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METHOD OF PAY, MIGRANT'S LEGAL STATUS, AND WAGE GAPS

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Abstract

Modern sensibilities demand equal pay for equal work. Indeed this is backed up almost universally by legislation. Yet we continue to observe almost everywhere wage gaps that simply should not exist. Using 1989-2006 National Agricultural Workers Survey (NAWS) data, we draw together complementary institutional elements—nativity, legal status of immigrants, and method of pay, to study why foreign-born workers are paid lower wages. A wage equation and a selection equation for the choice of compensation method are jointly estimated first. Results show that pay method is mostly not correlated with person characteristics. Rather, it is a function of the crops and tasks workers are engaged in. Workers paid by the hour earn less regardless of nativity and legal status. And, a number of worker, work, and employer characteristics are important wage determinants. Oaxaca decompositions show that differences in characteristics explain about 119% of the wage advantage of native-born workers against unauthorized workers (mostly due to education and experience) and 73% of the wage advantage of authorized against unauthorized workers (largely due to experience). Interestingly, if authorized workers have the education profile of the native born, their pay advantage will be enhanced. If authorized foreign-born workers move to hourly rate pay jobs, they will lose their pay advantage compared to the native-born; if unauthorized workers move to these jobs, they will be disadvantaged even more; and, the wage penalty to being in hourly pay schemes is larger for unauthorized foreign-born workers if they have the same wage factors as the other two groups.

1. Introduction

Recent data indicates that 15.5% of the US labor force in 2009 is foreign born (Congressional Budget Office, 2010). Among crop workers, survey data show that the share of the foreign born is much larger at 77% in 2006 and 54% of all US crop workers are unauthorized.[1] One non-official estimate claims that more than 90% of US crop workers are unauthorized (see The Economist, 2010). Although farming, fishing, and forestry occupations is less than half a percent of all US employment, the large concentration of unauthorized workers in crop production is viewed by many as a manifestation of a broken US immigration system.

Modern sensibilities demand equal pay for equal work. Indeed this is backed up almost universally by legislation. Yet we continue to observe almost everywhere wage gaps that simply should not exist. Why? In particular, despite these protections, why are foreign-born workers paid lower wages, on average? According to the Congressional Budget Office (2010), in 2009, native-born men with less than 9^{th} grade education earn $600 on average per week while foreign-born men with the same educational attainment earn $510 per week. Those with 9^{th} to 12^{th} grade education with no high school diploma earn $650 and $530 per week, respectively. On average, male native-born crop workers earn $9.72/hour in 2006 while male authorized and unauthorized foreign-born crop workers respectively earn $9.24/hour and $7.45/hour. These gaps in pay between native- and foreign-born workers have contributed to the belief that immigrants take jobs from the native born because of their willingness to work at lower pay.

This paper studies the gaps in pay among native- and foreign-born crop workers in the United States. Of particular interest is the role of compensation method. We ask whether and to what extent compensation method matters in workers' pay and gaps in pay between groups of workers. Incentive

[1] These shares are calculated from National Agricultural Workers Survey (NAWS) Public Access data from the Department of Labor. We use 2006 weights provided by NAWS. The use of foreign (especially Mexican) labor in US agriculture has a long history. Between 1917 and 1921 and again between 1942 and 1964, a guest worker program (Bracero program) in US agriculture was in effect. Both were established in the midst of labor shortages in agriculture during the World Wars, though both programs lasted longer than initially intended and kept agricultural wages low (see Martin and Midgley (2006) for details).

effects (e.g., work effort) vary across compensation methods and workers may react to these incentive effects differently. Thus, more productive workers may self-select into jobs that pay by piece. We account for this possible self-selection in our empirical estimations.

We use public access data from the National Agricultural Workers Survey (NAWS). The data has been collected as part of legislative mandate introduced by the Immigration Reform and Control Act of 1986 (IRCA), see Pena (2010) and Gang and Yun (2008). IRCA consisted of two programs. The first (general) program "applied broadly to any illegal immigrant who could document that he or she had continuously resided in the United States since the end of 1981" (Rivera-Batiz, 1999, pp. 93-94). According to Pena (2010), 1.8 million applications were received under this program. The second is the Seasonal Agricultural Worker (SAW) program which applied to illegal immigrants doing field work for at least 90 days during the year ending May 1, 1986. This program generated 1.3 million applications (Pena, 2010).[2] IRCA granted legal status to about 2.7 million undocumented immigrants (Pena, 2010), 1.6 million under the general program (Rivera-Batiz, 1999) and 1.1 million under the SAW program (Department of Labor, 2000).

The NAWS data has two important features not available in survey data such as Current Population Survey. First, foreign-born respondents' legal status at the time of interview is available.[3] Second, respondents are asked whether they receive hourly or piece rate pay. Availability of nativity and legal status allow us to study wage differentials among three groups: native born, authorized immigrants, and unauthorized immigrants. From Figure 1, we observe that participation by the native born in crop production has increased slowly since 1989—from a 12% share in 1989 to a 22% share in 2006.[4] The share of the foreign born authorized to work dropped from a high 74% share in 1989 (soon after IRCA) to

[2] Due to concerns that formerly undocumented farm workers would leave agriculture once they obtain legal status, the Replenishment Agricultural Worker (RAW) program was introduced as part of IRCA. If there is a shortage in agricultural workers, RAW provided authorization for the employment of foreign workers in agriculture. This program was never used (Emerson, 2007).

[3] Because legal status is not typically asked in official surveys, few studies are able to differentiate the US labor market experience of authorized and unauthorized immigrants (an important exception is Rivera-Batiz, 1999).

[4] Data in this section are based on trimming procedures we use to obtain our sample (detailed below) and also uses the weights provided in the NAWS data set.

as low as 30% in 1993. This share rebounded in subsequent years and has remained at around 30%. Starting from a low base (due to IRCA), the share of unauthorized workers has remained steady at around 50% since the late 1990s.

Figure 1 about here

(Weighted) Mean real wages for the three groups appear in Figure 2. With a few exceptions, the mean wages of the native born are higher compared to unauthorized workers. The differential ranges from 5% to 21%. After the mid-1990s, the mean wage of authorized workers has more or less been similar to the native born. Not surprisingly, immigrants with legal status earn higher than those not authorized to work; the gap ranges from 1% to 17%.

Figure 2 about here

Recent literature has provided strong evidence that piece rate pay is closely related to workers' productivity which, in turn, is related to workers' observed characteristics such as education and experience (see e.g., Lemieux et al., 2007). Figures 3a and 3b contain the mean pay of crop workers given their nativity, legal status, and compensation method. Those in piece rate pay receive higher pay; however, more productive workers may be self-selecting into jobs that pay by piece (see e.g., Lazear, 2000). We account for this possible self-selection in our wage regressions. Thus, we jointly estimate a probit selection model (equal to one when a worker is on hourly rate pay) and a wage equation for these three groups: native-born workers; authorized foreign-born workers; and, unauthorized foreign-born workers. Then to understand the wage gaps between two groups, we use Oaxaca decomposition methods to decompose the wage differentials into those due to differences in wage factors (characteristics effect) and those due to differences in the effect of the wage factors on pay (coefficients effect).

Figures 3a and 3b about here

The rest of the paper is organized as follows. In the next section, we provide a short review of the relevant US labor laws that apply to agricultural workers. We also review extant empirical literature on compensation methods. We discuss the data used and empirical methodology in detail in Section 3. Our empirical results are analyzed in Section 4 and concluding comments are provided in Section 5.

2. Literature Review

2a. Relevant US Labor Laws

Three laws are relevant for our purposes: Fair Labor Standards Act (FLSA) of 1938; Migrant and Seasonal Agricultural Worker Protection Act (MSPA) in 1983, as amended in 1986 and 1995; and, H-2A provisions of the Immigration and Nationality Act (INA) of 1952. FLSA essentially mandates that those in agricultural employment earn no less than the federal minimum wage; however, several exceptions are provided. For example, "any employer in agriculture who did not utilize more than 500 "man days" of agricultural labor in any calendar quarter of the preceding calendar year is exempt…" (Department of Labor, 2008a). Those in agricultural employment are exempt from the overtime pay provisions of the FLSA.

MSPA covers protections accorded to migrant and seasonal agricultural workers. The law requires that workers when hired or recruited be informed (in writing if requested) of "the work to be performed, wages to be paid, the period of employment, whether state workers' compensation or state unemployment insurance will be provided." (Department of Labor, 2008b). MSPA also lays out standards related to the housing and transport of agricultural migrant and seasonal workers (e.g., transport vehicles are properly insured) and registration requirements for farm labor contractors.

Section H-2A of INA authorizes the lawful entry of temporary, nonimmigrant workers into the United States to perform temporary or seasonal agricultural work. The law requires that any employer who applies for H-2A certification must first attempt to fill vacancies with US workers and during the first half of the certified contract period said employer must continually engage in recruitment and hiring of US workers. Employers must offer and pay all (US and foreign) workers a wage rate that is higher of either the *adverse effect wage rate* [5] (AEWR) or the prevailing wage for a given crop/area. These rates cannot be less than the federal or state minimum wage. The law also stipulates that every worker must be

[5] *Adverse effect wage rates* are determined annually by the US Department of Labor. These are the minimum wage rates paid by employers of temporary, non-immigrant foreign agricultural workers to all (US and foreign) their agricultural workers. AEWR are based on the (combined) hourly wages of field and livestock workers from surveys conducted by the Department of Agriculture.

provided a copy of the work contract or job clearance order which includes information such as contract length, hours per day, and days per week workers are expected to work; rate(s) of pay; etc. All workers are also guaranteed to work at least 75% of the hours stipulated in the contract or clearance order, see Department of Labor (2010).

Despite these protections, NAWS data indicate that US crop agriculture relies substantially on unauthorized foreign-born workers, participation by the native-born has remained low (albeit has increased slightly), and authorized foreign-born share has steadied at around 33% (since IRCA), see Figure 1. Since unauthorized workers are not covered by the above mentioned protections, it is not surprising that their pay is lower compared to the native-born and authorized foreign-born workers, see Figure 2.[6]

Before we turn to the empirics, we briefly review the literature on method of compensation. The specification of the probit (hourly rate vs. piece rate) model we estimate is based on our careful reading of this literature. We also provide a review of the limited literature dealing with wage gaps among US crop workers by legal status and pay method. To our knowledge, our paper is the first to study wage gaps accounting for farm workers' authorized status and possible self-selection into pay methods.

2b. Method of Pay Literature

The use of performance related compensation schemes has increased since the 1970s (Lemieux, MacLeod, and Parent, 2009). Piece rate is one type of performance related pay (others are bonuses and commissions). Under piece rate pay, compensation is directly related to worker output or productivity; thus, its use should increase worker effort or discourage shirking. But, its adoption is not costless. Monitoring worker output is not costless. Therefore, the use of piece rate pay over hourly rate pay balances potential gains (i.e., increased effort) and costs (i.e., output monitoring). Piece rate is more likely when output monitoring costs are low and when worker effort monitoring is high (see e.g., Lazear (1986)).

[6] We should note that NAWS does not cover crop workers authorized to work under the H-2A program.

Because of piece rate pay's direct connection to worker productivity, besides increasing worker effort, the use of piece rate pay may also increase the quality of workers a firm attracts (see e.g., Chen and Edin, 2002). That is, high ability workers may be attracted to firms that pay by piece while low ability workers may gravitate to firms that pay by the hour, all else equal. As will be shown below, our estimation method will take this self-sorting process into account.

Several studies highlight factors related to whether workers choose or are paid piece or hourly rates. For example, Geddes and Heywood (2003) find that women are more likely to be paid using piece rates. They attribute this finding to women's lower expected tenure and weaker attachment to the labor market. Women prefer piece rate pay because this reward system provides more immediate return to current productivity than hourly rate pay. For our purposes, their results imply that unauthorized workers are more likely to be in piece rate pay jobs because not only are their expected tenures shorter, their attachment to the US labor market is also tenuous (i.e., they may be caught and deported).

Rubin and Perloff (1993) find a U-shaped relationship between the probability of being in piece pay jobs and age with a minimum at 34 years of age. According to the authors, a possible explanation for this is that "very old and very young workers might prefer time-rate employment, in which earnings are not directly tied to productivity. On the other hand, time-rate employers fire relatively unproductive workers. Thus, the old and the young may be restricted to working in piece-rate where they are unlikely to be fired for working slowly." (p. 1037)

Using data from the British Household Panel Survey, Booth and Frank (1999) find no relationship between worker's education level and the likelihood of receiving performance-related pay (includes bonuses and profit-sharing). From this they conclude that performance-related pay schemes reward unobserved worker ability rather than observed worker ability (i.e., education).

There is clear evidence in the literature that workers in piece rate pay (includes commissions) earn higher wages and are more productive compared to those in hourly rate pay. For example, Parent (1999) uses the National Longitudinal Survey of Youth data for 1988-1990 and finds that workers in piece rate pay earn higher average wages than those on hourly rate pay or on salary, even after controlling

for unobserved worker heterogeneity. Because Parent's data is longitudinal, fixed effects regression is used to control for unobserved worker heterogeneity. This mitigates the selection problem that more able workers self-select into jobs with piece rate pay.

Using data from Safelite Glass Corporation, Lazear (2000) finds that average wage increased by about 10% and worker productivity (i.e., average number of auto glass units installed per worker per day) increased by 44% when the company switched to piece rate pay. Under the new compensation scheme, workers are paid an average of $20 per unit of glass installed. However, if a worker's weekly pay using piece rates is less than the guaranteed pay, the worker will receive the guaranteed rate of $11 per hour. Lazear finds that half of the increase in productivity is due to the incentive effect of piece rate pay schemes (i.e., increase worker effort) and the other half is due to more able workers sorting themselves into this compensation scheme.

Our paper is closest in spirit to Taylor (1992), Isé and Perloff (1995), Golan, Moretti, and Perloff (1999), and Rivera-Batiz (1999). Using survey data, Taylor (1992) finds that compared to unauthorized immigrants, authorized immigrants are more likely employed as machine operators, foremen, and supervisors (primary jobs) in California's agriculture sector. Additionally, unauthorized workers earn 29% less than authorized workers when employed in primary jobs while no differentials in earnings are observed between these two immigrant groups when employed in secondary jobs (e.g., manual planting or harvesting).

Isé and Perloff (1995) use 1989-1991 NAWS data to study the relationship between legal status, earnings, and hours worked. For the foreign-born, they estimate a multinomial logit model for workers' legal status (citizen, green card holder, granted amnesty, and unauthorized) and four earnings and hours worked equations (one for each authorized status type). They also estimate an additional earnings and hours worked equation for the US-born. This approach allows the authors to study how differences in characteristics, among native citizens for example, contribute to differences in earnings or hours worked. For example, they find an inverted-U relationship between log earnings and experience with a maximum at 27 (50) years old for green card holders (native citizens). Because our main concern is on the earnings

differentials between those in piece rate and hourly rate pay, unlike the authors, we take individuals' authorized status as exogenous when estimating the earnings equations.

Golan, Moretti, and Perloff (1999) study the relationship between earnings and workers' legal status (citizen, green card holder, granted amnesty, and unauthorized) by estimating two earnings equations (piece rate and hourly rate). They account for selection into either pay type using 1995 NAWS data. They estimate the model by worker's region of employment. For the Midwest region (the only region included in the paper), the piece (hourly) rate regression has 17 (89) observations. Because of the regional approach, their samples are small; thus, they use generalized maximum entropy (GME) estimation. GME had the lowest variance and mean square error compared to other procedures (e.g., Heckman's two-step). Their GME estimates show that among piece rate earners, citizens and those granted amnesty earn higher rates than unauthorized workers. And, among the hourly rate earners, green holders earn lower rates than unauthorized workers.

Rivera-Batiz (1999) studies the earning differentials between legal and illegal Mexican immigrants in the United States. He uses the Blinder-Oaxaca decomposition method and finds that 51% of the wage premium received by male legal Mexican immigrants in the United States cannot be explained by differences in measured characteristics such as education and work experience. Rivera-Batiz concludes that undocumented Mexican immigrants face systematic discrimination in the US labor market.[7]

Taylor (1992) cautions that when studying the relationship between legal status and earnings, it is important to recognize that legal status may be measured with error as authorized workers have no incentive to misreport their status while unauthorized workers have an incentive to report their status as authorized. Thus, the authorized subsample may actually include unauthorized workers. Empirically, this means that the two groups (legal and illegal) may appear to be more similar than they actually are. Unfortunately, there is no way around this possible misreporting by the respondents; however, for our

[7] According to the author, discrimination occurs when similarly productive workers are treated differently because of the demographic group they belong to.

purposes, interviews were conducted outside the place of work, this presumably would elicit more truthful responses especially with regard to one's authorized status.

3. Data and Empirical Methodology

3a. Data

We use NAWS Public Access Data from 1989 to 2006 from the Department of Labor.[8] The dataset includes data for 46,566 respondents. NAWS conducts face-to-face interviews on a random sample of 1,500-3,600 crop workers each year. To account for the seasonality of agricultural work, three interview cycles are done each year (October, February, and July). Survey questions include respondents' demographic characteristics such as age, educational attainment, and self-reported English-speaking ability. Questions also include respondents' (nominal) hourly earnings, method of pay[9], and crop-type worked (e.g., field crops); workplace characteristics such as whether current employer provides health insurance or monetary bonuses, and whether employer is a grower or a farm labor contractor (FLC). We use the consumer price index to obtain hourly pay in real terms (2000=100).

We use two pieces of information from NAWS to identify farm worker's nativity and authorized status: NAWS asks respondents to identify whether they were born in the US or in Puerto Rico or not. And, whether they are a citizen, green card holder, other work authorization, or unauthorized. We grouped foreign-born citizens, green card holders, and those with work authorizations to focus on nativity (native-born versus authorized and unauthorized foreign-born) and authorized status (e.g., authorized immigrants versus unauthorized immigrants). We only consider male crop workers in this study.

[8] Data are downloadable at http://www.doleta.gov/agworker/naws.cfm. The survey covers "nearly all farmworkers in crop agriculture, including field packers, and supervisors, and even those simultaneously holding nonfarm jobs. However, the sample excludes secretaries and mechanics, and H-2A temporary farmworkers. The NAWS does not sample unemployed agricultural workers." (Department of Labor, 2000, p. 1)

[9] To focus our analysis, we excluded male respondents receiving combination (hourly and piece rate) pay, n= 695 individuals, and salaried crop workers, n=1,059.

3b. Empirical Methodology

Our estimation model is the so-called treatment model. That is, we jointly estimate a wage equation and a selection equation for the choice of compensation method. The wage equation is specified as follows with pay method, *Hourly*, as one of the independent variables:

$$lnW = \beta_0 + \beta_1 Hourly + \beta_2 Educ + \beta_3 English + \beta_4 Age + \beta_5 Age^2 + \beta_6 Exper + \beta_7 Exper^2 + \beta_8 Curremp + \beta_9 Curremp^2 + \beta_{10} Married + \lambda' Ethnicity + \gamma' Crops + \mu' Tasks + \delta' Farm + \varphi' Region + \tau' Period + \varepsilon \quad (1)$$

where *lnW* is the natural log of real pay per hour received. Piece rate pay is converted into hourly rate by NAWS and this is available in the Public Access data file.[10] *Hourly* is a qualitative variable equal to one if the worker is paid on hourly rate and zero if the worker is on piece rate pay. *Educ* is highest education attainment ranging from 0 (no schooling) to 16 (4th year college). *English* is equal to one if respondent's self-reported speaking ability is somewhat or well, and zero if does not speak English or speaks the language a little. Age is the person's age at the time of interview. *Exper* is the number of years doing farm work in the United States. *Curremp* is the number of years with the current employer. *Married* is equal to one if married or living with someone and, zero if either single or divorced, separated or widowed. *Ethnicity* includes a set of qualitative indicators for respondent's ethnic background, we consider four classifications: Hispanic, non-Hispanic white, non-Hispanic black, and non-Hispanic other (base category).

A set of qualitative indicators for field crops (e.g., corn), fruits & nuts, horticulture, and vegetables is included in *Crops*. Miscellaneous or multiple crops is the omitted category. Likewise, a set of qualitative indicators for pre-harvest, harvest, post-harvest, semi-skilled is included in *Tasks*. The

[10] Piece rate pay is obtained from several survey questions. Respondents are asked: "Are you paid? 1) by the hour, 2) by the piece, 3) combination hourly-piece, 4) salary. If a respondent is paid by the piece, he is asked "Are you paid as an individual or by the crew?" Responses to these two questions are available in the NAWS Public Access data file. From our correspondence with the Department of Labor, piece rate pay is calculated as follows: [(piece rate x piece per day)/hours per day]/number in crew. These four variables are not available in the public access data file.

omitted task is other tasks.[11] According to NAWS, pre-harvest includes hoeing and transplanting; post-harvest includes field packing, sorting, or grading of produce; semi-skilled activities include pruning, irrigating, or operating machinery; other tasks mostly include work in greenhouses.

We also control for three employer characteristics. *Farm* includes three qualitative indicators: *Bonus* is equal to one if employer provides monetary bonus, zero otherwise; *Insure* is equal to one if employer provides health insurance or will pay care when respondent is injured at work or gets sick as a result of farm work; and *FLC* is equal to one if the farm worker is employed by a farm labor contractor, zero otherwise.

Finally, we include a set of region and period controls. NAWS data includes the following interview regions: East, Southeast, Midwest, Southwest, Northwest, and California (base region). Interviewers make worksite visits to explain the survey's purpose and ask a random sample of crop workers to participate. Workers are then interviewed in their homes or at another location of the farm worker's choice.[12] Since only workers currently engaged in farm work at the time of interview are included, the place of interview is the same as the worksite's location. We also introduce several year dummies with 1989 as base.

This specification follows from received literature. *Hourly* is expected to have a negative coefficient. Extant studies show that low ability workers gravitate to time rate pay (e.g., Chen and Edin, 20002). Since we account for self-selection or sorting into pay method, the coefficient estimate we obtain for *Hourly* reflects "pure" incentive effect of being in piece rate pay. Typically, more formal education leads to increases in pay; we ask if this applies to agricultural jobs as well (see e.g., Ise and Perloff, 1995). English-speaking ability may increase worker productivity; thus, we expect a positive coefficient. To account for the non-linear effects of age, overall US farm experience, and time with current employer, we introduce these variables and their corresponding square terms. US farm experience account for overall farm experience while time with current employer account for any farm-specific human capital. All these

[11] We excluded 80 supervisors from our sample as most of them are in hourly rate pay.
[12] Conducting interviews outside the place of work would tend to elicit more truthful responses especially with regard to one's authorized status.

are part of the observable components of worker's ability or productivity. We include two other demographic characteristics to capture marital status and ethnicity.

A series of qualitative indicators differentiate the types of crops farm workers are engaged in and the type of work they do. Field crops are highly mechanized while fruits & nuts and vegetables are the least mechanized. All else equal, farm workers in field crops are expected to earn the highest pay while those in fruits & nuts or vegetables production are expected to earn the least. Among the tasks involved, all else equal, we expect those in harvest work to earn the least as these jobs are the least mechanized and still mostly involve manual picking of produce (see e.g., Emerson, 2007).

Inclusion of monetary bonus and health insurance provision tests the notion that both supplement (rather than reduce) farm worker's regular income. The literature suggests that farm workers employed by contractors receive lower pay, all else equal. Finally, we also control for farm worker's region location to account for regional pay difference and a set of period controls to account for any pay differences over time.

The choice on payment method is assumed to be determined by the following latent variable:

$$Hourly^{*} = \alpha_0 + \alpha_1 Resid + \alpha_2 Resid^2 + \alpha_3 Educ + \alpha_4 Exper + \alpha_5 Kids + \alpha_6 House + \omega' Crops + \chi' Tasks + \upsilon' Region + \zeta' Period + \varepsilon \quad (2)$$

where *Hourly* is a qualitative variable equal to one if the worker is paid on an hourly basis (*Hourly** > 0), and zero if the worker is on piece rate pay (*Hourly** ≤ 0). We should note that the observed compensation method may be workers' and/or employers' selection. The crop worker may have some choice as to which job to take (given payment type) while employers set the compensation method. Therefore, the probit is in reduced form. We account for these two possibilities by including worker characteristics (e.g., time in the United States) and employer characteristics (e.g., crops) that may be correlated with the method of compensation.[13]

[13] Compensation method may matter in workers' pay and gaps in pay between groups of workers. Availability of alternative forms of compensation is crucial because if employers discriminate against one group and offer lower pay to this group, but two pay schemes are available (piece rate and hourly rate), the discriminated group may choose jobs that pay by piece rate. This is because they can work faster and harder, and boost their total pay.

Resid is the number of years residing in the United States. This is equal to the age of the respondent at the time of interview if native born; for the foreign born, this is the number of years from the year of first US entry to live or work to the time of the interview. *Kids* is the number of kids in the household; *House* is equal to one if the respondent owns or is planning to buy a house in the United States, zero otherwise.

Raw data suggests that those in piece rate pay receive higher wages, on average. This is because the use of piece rate pay increases worker effort (see e.g., Lazear, 2000). Thus, if available, we expect farm workers to prefer jobs with piece rate pay, all else the same. Since familiarity with agricultural job networks and choices increase with time in the United States, we expect the probability of choosing hourly pay jobs to decrease with US residency. However, beyond some point, as a person ages (corresponding to longer US residency), the probability of being in hourly pay may increase as older workers avoid the uncertainty in income inherent in piece rate pay. We account for differences in workers' skills using education and overall farm experience. We expect the probability of choosing piece rate pay method to increase with both education and experience since workers will more skills should expect to earn higher pay in piece rate pay. We include the number of children a farm worker has and whether the person owns or is planning to buy a home in the United States as proxies for an individual's willingness to take risks. As argued previously, all else equal, income is inherently less predictable under piece rate pay; thus, we expect a farm worker to be more willing to choose hourly rate pay, the more children the person has, and if the person owns or is planning to buy a home in the United States.

Pay method is also a function of the type of crop involved. We expect those in fruits & nuts and vegetables production to be more likely in piece rate pay than those in other crops. Previous literature (e.g., Chan and Edin, 2002) also show that choice of pay method depends on type of work. Building on this, we also expect those in harvest work (e.g., picking strawberries) are more likely in piece rate pay compared to those in pre-harvest work (e.g., clearing land for planting). These regional and period

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Working faster and harder will not boost one's pay if one is paid by the hour, and there is only so much working hours in a given day. Practically, even if there is no discrimination in the labor market, more productive workers may self-select into jobs that pay by piece.

qualitative indicators account for any region or time differences in the use of one pay method versus the other.

Table 1 contains the weighted mean and standard deviations by nativity and legal status for our sample. Pooling data for all years, the difference in the mean real wage of native-born and foreign-born workers is statistically significant at the 5% level. Interestingly, in our sample, the mean real wage of authorized foreign-born workers is higher compared to the native born. But, the native born on average earn higher than the unauthorized workers. About 95% of the native born are on hourly rate pay compared to only 77% of the foreign born. Following Geddes and Heywood's (2003) argument, this suggests that foreign-born workers have weaker attachment to the US labor market. Surprisingly, the proportion in hourly rate among the foreign born is the same regardless of legal status. One would expect a lower rate for unauthorized workers as they are more likely to prefer pay schemes with immediate return to current productivity (piece rate pay). This is because they may be caught and deported at any given time. Native-born crop workers are more educated. The age and experience profiles of the native born and authorized foreign-born are comparable, both groups are much older and have more experience compared to the unauthorized foreign-born crop workers. The foreign born are mostly of Hispanic origin.

Table 1 about here

A larger proportion of the native born work in field crops, while a large proportion of the foreign born work in vegetable crops. More than a third of foreign-born workers are in harvest work compared to 19% of native born workers. At least 69% of the workers have employer provided health insurance or their employers will cover medical expenses when they are injured or get sick due to farm work. Only 13% of the unauthorized workers received monetary bonus from their employers, compared to 28% of authorized workers and 41% of the native born. A larger proportion of the foreign-born workers are employed by farm labor contractors. Close to half of the native-born crop workers are in the east and

southeast regions of the United States, half of the authorized foreign-born workers are in California, and half of the unauthorized foreign-born workers are in California and the eastern region.[14]

4. Analysis of Results

Probit estimates for method of pay choice appear in Table 2. For the most part, compensation method is not correlated with person characteristics. Across all groups, compared to workers in miscellaneous or multiple crops, those in fruits & nuts are less likely to be in hourly rate pay, native-born workers are less likely to be in hourly pay if they are in vegetable crops, and foreign-born workers in field and horticultural crops are more likely to be paid by the hour. We did not report the region and period dummy estimates in Table 2 to save space, but they show that compared to the foreign born in California, the foreign born in other regions are less likely to be in hourly pay. There is no evidence of regional differences in pay method among the native born. And, most of the period dummies are statistically insignificant. Thus, over time, there is no evidence that crop workers are more or less likely paid using one compensation method. Therefore, method of pay is mostly a function of crops, tasks, and employer location.

Table 2 about here

Wage regression results appear in Table 3. We focus on variables that are statistically significant at either the 5% or 1% level. All else equal, those in hourly rate receive 20-27% less pay compared to those in piece rate pay.[15] Education contributes positively to earnings albeit a small contribution. Each additional year of education increases pay by only about 1% or less. English-speaking ability is statistically significant at the 1% level only in the authorized sample. It provides a wage premium of 5%. Overall US farm experience and length with current employment have non-linear (inverted-U) effects on

[14] The eastern region includes North Carolina, Virginia, Kentucky, Tennessee, West Virginia, Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont, Delaware, Maryland, New Jersey, and Pennsylvania.

[15] We use Kennedy's (1981) suggestion that when the independent variable is a qualitative variable, the percentage change in semi-log models be calculated as follows: $100*\{\exp[\beta-0.5V(\beta)]-1\}$, where β is the estimated coefficient and $V(\beta)$ is the variance of β.

wages. Among native-born workers, non-Hispanic blacks (whites) earn 10% less (9% more) than other non-Hispanics. Except among unauthorized crop workers, married workers earn more.

Table 3 about here

Among the three groups of workers, those that work in fruits & nuts consistently earn 3-7% less than those engaged in miscellaneous or multiple crops. Compared to those engaged in other tasks (mostly greenhouse work), workers doing pre-harvest work earn less. Native-born workers doing harvest and post-harvest tend to earn less than those in other tasks while foreign-born workers in semi-skilled tasks, such as pruning, irrigating, or operating machinery, earn less than those in other tasks.

Benefits like health insurance and monetary bonuses supplement wages. All else equal, workers at farms that provide monetary bonuses tend to earn 4-8% more while foreign-born workers at farms that provide health insurance tend to earn 3-4% more than those at farms where these benefits are not provided. Crop workers employed by farm labor contractors (versus those directly-hired by growers) tend to receive 3-6% less pay. To save space, we did not report the regional and period estimates in Table 3, but for the most part, workers in the southeast and southwest earn less than those in California regardless of nativity and legal status, and the period dummies suggest a decline in real wages among the foreign born compared to 1989 (base period).

Since the correlations between the residuals from the probit and wage equations are not significantly different from zero, there is no evidence that more productive workers self-select into jobs that pay by the piece. Therefore, the wage decompositions we present below are not based on the joint estimation of the probit and wage regressions.[16]

To understand wage gaps between two groups we employ Oaxaca-type decomposition methods.[17] Broadly, the Oaxaca decomposition equation can be written as:

$$\overline{Y}_A - \overline{Y}_B = (\overline{X}_A - \overline{X}_B)\beta_A + \overline{X}_B(\beta_A - \beta_B) + \overline{e}_A - \overline{e}_B, \qquad (3)$$

[16] We should note that the wage regression estimates for this is qualitatively similar to those in the joint probit-wage regressions. (We are still working on the joint decompositions of the probit and wage equations.)

[17] This was initially introduced to study racial or gender wage differentials using regression analysis. However, it can be used to study differences using any continuous variable pertaining to individuals, households, or firms.

where $\overline{Y}_j$ and $\overline{X}_j$ are average log real wage and a $1 \times K$ vector of average characteristics of group *j* (*A* and *B*), respectively, β_j is a $K \times 1$ vector of parameters, $\overline{e}_j$ is an average error term that is zero by construction. The first, second, and third components of the right-hand side of the equation are the characteristics, the coefficients, and the residuals effects, respectively. The residuals effect is zero from OLS. We discuss the exact specification of our wage equation in the next section and these wage factors are the same factors in matrix X in the Oaxaca decompositions. Since we compare three groups, we perform three sets of pairwise decompositions.

The results in Tables 4a-4c use Oaxaca's decomposition method whereby wage gaps between two groups are decomposed into the total characteristics effect and the total coefficients effect (first row).[18] The estimated effects provide the following counterfactuals: The characteristic effect provides the effect of differences in the wage factors across the two groups, if these groups have the same coefficient estimates (i.e., coefficient estimates in the wage regressions are the same). The coefficients effect, on the other hand, provides the effect of differences in the estimated coefficients in wage regressions across two groups, if the groups being compared have the same characteristics (i.e., all wage factors are exactly the same). However, we should note that the total coefficients effect includes the effect of the constant term. Thus, we also report the total coefficients effect excluding the constant (second row) and the coefficient effect of the constant term (third row) in all three tables. Recall from Table 1 that the mean real wage for native-born workers in our sample is $7.04/hour, and for the authorized and unauthorized foreign-born workers in our sample, the mean rates are $7.16/hour and $6.45/hour. Taking the natural of the mean rates, the wage difference between native-born and authorized foreign-born workers is -0.0127 log points and 0.0805 log points between native-born and unauthorized foreign-born workers. The difference in pay between foreign-born authorized and unauthorized workers is 0.0932 log points.

Tables 4a-4c about here

[18] We did not report the standard errors to save space but they are available from the authors upon request. Oaxaca refers to these as explained and unexplained components, respectively. We refer the reader to Yun (2008; 2007; 2005a; 2005b; 2004) for details on the decomposition method we employ in this paper.

Table 4a compares native-born workers to authorized foreign-born workers. Neither of the total characteristics nor the total coefficients effects (first row) is significantly different from zero. However, the total coefficients effect without the constant term (second row) and the coefficients effect of the constant term (third row) are both significantly different from zero at the 1% level. The positive coefficients effect when the constant term is excluded means that the effects of wage factors on native-born workers are higher, if the two groups have exactly the same wage factors (i.e., same individual characteristics, work in the same region, and so on). The coefficients effect of the constant term is negative which means that if both wage factors and returns on these factors are the same for both groups, the wage of authorized workers would be 0.2534 log points higher.

When comparing native-born workers to unauthorized workers (Table 4b), only the overall characteristics effect is significantly different from zero at the 1% level. It is positive which means that unauthorized workers would earn more if they have the same characteristics as the native born (under the condition that the effect of the wage factors on the earnings of both groups is the same). As in the comparison with authorized foreign-born workers, the total coefficients effect excluding the constant term is positive and the coefficients effect of the constant term is negative, both significantly different from zero. Thus, wage factors have larger effects on native-born crop workers; and, if both wage factors and returns on these factors are the same for the two groups, unauthorized workers would earn 0.1491 log points more.

Among foreign-born crop workers (Table 4c), both the overall characteristics and coefficients effect are significantly different from zero at the 1% level. The positive characteristics effect suggests that if the wage factors have the same effects on both groups, the (log) wage of the unauthorized workers would be higher if they have the same characteristics as authorized workers. The positive coefficients effect suggests that if the wage factors are exactly the same in the two groups, the wage gap is entirely due to the effect of wage factors on pay, and the wage of authorized workers would be 0.0248 log points higher.

Summarizing the total effects, differences in characteristics explain about 65% (73%) of the wage advantage of authorized foreign-born workers when compared to native-born (unauthorized foreign-born) workers, and a larger portion of the lower wage received by unauthorized foreign-born workers is due to the characteristics effect when compared to native-born workers. Also, the estimated coefficients effect of the constant terms (third row) suggest that native-born crop workers receive favorable treatment and may be viewed as the wage premium for being born in the United States, see Tables 4a and 4b. The same estimated coefficients effect in Table 4c is indicative of the wage premium to having legal status among the foreign born.

We also report the characteristics and coefficients effects of individual variables (e.g., English-speaking ability) or a group of variables (e.g., Exper includes US farm experience and its square term). The characteristics effect of education in Table 4a is positive. If authorized foreign-born workers were to have the education profile as the native born, they will earn more, and this will add 0.0490 log points to their pay. Recall that in our sample, the authorized workers has a higher mean wage rate than the native born, so the negative share in Table 4a means that if authorized workers have the education profile of the native born, their pay advantage will be enhanced. English-speaking ability has a larger effect on the wages of the native born as evidenced by the positive coefficients effect of the variable.

From Table 4b, education and experience explain a large portion of the wage differential between native-born and unauthorized foreign-born workers. The positive coefficients indicate that if unauthorized foreign-born crop workers have the education and experience profiles of the native born, they will earn more. The positive coefficients effect for education indicates that the returns to education are higher for the native born.

English-speaking ability explains less than 10% of the wage gap among the foreign born, see Table 4c. But, experience again explains a large amount of the wage gap. Specifically, more than half of the gap in (log) wage is explained by both overall US farm experience and length with current employer. That is, if unauthorized workers have the experience profile of authorized workers, the decompositions show they will earn more.

Finally, recall that the hourly variable has a negative coefficient estimate in the wage regressions and a larger proportion of native-born workers are in this pay scheme, followed by authorized foreign-born workers (see Table 1). These explain why the characteristics effects are negative in Tables 4a-4c. If authorized foreign-born workers move to hourly rate pay jobs, they will lose their pay advantage compared to the native-born (Table 4a); if unauthorized workers move to these jobs, they will be disadvantaged even more (Table 4b). Compensation method does not explain a large amount of wage gap among foreign-born workers as the hourly variable has a less than 5% share (Table 4c). There is no evidence of any compensation method differential impacts between native-born and authorized workers (Table 4a) as the coefficients effect for *Hourly* is significantly different from zero at the 1% level only in Tables 4b and 4c. Since *Hourly* has a negative coefficient in the wage regressions, the negative coefficients effect means that the wage penalty to being in hourly pay schemes is larger for the unauthorized foreign-born workers if they have the same wage factors as the other two groups.

5. Concluding Remarks and Implications for Immigration Policy

To summarize, we find that compensation method is mostly not correlated with person characteristics. Rather, it is a function of the crops and tasks workers are engaged in. We find no evidence that more productive workers self-select into jobs that pay by the piece. Workers paid by the hour earn less regardless of nativity and legal status. And, a number of worker (e.g., experience), work (e.g., task type), and employer (e.g., health insurance provision) characteristics are important wage determinants.

Oaxaca decompositions show that differences in characteristics explain about 119% of the wage advantage of native-born workers against unauthorized workers (mostly due to education and experience) and 73% of the wage advantage of authorized against unauthorized workers (largely due to experience). Interestingly, if authorized workers have the education profile of the native born, their pay advantage will be enhanced. If authorized foreign-born workers move to hourly rate pay jobs, they will lose their pay advantage compared to the native-born; if unauthorized workers move to these jobs, they will be disadvantaged even more; and, the wage penalty to being in hourly pay schemes is larger for unauthorized foreign-born workers if they have the same wage factors as the other two groups. Lastly, not surprisingly,

our results suggest that native-born workers receive favorable treatment and there is a wage premium to having legal status among the foreign born.

Although our paper focuses solely on agricultural workers, our findings are useful to understanding broad immigration issues. For example, a popular argument against immigration (in general) is that immigrants willingly accept lower wages and this depresses the wages of native-born workers. Our findings suggest that one reason why unauthorized workers are paid lower wages is because of their education and experience profiles. If productivity increases with education and experience, then one reason why unauthorized workers receive lower pay is because less are less productive than comparable native-born and authorized foreign-born workers.

Agricultural work is not easy. These are physically demanding jobs. Are undocumented immigrants stealing US agricultural jobs? In the summer of 2010, the United Farm Workers (UFW) launched a campaign ("Take Our Jobs") inviting Americans to apply for field jobs. According to The Economist (2010), in three months time 3 million people visited UFW's website but only 8,600 people were interested in working in the fields. And, by "late September only seven American applicants in the "Take Our Jobs" campaign were actually picking crops." (The Economist, 2010, p. 42)

In the survey data we use, about 48% of the native-born and 92% of the foreign-born men have less than 12 years of formal education. As of 2009, only 10% of the 25 years or older, native-born, men in the United States has less than 12 years of formal education. Given native-born men's education levels, it is unlikely that their participation in farm work will increase given current wages. The crucial question at hand is what wage level will encourage more participation by the native born? In 2008, the median weekly earnings of all male wage and salary workers is $798 while those in farm work is $384. Would doubling of farm wages increase native born participation? How would this affect US farms' profitability? Available data show that contract and hired labor is only 10% of farms' production

expenses in 2006.[19] However, compared to 1990-92, prices received by farmers increased by about 20% in 2006 while wages increased by about 71% in the same period.[20] Can US farmers afford to pay higher wages and remain competitive?

Current immigration rules provide for the lawful entry of temporary, nonimmigrant workers to perform temporary or seasonal agricultural work (section H-2A of INA). Are current rules insufficient in substance and deficient in execution that a large proportion of agricultural work is done by unauthorized workers? Or, employers prefer the easy route of ignoring work status vis-à-vis the grind of applying for H-2A certification for their needs. Clearly, these issues need to be addressed. For how can more than half of workers in US crop agriculture be not authorized to work to begin with?

[19] Contract and hired labor expenses are only about 8-11% of farms' production expenses since 1989 (see USDA, http://www.ers.usda.gov/Data/FarmIncome/FinfidmuXls.htm). Available data show that labor's share was largest in 1951 at 13%.

[20] There is variation in the changes in prices received by farmers across commodity groups. For example, food grains prices increased by 34% while those for fruits & nuts increased by 54% in the same period (see Source: http://www.census.gov/compendia/statab/cats/agriculture/farm_income_and_balance_sheet.html).

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Figure 1. Percentage share of US crop workers by nativity and authorized status, 1989-2006

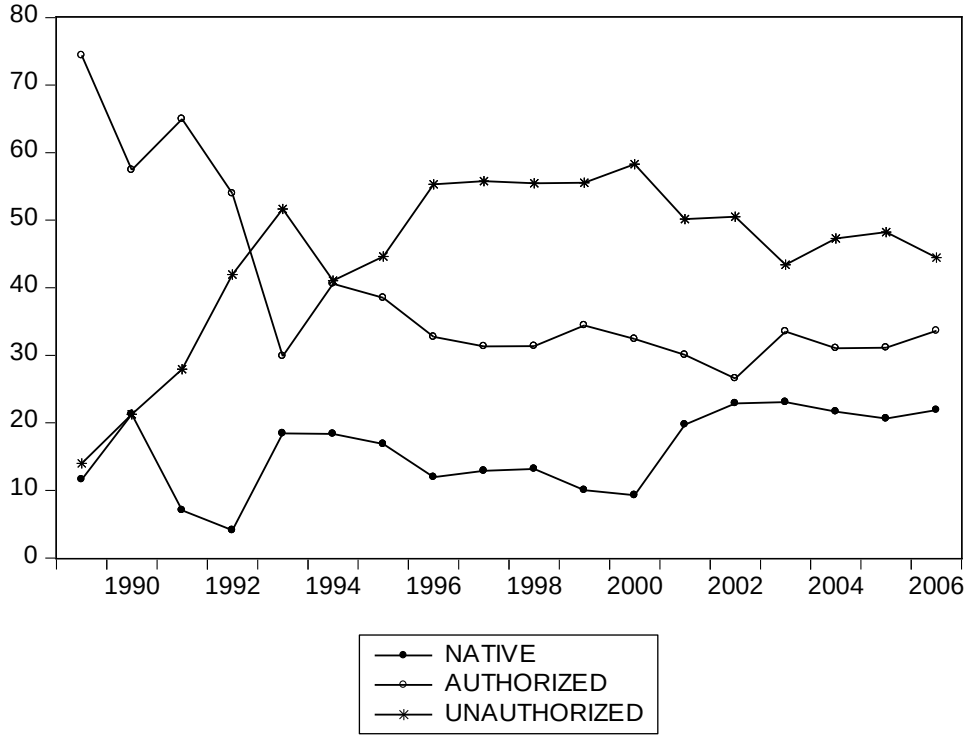


Figure 2. Mean real wage ($ per hour) by nativity and authorized status, 1989-2006

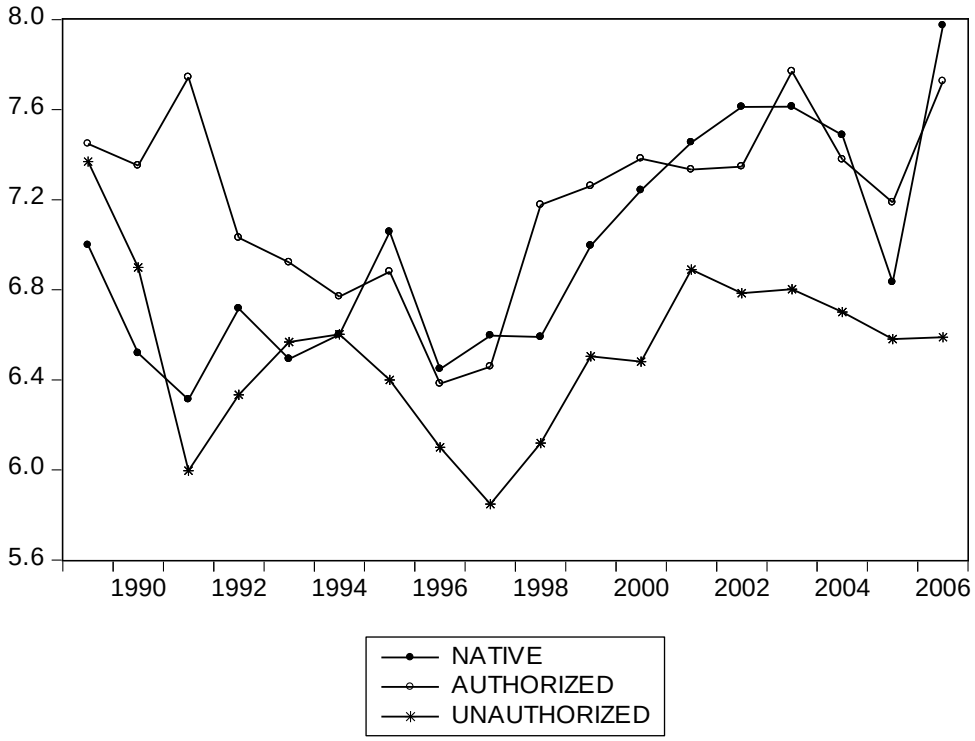
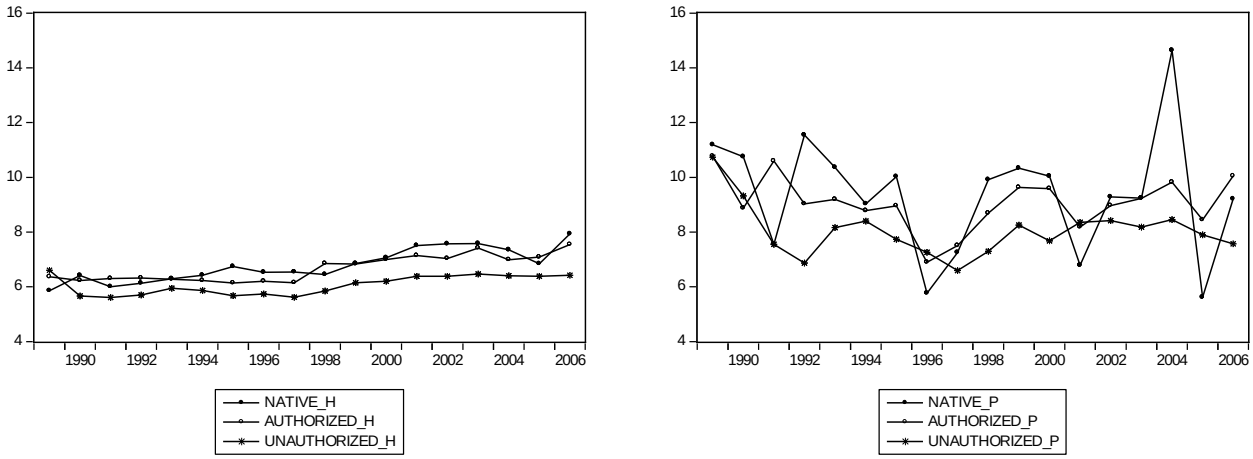


Figure 3a and 3b. Mean real wages by compensation method, nativity, and authorized status, 1989-2006



Note: Left (Fig. 3a): crop workers on hourly rate pay; right (Fig. 3b): crop workers on piece rate pay.

Table 1. Descriptive Statistics

	Native		Foreign-authorized		Foreign-Unauthorized	
Variables	Mean	S.D.	Mean	S.D.	Mean	S.D.
Real Wage	7.04	2.14	7.16 [2/]	2.27	6.45 [1/ a/]	1.80
Hourly=1	0.95	0.22	0.78 [1/]	0.37	0.77 [1/ b/]	0.40
Educ	10.50	2.99	5.69 [1/]	3.07	6.28 [1/ a/]	3.07
English=1	0.89	0.31	0.21 [1/]	0.37	0.07 [1/ a/]	0.25
Age	35.00	12.63	37.86 [1/]	9.87	28.34 [1/ a/]	8.92
Exper	14.62	11.92	15.09 [2/]	7.96	5.15 [1/ a/]	5.28
Curremp	6.41	6.99	5.70 [1/]	4.86	2.41 [1/ a/]	2.24
Hispanic	0.40	0.47	0.97 [1/]	0.14	0.99 [1/ a/]	0.10
Non-Hispanic, black	0.14	0.33	0.00 [1/]	0.05	0.00 [1/]	0.06
Non-Hispanic, white	0.45	0.48	0.00 [1/]	0.04	0.00 [1/]	0.05
Non-Hispanic, other	0.01	0.11	0.02 [2/]	0.12	0.01 [1/ a/]	0.07
Married=1	0.43	0.48	0.77 [1/]	0.38	0.51 [1/ a/]	0.48
Field	0.31	0.45	0.12 [1/]	0.29	0.17 [1/ a/]	0.36
Fruits & Nuts	0.12	0.32	0.44 [1/]	0.45	0.40 [1/ a/]	0.47
Horticultural	0.19	0.38	0.11 [1/]	0.28	0.12 [1/ b/]	0.31
Vegetables	0.27	0.43	0.27	0.40	0.26 [b/]	0.42
Other crops	0.11	0.30	0.05 [1/]	0.20	0.05 [1/]	0.22
Preharvest	0.18	0.37	0.15 [1/]	0.32	0.19 [a/]	0.38
Harvest	0.19	0.38	0.36 [1/]	0.43	0.40 [1/ a/]	0.47
Postharvest	0.15	0.35	0.07 [1/]	0.23	0.07 [1/ a/]	0.24
Semi-skilled	0.23	0.41	0.30 [1/]	0.41	0.21 [1/ a/]	0.39
Other tasks	0.24	0.42	0.12 [1/]	0.29	0.12 [1/]	0.32
Bonus=1	0.41	0.48	0.28 [1/]	0.40	0.13 [1/ a/]	0.32
Insure=1	0.85	0.35	0.80 [1/]	0.36	0.69 [1/ a/]	0.44
FLC=1	0.07	0.25	0.21 [1/]	0.37	0.28 [1/ a/]	0.43
East	0.25	0.42	0.08 [1/]	0.24	0.20 [1/ a/]	0.38
Southeast	0.20	0.38	0.08 [1/]	0.24	0.14 [1/ a/]	0.33
Midwest	0.29	0.44	0.13 [1/]	0.30	0.13 [1/]	0.32
Southwest	0.10	0.29	0.10	0.27	0.04 [1/ a/]	0.20
Northwest	0.09	0.27	0.13 [1/]	0.30	0.13 [1/]	0.32
California	0.08	0.26	0.49 [1/]	0.45	0.36 [1/ a/]	0.46
Resid	35.00	12.63	17.29 [1/]	8.20	5.87 [1/ a/]	6.34
Kids	0.62	1.09	1.18 [1/]	1.47	0.31 [1/ a/]	0.85
House	0.26	0.43	0.19 [1/]	0.35	0.02 [1/ a/]	0.14
Observations	3,520		9,294		10,670	

Notes: Weighted values. [1/ 2/ 3/] indicate that the difference between the native-born and foreign-born values is significantly different from zero at the 1%, 5%, and 10% level, respectively. [a/ b/ c/] indicate that the difference between the authorized and unauthorized foreign-born values is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Table 2. Probit Regressions

	Natives		Foreign-authorized		Foreign-unauthorized	
Variables	Est.	Std. Error	Est.	Std. Error	Est.	Std. Error
Constant	0.676	0.725	2.066 a/	0.227	1.968 a/	0.338
Resid	0.060 b/	0.025	0.014	0.011	-0.003	0.011
Resid sq./100	-0.054	0.033	-0.017	0.021	0.019	0.026
Exper	-0.012	0.009	-0.008	0.006	0.004	0.008
Educ	0.048 b/	0.020	0.016 b/	0.008	0.001	0.008
Kids	-0.052	0.059	-0.023	0.018	-0.020	0.025
House	-0.017	0.138	0.040	0.066	0.054	0.146
Field	0.045	0.291	0.692 a/	0.149	0.330 b/	0.130
Fruits & Nuts	-0.759 a/	0.271	-0.490 a/	0.112	-0.285 b/	0.112
Horticultural	-0.239	0.286	1.008 a/	0.226	1.479 a/	0.230
Vegetables	-0.508 c/	0.265	-0.090	0.117	0.112	0.114
Preharvest	-0.596 b/	0.256	-0.245	0.162	-0.294 b/	0.150
Harvest	-1.682 a/	0.236	-1.474 a/	0.147	-1.611 a/	0.133
Post-harvest	-0.407	0.285	-0.898 a/	0.173	-0.810 a/	0.160
Semiskilled	-0.665 a/	0.244	-0.568 a/	0.146	-1.003 a/	0.140
Region dummies	yes		yes		yes	
Period dummies	yes		yes		yes	
Correlation coeff. probit & regression error	-0.042	0.047	-0.003	0.023	-0.013	0.016
Log-likelihood	47.59		-2,378.93		-2,274.70	
Obs.	3,250		9,294		10,670	

Note: a/ b/ c/ indicate coefficient estimate is significantly different from zero at the 1%, 5%, and 10% level.

Table 3. Wage Regressions

	Natives		Foreign-authorized		Foreign-unauthorized	
	Est.	Std. Error	Est.	Std. Error	Est.	Std. Error
Constant	1.933 [a/]	0.111	2.103 [a/]	0.066	2.106 [a/]	0.060
Hourly	-0.315 [a/]	0.051	-0.293 [a/]	0.017	-0.228 [a/]	0.013
Educ	0.010 [a/]	0.003	0.006 [a/]	0.001	0.003 [a/]	0.001
English	0.001	0.020	0.046 [a/]	0.011	0.013	0.014
Age	0.011 [a/]	0.003	0.003	0.003	0.000	0.002
Age sq./100	-0.014 [a/]	0.004	-0.006 [b/]	0.003	-0.002	0.003
Exper	0.005 [a/]	0.002	0.005 [a/]	0.002	0.007 [a/]	0.002
Exper sq./100	-0.009 [b/]	0.004	-0.007 [b/]	0.003	-0.016 [a/]	0.004
Curremp	0.009 [a/]	0.002	0.012 [a/]	0.002	0.013 [a/]	0.003
Curremp sq./10	-0.002 [a/]	0.001	-0.003 [a/]	0.001	-0.003 [c/]	0.002
Hispanic	-0.018	0.028	0.019	0.024	0.000	0.027
Non-Hispanic, black	-0.104 [a/]	0.031	-0.002	0.045	-0.299 [a/]	0.053
Non-Hispanic, white	0.088 [a/]	0.028	0.111 [b/]	0.051	0.042	0.049
Married	0.048 [a/]	0.011	0.018 [b/]	0.009	0.011	0.008
Field	-0.016	0.020	-0.063 [a/]	0.016	0.000	0.017
Fruits & Nuts	-0.041 [c/]	0.023	-0.076 [a/]	0.016	-0.035 [b/]	0.016
Horticultural	0.032	0.021	0.000	0.018	0.021	0.015
Vegetables	-0.064 [a/]	0.019	-0.022	0.016	-0.021	0.016
Preharvest	-0.068 [a/]	0.016	-0.057 [a/]	0.012	-0.041 [a/]	0.010
Harvest	-0.072 [a/]	0.018	-0.019	0.014	-0.007	0.011
Post-harvest	-0.035 [c/]	0.018	-0.011	0.017	-0.018	0.013
Semiskilled	-0.006	0.015	-0.026 [b/]	0.012	-0.057 [a/]	0.010
Bonus	0.047 [a/]	0.011	0.077 [a/]	0.009	0.035 [a/]	0.010
Insure	0.020	0.014	0.027 [a/]	0.011	0.042 [a/]	0.009
FLC	-0.062 [a/]	0.024	-0.056 [a/]	0.009	-0.031 [a/]	0.007
Region dummies	yes		yes		yes	
Period dummies	yes		yes		yes	

Note: [a/ b/ c/] indicate coefficient estimate is significantly different from zero at the 1%, 5%, and 10% level.

Table 4a. Wage Decompositions, Native-born against Authorized Foreign-born
Log points difference: -0.0127

	Characteristics Effect		Coefficients Effect	
	Est.	Share (%)	Est.	Share (%)
Total	0.0083	-65.24	-0.0210	165.24
Total, excluding constant	0.0083	-65.24	0.2325 [a/]	-1831.49
Constant			-0.2534 [a/]	1996.73
Hourly	-0.0545 [a/]	429.19	-0.0101	79.29
Educ	0.0490 [a/]	-385.68	0.0247	-194.69
English	0.0004	-3.40	0.0131 [b/]	-103.24
Age [1/]	-0.0089 [a/]	69.92	0.1935 [b/]	-1524.36
Exper [1/]	-0.0076 [b/]	60.06	-0.0069	54.29
Curremp [1/]	0.0008	-6.09	-0.0104	82.09
Ethnicity [2/]	0.0359 [a/]	-283.00	0.0042	-33.29
Married	-0.0159 [a/]	125.11	0.0078 [b/]	-61.77
Crops [2/]	0.0131 [b/]	-103.04	-0.0014	11.00
Tasks [2/]	0.0084 [a/]	-66.15	-0.0033	25.80
Farm [3/]	0.0159 [a/]	-125.23	0.0061	-48.39
Region [2/]	-0.0405 [a/]	318.98	0.0162 [b/]	-127.70
Period [2/]	0.0122 [a/]	-95.90	-0.0012	9.47

Note: [a/ b/ c/] indicate coefficient estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively. [1/] Includes square term of the variable. [2/] Group variable, includes all qualitative indicators that belong to the group. [3/] Includes employer variables: Bonus, Insure, and FLC. Standard errors are available from the authors upon request.

Table 4b. Wage Decompositions, Native-born against Unauthorized Foreign-born
Log points difference: 0.0805

	Characteristics Effect		Coefficients Effect	
	Est.	Share (%)	Est.	Share (%)
Total	0.0961 [a/]	119.30	-0.0155	-19.30
Total, excluding constant	0.0961 [a/]	119.30	0.1336 [b/]	165.92
Constant			-0.1491 [b/]	-185.22
Hourly	-0.0585 [a/]	-72.67	-0.0262 [b/]	-32.58
Educ	0.0430 [a/]	53.41	0.0442 [a/]	54.96
English	0.0005	0.64	0.0053	6.55
Age [1/]	0.0006	0.77	0.1949 [a/]	242.06
Exper [1/]	0.0227 [a/]	28.15	-0.0033	-4.05
Curremp [1/]	0.0223 [a/]	27.74	-0.0076	-9.46
Ethnicity [2/]	0.0362 [a/]	44.93	-0.0731 [a/]	-90.85
Married	-0.0034 [a/]	-4.21	0.0002 [a/]	0.27
Crops [2/]	0.0108 [c/]	13.37	-0.0041	-5.09
Tasks [2/]	0.0136 [a/]	16.84	-0.0104 [a/]	-12.92
Farm [3/]	0.0297 [a/]	36.83	-0.0018	-2.20
Region [2/]	-0.0304 [a/]	-37.76	0.0112 [b/]	13.89
Period [2/]	0.0091 [a/]	11.28	0.0043	5.34

See notes in Table 4a.

Table 4c. Wage Decompositions, Authorized Foreign-born against Unauthorized Foreign-born
Log points difference: 0.0932

	Characteristics Effect		Coefficients Effect	
	Est.	Share (%)	Est.	Share (%)
Total	0.0684 [a/]	73.40	0.0248 [a/]	26.60
Total, excluding constant	0.0684 [a/]	73.40	-0.0795	-85.31
Constant			0.1043	111.91
Hourly	-0.0036 [a/]	-3.86	-0.0166 [a/]	-17.81
Educ	-0.0034 [a/]	-3.66	0.0170	18.24
English	0.0061 [a/]	6.55	-0.0138 [c/]	-14.86
Age [1/]	-0.0163 [b/]	-17.51	0.0272	29.20
Exper [1/]	0.0354 [a/]	37.97	-0.0015	-1.59
Curremp [1/]	0.0266 [a/]	28.50	-0.0022	-2.36
Ethnicity [2/]	-0.0003	-0.29	-0.0768 [a/]	-82.44
Married	0.0048 [b/]	5.17	0.0000	0.05
Crops [2/]	-0.0006	-0.69	-0.0044	-4.69
Tasks [2/]	0.0008	0.82	-0.0027	-2.93
Farm [3/]	0.0188 [a/]	20.18	-0.0130 [b/]	-13.91
Region [2/]	-0.0025	-2.72	0.0076 [b/]	8.15
Period [2/]	0.0027 [c/]	2.93	-0.0003	-0.34

See notes in Table 4a.