Workers Survey (NAWS) could possibly reveal more nuanced distinctions between the two groups, which might better explain the differences in earnings and poverty. Also, using a comparative case-study approach to study the labor dynamics of a specific commodity found in both new and traditional settlement states (e.g. the dairy industry) could also illuminate ways that the structure of agriculture is related to labor across different destinations.

Future research is also needed into the specific mechanisms whereby Mexican-born immigrants find employment in new destinations. The analysis in Chapter 4 touched on the role of social networks in establishing migration streams to new agricultural destinations, but further research on the specific types of networks and the ways that information is transmitted through these networks is needed. Labor recruitment also acts as a mechanism by which the geographic distribution of farm labor is changing. However, analyzing the institution of farm labor recruitment in new destinations was beyond the scope of this research.

The analysis in Chapter 6 on agricultural restructuring and the demand for hired farm labor could be extended in several ways. First, the analysis would benefit from having additional points of time, which could be accomplished by performing a multivariate analysis similar to the one presented in Chapter 6, using data from the 1987
to 1997 Census of Agriculture. Additionally, state-level data from the Farm Labor Survey would provide a more comprehensive measure of the demand for hired farm labor and could be combined with county-level data from the Census of Agriculture and analyzed using multi-level models.

Another area that deserves more attention is the occupational mobility of Mexican-born farmworkers in new destinations. Several studies have shown Mexican immigrants often use farm labor as a stepping stone into the broader U.S. economy (Kandel 2004; Martin 2002). Martin (2002) argues that this occupational mobility is closely tied to geographic mobility as farmworkers in rural areas move to urban centers to find nonfarm employment. While there have been a few studies that document Hispanic farmworkers in new destinations transitioning to other industries (Gozdziak and Bump 2004; Pfeffer and Parra 2009), more research needs to be done on this topic.

A final extension of this research would be to study the micro-level demand for agricultural labor by focusing on the characteristics of farms in new destinations that are hiring Mexican-born farmworkers. This type of analysis could help identify whether Mexican-born immigrants are employed in jobs that were previously filled by native-workers or if agricultural restructuring in new destinations is creating employment opportunities that were not previously available. Either way, a farm-level analysis would begin to answer the question of whether agricultural restructuring would be possible without access to low-wage immigrant labor.
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