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The great recession and its effect on authorized and unauthorized Mexican agricultural workers in the United States: Who settles in the U.S.?

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Abstract

Using the National Agricultural Workers Survey (NAWS) and binary logistic regression analysis, I determine the odds of settlement in the U.S. during the Great Recession (2008–2010) of authorized and unauthorized agricultural workers from Mexico who were in the U.S. long enough—and at the right time—to be interviewed by the NAWS. Both groups were more likely to settle in the U.S. during 2008–2010 than their counterparts during the pre-recession (2005–2007) suggesting that the economic crisis had deterred circular-return migration to Mexico and/or discouraged new immigrants from migrating to the U.S. during the recession. The odds of settlement of the two groups were also affected by region of settlement within the U.S. Authorized agricultural migrants interviewed in the Eastern, Midwestern, and Northwestern states were significantly *less* likely to settle in the U.S. than their counterparts from the reference state California. The long history of immigrant settlement in California and a largely year-round growing season probably accounts for this difference. Conversely, unauthorized migrants interviewed in the Northwestern, Midwestern, and Southeastern states were significantly *more* likely to settle in the U.S. than their unauthorized counterparts from California, suggesting major differences in settlement patterns of authorized versus unauthorized Mexican migrants, which could have major implications for farm labor availability in the future. A third model with region of origin of migrants within Mexico and a fourth model with demographic, human capital, and other variables are included to further determine odds of settlement in the U.S. of authorized and unauthorized agricultural migrants.

Keywords: unauthorized agricultural workers; return migration; Mexico; migrant settlement

1.0 Introduction

Unauthorized immigration to the U.S. has been a topic of concern during most of the twentieth century. This concern has been renewed during the twentieth-first century as a result of the 9/11 attacks and the Great Recession which commenced in 2008. Whenever economic conditions decline in the U.S., there is inevitably a backlash directed at unauthorized immigrants who are often seen as competing with native-born individuals for jobs and drawing from government programs. According to Warren and Warren (2013), 1.1 million unauthorized immigrants moved to the U.S. in 1999 while only 369,000 left the U.S. leaving a net accrual of over 700,000 unauthorized immigrants for that year. In contrast, by 2009, only

400,000 new unauthorized immigrants entered the U.S. and 560,000 left resulting in a negative flow of 160,000. Not surprisingly, given the proximity of Mexico and the differential in wages between the two countries, the majority of these unauthorized immigrants to the U.S. were Mexicans. However, while the number of unauthorized immigrants from countries other than Mexico remained comparable between 2007 and 2012, Mexican-born unauthorized immigrants declined from 6.9 to 6.0 million during that time period (Passell, Cohn, & Gonzalez-Barrera, 2012). Most of the decline of unauthorized migration was a result of decreased immigration to the U.S., not elevated rates of return to Mexico.

The decline of unauthorized agricultural workers seeking entrance to the U.S. due to the Great Recession has serious implications given the overreliance of U.S. agriculture on these workers. However, counterbalancing this decline in new arrivals is the increased numbers of unauthorized Mexicans who have settled permanently in the U.S. Whereas the majority of unauthorized Mexican migrants worked in agriculture and then returned to Mexico before the 1970s (Cornelius, 1981; Massey, 1986), since then Mexican migrants have moved into numerous occupations outside of agriculture and have stayed longer or have settled permanently in the U.S. (Durand, Massey, & Zenteno, 2001; Wampler, Chavez, & Pedraza, 2009).

The literature on the reasons for the permanence of Mexican immigrants is extensive. Some researchers claim that IRCA (The Immigration Reform and Control Act) provided legitimacy for some 2.7 million unauthorized immigrants living in the U.S., 75 percent of who were Mexican-born (Massey, Arango, Hugo, Kouaouci, Pellegrino, & Taylor, 1994). These individuals were then able to sponsor family members who also settled in the U.S. These migrant chains could then attract more unauthorized migrants, thus keeping the workers desired by employers. Enhanced border patrol during the 1990s and after 2001 made the cost of temporary or circular migration much higher (Massey & Riosmena, 2010; Cornelius, 2007). Instead of deterring would be unauthorized immigrants by tightening border patrol, many migrants have decided to stay in the U.S. longer to accrue the resources needed to pay coyotes for illegal border crossing (Alba, 2013). Some researchers have found that the recession of 2008 deterred individuals from returning to Mexico because they were unable to accrue as much capital as they had prior to the recession (Rendell, Brownell & Kups, 2011).

The purpose of this paper is to determine the predictors of unauthorized agricultural workers who settle permanently in the U.S. and those who circulate between Mexico and the U.S. between 2005 and 2012, which corresponds to a time period immediately before and after the Great Recession. There are several caveats in this research. Firstly, it is well known that the Great Recession of 2007–09 led to drastic reductions in unauthorized migration from Mexico (Warren & Warren, 2013; Passel et al., 2012). Thus, we may be dealing with different characteristics of migrants who came during the Great Recession. It may be that these migrants have greater connections to the U.S. or more resources than their counterparts who remain in Mexico and may be already predisposed to settlement. Secondly, many of the unauthorized workers may have left the U.S. during the Great Recession allowing those who stayed—arguably better skilled or with better connections—to be more represented in the study. Conversely, there is evidence that unauthorized migrants are staying longer to recoup lost wages or to avoid repaying crossing fees to arrive in the U.S. clandestinely (Rendell et al., 2011). I do not see these issues as major problems given that this paper is an exploration into some possible reasons

for the difference in settlement of unauthorized and unauthorized agricultural workers during the Great Recession.

To provide a more thorough picture of the settlement process, authorized Mexican agricultural workers are used as a comparison group. Specifically, this paper examines settlement behavior by region of origin in Mexico and of destination within the U.S. Secondly, demographic characteristics, human capital characteristics, connections to origin or destination, and types of agricultural jobs are examined to determine the odds of settlement in the U.S. The first section of the paper provides a short overview of agricultural labor migration to the U.S. The data and methodology are laid out in the second section. The third and fourth sections provide the descriptive and analytical analysis. The conclusion contains a brief discussion on immigration policy.

1.1 Changes in Source Areas of Immigrants

Mexican immigrants prior to the 1970s came from a select set of agricultural states in the West-Central part of Mexico including the main contributors: Guanajuato, Jalisco, Michoacan, San Luis Potosi, and Zacatecas. These states were the first to be connected by the railroads and the first to have U.S. capitalism disrupt agricultural production and create an itinerant labor force. As late as 1980–1984, 56.1 percent of Mexican immigrants to the U.S. hailed from these states (Marcelli & Cornelius, 2001). The Immigration Reform and Contract Act (IRCA) of 1986 legalized many farmworkers from the West-Central part of Mexico and allowed them to enter into more remunerative nonfarm labor (Martin, 2002) creating a vacuum which could only be filled by a further supply of unauthorized agricultural workers.

By the 1990s, the traditional sending states of West-Central Mexico were no longer the largest suppliers of agricultural labor (Taylor, Baucher, Smith, Fletcher, & Yunez-Naude, 2012). The source states of Mexican migrants had shifted to the Southern states (Durand et al., 2001). Southern Mexican states were poorer and more agricultural than their counterparts in the West-Central part of Mexico and were more likely to benefit from agricultural jobs in the U.S. The adoption of neoliberal policies after the economic troubles of the 1980s reduced subsidies to farmers in the Southern States of Mexico and initiated widespread outmigration (Popke & Torres, 2013). The North American Free Trade Agreement (NAFTA) had increased unauthorized labor from Mexico to U.S. agriculture by making it difficult for Mexican farmers to produce agricultural products competitively. U.S. farmers were heavily subsidized which allowed the U.S. a more competitive role. This forced Mexicans in agricultural areas of Southern Mexico to migrate for agricultural work in the U.S. (Luckstead, Devadoss, & Rodriguez, 2012). Mexico's attempt to stabilize the exodus of agricultural workers using subsidy programs may actually have funded migration to the U.S. Procampo was a federally funded program designed to help farmers in Mexico. Unfortunately, for many poor farmers, these cash transfers were too meager to provide real investment and in many poorer agricultural states of Southern Mexico have actually subsidized migration of individuals from households who received these subsidies (Cortina, 2014).

Regardless of whether unauthorized immigrants originated from the traditional or nontraditional source regions in Mexico, the implementation of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 which focused on border enhancement made it more costly for unauthorized Mexicans to come to the U.S. and this lengthened their stays or encouraged many to settle permanently

(Johnson & Trujillo, 2011). Additional immigration reform after the 9/11 tragedy and the Great Recession further increased the difficulties of clandestine movement across the border and further deterred migrants from returning to Mexico (Massey, Durand, & Pren, 2015).

1.2 Changes in Settlement Patterns in the U.S.

In 1980, California, Texas, and Illinois housed 83 percent of the Mexican immigrant population, whereas, by 2000, only 70 percent of Mexican immigrants resided in these states (Marcelli & Cornelius, 2001). Thus, the Mexican-born population has become much more dispersed over the past several decades. Massey et al. (1994) believes that much of this dispersion was a result of IRCA which allowed newly authorized migrants to seek employment in other regions of the country. Light and Von Scheven (2008) believe that this change was a result of competition in states such as California where migration density caused higher rents and lower wages than in other states. Anti-immigrant sentiment and an economic downturn in California in the early 1990s also funneled migrants into previously non-gateway states. Borjas and Katz (2007) found that the Mexican-born workforce had increased substantially in California between 1970 and 2000—increasing from 2.4 percent to 14.8 percent, respectively—and contributed to the competition for jobs and housing during the 1990s.

While migrant agricultural labor has a well-established history in the Northwest and Midwest-Great Plains that dates to the earlier part of the twentieth century (Mize & Swords, 2011) the settlement of Mexicans in the Southeast/East is a new phenomenon which was virtually unheard of until the 1980s. The Southeast has seen the greatest percentage growth of Mexicans since the 1990s (Farmer & Moon, 2011); a result of rapid economic and population growth as well as the need for labor in low-wage agriculture, manufacturing, and services in both nonmetropolitan and metropolitan areas. The U.S. has undergone a major agricultural restructuring which has converted family farms into corporate operations which are more akin to industry than agriculture. Industries which have undergone this restructuring such as the meat-processing and dairy industries have increasingly relied on immigrant labor (Cross, 2006; Godziak & Bump, 2004). In the Midwest/Great Plains aging and depopulation in rural areas have attracted low-wage labor from Mexico (Sanderson, 2014; Barcus & Simmons, 2013).

2.0 NAWS Agricultural Survey

The NAWS, sponsored by the U.S. Department of Labor, has been administered from 1989 to 2012. The NAWS database was constructed after the implementation of IRCA in 1986 to better track unauthorized agricultural workers. Prior to NAWS, data on agricultural workers was collected through the Current Population Survey which undercounted both authorized and unauthorized migrant workers. NAWS collects a random sample of agricultural workers in 43 states. Each year between 1,500 and 4,000 farmworkers are interviewed. The study collects data on country of origin, legal status, demographic characteristics, employment characteristics, and health conditions of agricultural workers. The total number of variables in the dataset is 320. To date approximately 59,000 migrants have been interviewed.

The random sample utilized by NAWS came from 498 Farm Labor Areas which consist of groups of neighboring counties. The survey uses multi-stage sampling to interview a random sample of agricultural workers in each fiscal year. The NAWS

is well known in U.S. agricultural settings and respected for its confidentiality, allowing employers and employees a high level of anonymity. In the 2009 round¹, 66 percent of employers agreed to interviews (NAWS, 2012). There is of course a strong possibility that the one-third of employers who refused the interview had a greater percentage of unauthorized migrants, but any study that attempts to document the behavior of clandestine populations is susceptible to this problem. Unfortunately, NAWS provides no information on the 33 percent of employers who refused to participate in the survey. However, the survey methodology is still valid and representative of the variety of agricultural enterprises in the U.S.

While the NAWS data necessarily has some flaws in capturing clandestine migrants, it is more representative than other databases which collect unauthorized migrant data such as convenience samples at worksites. U.S. census data underrepresents unauthorized populations while the Mexican census often misses migrants who have permanently settled in the U.S. Those who return to Mexico may have characteristics that are different from those who remain in the U.S. The MMP (Mexican Migration Project) is an excellent source of migrant data in the agricultural states of Mexico, but again most of the data is focused on return migrants. The Matricula Consular operates 53 sites in the U.S. and collects data on unauthorized migrants, but makes no attempt at a random sample. Lastly, the deportation database keeps detailed records on those deported but is not a random sample of all unauthorized migrants in the U.S.

Three interviewing cycles were employed to capture the seasonal variability of farm labor. Once contacted, employers provided a list of all farmworkers and interviewers drew a random sample from that list. The region, year, and cycle weights allow an analysis for multiple years and were included with the statistical database. From these data, two SPSS files were created: one with authorized Mexican agricultural workers and the second with unauthorized Mexican agricultural workers. Together, these two databases accounted for 71 percent of the 2005–12 samples and are the data that are used in this analysis. The remaining 29 percent were either U.S. born agricultural workers of all racial and ethnic groups or immigrants from countries other than Mexico and are not examined in this analysis.

Statisticians from the NAWs study suggest that statistical analyses include at least two years given low sample numbers in some regions for particular years and thus the decision to aggregate 2005–2012—eight years of data. The dependent variable was coded as 1 if the migrant was considered settled within the U.S. and 0 if the migrant was not settled in the U.S. Henceforth, migrants who have not settled in the U.S. will be referred to as nonsettlers. The NAWS database defines this category as workers who were absent from the U.S. for more than 28 consecutive days of the year and indicates that the worker is not permanently settled. This study makes no determination between circular migration between the U.S. and Mexico and permanent return migration to Mexico. Binary logistic regression² was performed to determine the likelihood of permanent settlement in the U.S.

¹ The NAWS does not provide estimates for each year of the percentage of employers who agreed to participate in the survey. The 2009 study is the latest one in which percentage responses were recorded. It is my assumption that 2009 was representative of the response rate for the 2008–2011 period.

² Binary logistic regression determines the odds ratio for an event occurring for a specific group against a reference group. Odds ratios above 1.0 indicate that the event has a higher likelihood of occurring than it does for the reference group. Odds ratios below 1.0 indicate a lesser probability of the event occurring.

according to a variety of demographic, human capital, and related variables.

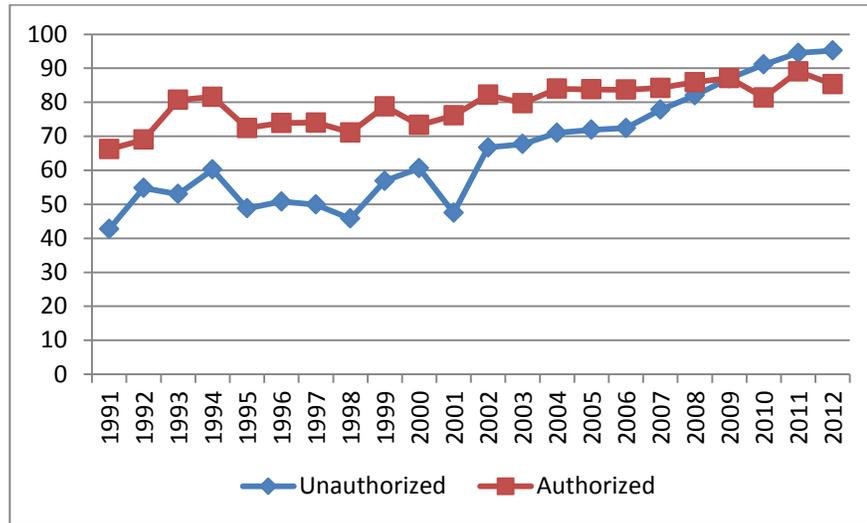
As stated previously, there are two caveats which have the potential to bias the results: (a) there was a reduction in the number of Mexican migrants who immigrated to the U.S. during the Great Recession; and (b) it is likely that a percentage of migrants returned to Mexico without ever being part of the NAWS survey. The following two studies have recently looked at the behavior of agricultural workers using NAWS data and the effect of the Great Recession and have noted these potential biases upfront. Fan, Gabbard, Pena, & Perloff (2014) examined seasonal migration of agricultural workers within the U.S. between 1989 and 2009 using NAWS data. They found that seasonal migration within the U.S. declined from about fifty percent in the early 1990s to less than 25 percent by 2009. Their methodology was similar to the one used in this study. The dependent variable was coded 1 if the worker was a migrant and 0 if a nonmigrant. The authors found that one-third of the decline in the migration rate within the U.S. between 1998 and 2009 was a result of demographic changes of the migrants and two-thirds a result of immigration policies and economic shocks. More specifically, Fan, Pena, and Perloff (2016) examined the effect of the Great Recession on the wages, hours worked, and receipt of bonuses for authorized versus unauthorized agricultural workers. Authorized workers received higher wages, worked longer hours and received more bonuses than their unauthorized counterparts during the Great Recession. The authors concluded that these results were due in part to the downturn of unauthorized immigration during the Great Recession and the possible return of unauthorized immigrants which decreased agricultural labor availability and benefitted authorized workers. In a perfect world we would be able to follow agricultural workers through space and time to gain a firm understanding on the myriad of factors that affect their movements. However, this is not feasible with such a mobile and clandestine labor force—for unauthorized agricultural workers. Thus, while not perfect, the NAWS data gives some insight into the processes that affect the agricultural labor force.

3.0 Increasing Settlement in the U.S. of Agricultural Migrants

Figure 1 displays the percentage of both documented and undocumented migrants who have settled in the U.S. from 1991 to 2012³. The data illustrate that documented agricultural migrants from Mexico were more likely to be settled in the U.S. prior to 2008 than their undocumented counterparts. Note that the percentage of each group of migrants that settled in the U.S. increased in the early 2000s. This is understandable for the undocumented migrants who would have been affected by changes in immigration policy that made it more difficult to cross the border and thus encouraged them to remain in the U.S., but should not have affected documented migrants in any substantial way. Examining the trends in settlement of the two groups from 2009 to 2012 reveals another interesting trend. The percentage of both documented and undocumented agricultural workers that were settled in 2009 were the same—about 80.0 percent. However, after 2008, unauthorized settlement increased each year, whereas for the authorized migrants, percentages of settlement fluctuated between the years. By 2012, a greater percentage of the unauthorized agricultural migrants had settled in the U.S. in comparison to authorized migrants.

³ The NAWS began the collection of the nonsettler versus settler variable in 1991 and thus no information is available for 1989 and 1990.

Figure 1. Percentage of Unauthorized and Authorized Agricultural Migrants from Mexico Settling in U.S., 1991-2012.



Source: The National Agricultural Workers Survey. (2012). United States Department of Labor. www.doleta.gov/agworker/naws.cfm

4.0 Descriptive Statistics

Table 1 displays the frequencies for the dependent and independent variables for both authorized and unauthorized migrants. In 2005—2012, 85.4 percent of the authorized sample was settlers compared to a slightly lower 83.4 percent for unauthorized agricultural workers. As discussed in the previous section, the settlement of unauthorized migrants increased after 9/11 and further increased by 2008. It is postulated that the economic recession which began in 2008 made the cost of migrating to the U.S. much higher and cut off replenishment labor for agriculture. However, this recession should have caused some migrants to remain in the U.S. because of the increased costs associated with circular migration, while improved production methods in farming allowed production to occur year around and thus likely encouraged some would be migratory workers to settle permanently (Kandel, 2008).

In reference to destination regions within the U.S.⁴, California accounted for 50.9 percent of authorized agricultural migrants and 46.7 percent of unauthorized migrants. Given California’s preeminence in agriculture and that it is the most agricultural labor-intensive state (Kandel, 2008), these concentrations are not surprising. Even though California has adopted immigration enforcement, agricultural areas in California are largely exempt from this policy (Parrado, 2012). The Northwest comprised 17.0 and 16.0 percent of the authorized and unauthorized samples. The northwest region has had a longer history of migration of agricultural workers and a more benign climate for agriculture than other long time attractors of migrant workers such as the Midwest which comprised only 7.1 of the authorized and 7.7 percent of the unauthorized agricultural samples. Given the importance of the Midwest in agriculture, these results are somewhat surprising. This may be a result of the overreliance on machinery for field crops instead of human labor. Only

⁴ See Appendix B for U.S. States and their respective regions.

8.0 and 5.7 percent of authorized agricultural migrants worked in the Southeast and East, respectively, compared to 14.3 and 11.2 percent of unauthorized agricultural migrants. Both the Southeast and East are new regions of settlement for the Mexican population and it may be that unauthorized Mexicans have an easier time finding agricultural work in these regions than they would in California or the Southwest. Only 11.3 percent of the authorized migrants and 4.1 percent of unauthorized migrants were from the Southwest. It may be that the Southwest relies on a higher percentage of native-born agricultural workers of Mexican ancestry. It must also be noted that three of these states: Arizona, Oklahoma, and Texas have strict immigration enforcement policies and can be considered hostile to unauthorized migrants (Ellis, Wright, & Townley, 2016).

Table 1: *Characteristics of Authorized and Unauthorized Agricultural Workers, 2005-12*

	Authorized (N= 3,531)	Unauthorized (N= 6,575)
Settler	85.4	83.4
California	50.9	46.7
Southwest	11.3	4.1
Southeast	8.0	14.3
Midwest	7.1	7.7
East	5.7	11.2
Northwest	17.0	16.0
Traditional States	64.5	42.5
Nontraditional States	8.2	35.6
Border States	14.3	6.4
Female	18.4	17.7
Under 25	4.8	25.5
Over 45	54.4	12.2
Low Education (0-5)	38.4	26.9
High Education (12+)	11.3	10.4
Speak English	25.0	10.3
Married	80.7	60.1
Spouse in U.S. Household	71.5	40.5
Kids Under 15 in Mexico	5.9	20.1
Referred by Friend/Relative	61.0	76.0
Land in Mexico	15.3	15.3
Horticulture	15.9	18.5
Fruits and Nuts	41.1	41.7
Vegetables	23.7	25.7
Field Crops	19.3	14.1
Nonfarm Supplemental	8.9	10.1

Source: The National Agricultural Workers Survey. (2012). United States Department of Labor. www.doleta.gov/agworker/naws.cfm

The West-Central States of Mexico—the traditional source region⁵ of migrants from Mexico—comprised 64.5 percent of the authorized sample versus only 42.5 percent for the unauthorized sample. The percentage originating from the nontraditional states of the Southcentral and Southeast of Mexico was 8.2 versus 35.6 percent for authorized and unauthorized migrants, respectively. Given that the nontraditional states were much later in sending migrants for agricultural labor than the traditional states, it is not surprising that unauthorized migrants were more represented from these states. The predominance of authorized migrants from the traditional states indicates that employment in the U.S. agricultural sector is still an important generator of income for this region of Mexico. The border states of Mexico contributed only a small percentage of agricultural migrants to the U.S.: 14.3 and 6.4 percent for authorized and unauthorized migrants, respectively. While the border region is in close proximity to the U.S. it is not a major agricultural region, but has been the focus of industry for the past 50 years, and many Mexican migrants may find other employment opportunities in the U.S. outside of agriculture.

The percentage of females in the sample was 18.4 and 17.1 for authorized and unauthorized, respectively. The gender imbalance is likely a result of females joining their male counterparts after the male migrants became settled in the U.S. The age distribution between authorized and unauthorized migrants displays a great discrepancy. The proportion of authorized migrants under 25 was 4.8 percent and for those over 45 was 54.4 percent. Given the physical demands of migrant labor, the relatively high percentage of migrants over 45 is a surprising finding. It is likely that a percentage of those over 45 benefitted from the IRCA policies of the 1980s and may have never given up on agricultural work. It is also likely that those over 45 had more experience and connections with the destination which may help them during economic downturns. Furthermore, these individuals may have acquired farm positions that require higher skill levels or have been placed in supervisory roles. The very small percentage of authorized migrants under 25 is probably a result of more remunerative employment opportunities and educational opportunities that can be accessed for individuals who are legally able to work in the U.S. For unauthorized migrants, the under 25 category accounted for 25.5 percent of the sample while the over 45 category accounted for 12.2 percent. Not surprising, given the difference in the age structure of the migrants, only 60.1 percent of unauthorized migrants were married compared to 80.7 percent of authorized migrants⁶.

In terms of human capital, 25.5 and 10.3 percent of the authorized and unauthorized migrants respectively spoke some English⁷. Given the age distribution of the authorized population, it is likely that these individuals have had a longer time in which to learn English than their unauthorized counterparts. The percentage of the migrant population with low education—less than 6 years—was 38.4⁸ for authorized and 26.7 percent for unauthorized, while those with high education—at least 12 years—was 13.3 percent for authorized and 11.9 for unauthorized.

⁵ See appendix for Traditional, Nontraditional and Border States in Mexico.

⁷ The NAWS categorizes spoken language into four categories: no English, very little English, some English, and speaks English well. This category aggregates the some English and speaks English well categories.

⁸ The education variable measures number of years of schooling. The data are not disaggregated by whether that schooling occurred in Mexico or the U.S.

In reference to connections with the origin/destination: for authorized migrants, 71.5 percent had their spouses residing in the same household in the U.S. compared to only 40.5 percent for unauthorized migrants. Only 5.9 percent of authorized migrants had children under 15 still in Mexico while for the unauthorized migrants this figure was 20.1 percent. The wide discrepancy in these characteristics between authorized and unauthorized is likely a result of the differences in the age structure of the two groups as well as the legal processes that make it easier for authorized immigrants to sponsor relatives. A small percentage of migrants—15.3 for both authorized and unauthorized—reported owing land in Mexico. Relatives and community members in the U.S. were very important to the authorized and unauthorized in securing their present job—61.0 and 76.0 percent, respectively—, and demonstrates the reliance on social networks in the U.S.

In terms of type of agricultural job in the U.S., 80.7—authorized—and 85.9 percent—unauthorized—worked in fruits/vegetables/horticulture, while the remainder worked in field crops. This may be a result of the fact that field crops require less labor intensive work than the others and need relatively few workers to handle the machinery.

5.0 Logistic Regression Results

Model 1 answers a very simple question: Were agricultural migrants from Mexico more or less likely to settle in the U.S. during the years of the Great Recession (2008–2010) and the post-recession period (2011–2012) than they were in the pre-recession reference period (2005–2007)? Both authorized and unauthorized migrants were more likely to settle during the Great Recession than in the pre-recession period suggesting that the Great Recession had an impact on their settlement decisions. There was no significant difference in settlement for authorized migrants in the post-recession period versus the reference period—pre-recession. Unauthorized migrants were 2.9 and 8.5 times as likely to settle in the recession and post-recession periods than in the pre-recession period. The higher odds of settlement during the post-recession period were unexpected. However, if more jobs or/and additional hours on already obtained jobs were available, this may have enticed some unauthorized migrants to permanently settle.

Model 2 displays the results for destination regions of migrants in the U.S. with the reference state of California. In all cases, authorized migrants working in other regions in the U.S. were less likely to settle than their counterparts in California. The Northwest, Midwest, and East have climates that are not as conducive to year-around agriculture and this may explain the lower odds of settlement in these regions. Note that this difference was not significant for authorized migrants in the Southeast and Southwest with more benign climates. For unauthorized migrants, each region, except the Southwest attained significance. The Midwest and Northwest had odds ratios of settlement significantly higher—3.5 and 2.9 times, respectively—than those from California. Both the Northwest and the Midwest have had a long history of migrant labor. For the Midwest, the restructuring of the agricultural industry has supplied Mexican workers with employment in meat processing plants and dairy farming which may supplement agricultural workers incomes during most of the year. Unauthorized migrants were 1.4 times more likely to settle in the Southeast than their counterparts in California. The long season for agriculture, the availability of supplemental employment in industries such as meat processing, construction, and services may explain the higher odds of settlement than the reference state, California. Unauthorized migrants from the

East—0.8—had odds ratios of settlement lower than those of California, likely a result of the seasonality of migrant labor in the East. For the Southwest, patterns of settlement for both authorized and unauthorized are likely working at cross purposes and likely accounts for the insignificance of this variable. The long history of settlement of the Mexican ancestry/immigrant population in this region probably encourages settlement while the proximity to the border discourages settlement.

Model 3 shows the odds ratios for migrants from three major source regions in Mexico: the Traditional origin states of the West-Central part of Mexico, the newer source regions of South Central and Southeastern Mexico—nontraditional—, and the border states of Mexico. For the authorized migrants, there are no significant differences in the odds ratio for settlement for any of the regions in comparison to the reference region of Mexico—remaining states. If authorized immigrants have particular places in the U.S. where they reside—such as California—and social networks within the U.S., place of origin within Mexico may not affect the odds of settlement. For unauthorized migrants, the odds ratio of settlement was highly significant for the traditional and nontraditional, states—0.73 and 0.66, respectively. In essence, unauthorized migrants from these two regions of Mexico were much less likely to settle in the U.S. than their counterparts from the remainder of Mexico. These results are not surprising. Traditional states have a long history of circular migration to the U.S. that was established 100 years ago (Massey, 1986), while nontraditional states have yet to establish migrant communities and many individuals are probably new to migrant labor in the U.S. and are less likely to settle. There is no significant difference in settlement of unauthorized migrants from the border states of Mexico in comparison to the Mexican reference states category.

Model 4 adds demographic, human capital, origin/destination connections, and type of job in with the variables from Models 1, 2, and 3. As for demographic variables, authorized and unauthorized females had an odds ratio of 1.7 and 1.4, respectively, and were more likely to be settlers than their male counterparts. This is consistent with most other migrant studies which find females to be more sedentary than males (Masferrer & Roberts, 2012; Reyes, 2001). Both authorized and unauthorized migrants under Age 25 had an odds ratio of settlement of 0.4 in comparison to the reference group—Age 25-44—, and this lower odds of settlement may be a result of the amount of work experience that younger migrants have accrued. It is likely that the under 25 group did not have the connections, nor the equity, to survive the economic downturn. It must also be acknowledged that potential unauthorized newcomers, many under the age of 25, did not enter the U.S. during the Great Recession and thus did not have a chance to participate in the NAWS survey. They may also have been some of the first to be laid off. Authorized migrants over 45 were less likely to settle than their counterparts in the 25-44 age range. The lower odds ratio of settlement for those over 45 is not surprising given the physical demands of agriculture and the likelihood that many of the authorized were nearing retirement age. Unauthorized migrants over 45 were just as likely to settle in the U.S. as their counterparts in the reference group—age 25-44. (See Appendix A)

Married individuals were less likely to settle than their unmarried counterparts. For authorized migrants, the odds ratio was 0.13 while for unauthorized married migrants the odds ratio of settlement was 0.62. Recall the age structure of the authorized migrants with over fifty percent exceeding age 45. It is likely that these

migrants have continued a process of circular migration that began decades earlier and may have no intention of bringing their mates to the U.S. Given the much younger age structure of unauthorized migrants it may be that these migrants have not attained the financial wherewithal to move their mates to the U.S. A different picture emerges with an examination of the location of the spouse. Migrants with a resident spouse in the U.S. household were 13.1 times authorized and 6.8 times unauthorized as likely to settle as those without a resident spouse in the household. Migrants with children under 15 years of age in Mexico were only 0.5 authorized and 0.6 unauthorized as likely to settle as migrants with no children under 15 in Mexico. Obviously, the need to return to Mexico is less when family members are present in the U.S. Having attained the present agricultural job through a friend or relative had no significance for whether authorized migrants settled in the U.S. In contrast, unauthorized migrants who were referred to their last job through relatives or friends were less likely to settle—odds ratio of 0.75. It may be that referrals are more important in obtaining the first U.S. job. After that, migrants may be able to make connections within the U.S. and secure jobs on their own. Often, these better jobs are not in the agricultural sector. Although not significant, authorized migrants with land in Mexico were less likely to settle. These individuals may have planned retirement in Mexico where their earnings would go further than they would in the U.S. In contrast, unauthorized migrants owning land in Mexico had an odds ratio of 1.3 of settlement in comparison to those without land in Mexico. It may be that these migrants have greater financial capital to support them in the U.S. and may be saving for return migration to Mexico after retirement.

Human capital variables revealed that lesser educated migrants, regardless of whether authorized or unauthorized, were less likely to settle than migrants with medium education levels—6–11 years. For unauthorized migrants, higher educated individuals were 0.72 times as likely to be settlers as the reference group. Previous studies have noted that migrants are selected from the middle skill levels and that Mexicans with very little resources cannot make an investment in migration while those with higher skills have a greater payoff in Mexico than in the U.S. (Orrenius & Zavodny, 2005). Extending this to these results, it appears that those with a modest amount of education benefit the most from settling in the U.S. Lower educated migrants may be required for more seasonal less-skilled work while higher educated migrants may move into more skilled farm labor and return to Mexico with their skill investments. Not surprisingly, authorized 1.8 and unauthorized migrants 2.7 with better English skill were more likely to settle than those with less English proficiency.

In terms of jobs, authorized migrants working in horticulture or vegetables had no significant differences in settlement than their counterparts working in field crops. However, authorized migrants working in fruit were significantly more likely to settle than those working in field crops. For unauthorized migrants, the odds ratio of settlement was 1.4 times higher for those working in horticulture than the reference group field crops. It may be that it takes longer to secure a job in horticulture, which tends to be semi-skilled, versus the other categories. Field crops require the least amount of experience and are likely to be the first jobs undertaken by newly arrived migrants. Not surprisingly, migrants working in a nonfarm occupation for at least one week out of the year, were more likely to be settled than their counterparts who did not have a nonfarm job—odds of settlement for authorized was 1.6 and unauthorized, 2.6.

6.0 Conclusion

Both authorized and unauthorized migrants had increased odds of settlement during the Great Recession, suggesting that the economic decline had an impact on settlement decisions. It is likely that both authorized and unauthorized immigrants delayed departure in order to recoup money that was lost during the Great Recession. Unfortunately, there is no way to measure the effect of enhanced immigration restrictions on the settlement of unauthorized Mexican agricultural workers using the NAWS database. Massey et al. (2015) found that the return of unauthorized Mexicans—not disaggregated by occupation—declined substantially from the 1980s to the early 2006 and attributes this to immigration policies. This paper is an attempt to begin to explore the effect of the Great Recession on a very difficult to study population: unauthorized agricultural workers from Mexico. More studies on the effect of immigration restrictions, deportation, and the Great Recession need to be undertaken on unauthorized migrants in the future.

In reference to destination regions in the U.S., both authorized and unauthorized migrants were less likely to settle in the East than their counterparts in California. In the case of the East, agricultural labor is more likely to be seasonal than in other regions of the country. For the remaining regions, authorized migrants had greater odds of return than their California migrants while unauthorized migrants had lower odds of return than authorized migrants in California. California may be the first destination in the U.S. for many unauthorized migrants and these migrants may be in a process of adjustment and may be more likely to return than their counterparts in other regions of the U.S. States also vary greatly in their response to unauthorized immigration and this could alter the internal migration patterns of agricultural migrants within the U.S. Unfortunately, the NAWS data on state of interview is too aggregated to reveal this relationship—except for the reference state California. However, Ellis et al. (2016) provide some insight on the variability of immigration enforcement by state and how it effects internal migration of immigrants. They used a variable which categorized states into hostile and non-hostile to immigrants and found that both authorized and unauthorized Hispanic immigrants avoided those states during the Great Recession. It is likely that restrictive immigration policies and the Great Recession have also affected movement of migrants within the U.S. during the early 21st century.

Mexicans often become a scapegoat when the U.S. experiences economic downturns. Forced repatriation of unauthorized Mexican migrants has been attempted with each recession. These policies are usually relaxed once the economic situation improves for the U.S. Unlike during the early twentieth century when American-born agricultural workers from the Great Plains were exploited to harvest crops in the West, there is a very small percentage of native-born individuals who are willing to work in agriculture in the twenty-first century. Thus, unauthorized migrant labor in agriculture is likely to continue or agricultural products will need to be marketed at a higher price than currently to stimulate employment of native born workers. At the other end of the spectrum, Mexico's falling fertility rates and transition into the global economy is predicted to initiate a labor shortage in agriculture in Mexico which will drive up U.S. farm wages (Taylor, Charlton, & Yúnez-Naude, 2012). Thus, the recent recession may just be a harbinger of the decline in the influx of Mexican labor.

Increased immigration control appears to increase operating costs and to entice unauthorized immigrants already in the U.S. to settle permanently (Massey,

Durand, & Pren, 2014). When economic conditions improve, the U.S. labor force in general, not just agriculture, will need another low wage supply of labor. Efforts to increase border patrol and to emphasize deportation once immigrants are in the country seem to work at cross purposes. Looser borders should encourage more circular-return migration of migratory labor between Mexico and the U.S. as the cost of that movement will be reduced.

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	Authorized				Unauthorized			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Demographics								
Female				1.663**				1.409***
Under 25				0.363***				0.393***
Over 45				0.607***				1.022
Family/ Friend/Mexico Connections								
Married				0.131***				0.618***
Spouse in U.S. Household				13.124***				6.758***
Children in Mexico				0.487***				0.594***
Referred by Friend/Family to Current Job				1.056				0.751**
Owens Land in Mexico				0.776				1.334**
Human Capital								
High Education				1.040				0.721***
Low Education				0.863				0.830*
English				1.820***				2.713***
Type of Job								
Fruit/Nuts				0.594***				1.148
Horticulture				0.700				1.397**
Vegetables				0.824				1.196
Field Crops (Reference)								
Nonfarm Job				1.552**				2.622***
Constant	4.868***	8.524***		15.826***	1.563***	4.392***	2.447***	2.1114*

***p<0.001; **p<0.01, *p<0.05

Appendix B

U.S. States and their respective regions

Traditional States (West-Central)	Guanajuato, Jalisco, Michoacan, San Luis Potosi, Zacatecas
Nontraditional States (South-Central/Southeast)	Chiapas, Guerrero, Hidalgo, Morelos, Oaxaca, Puebla, Veracruz
Border States	Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora, Tamaulipas
California	California
Southeast	Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina
Southwest	Arizona, New Mexico, Oklahoma, Texas
Pacific	Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming
Midwest	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
East	Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Rhode Island
