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IMMIGRATION REFORM AND FARM EMPLOYMENT DECISIONS

by

Philip L. Martin, J. Edward Taylor
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IMMIGRATION REFORM AND FARM EMPLOYMENT DECISIONS

ABSTRACT

This article presents a theoretical and empirical analysis of employer hiring decisions prior to the passage of the 1986 Immigration Reform and Control Act (IRCA). The findings suggest that employers had already adjusted the legal mix of their workforces to minimize losses associated with the possible removal of illegal-immigrant workers. Our findings also suggest that farm-labor contractors serve as "buffers" between farm operators and enforcement authorities, and that the adjustment costs associated with effective immigration law enforcement will be in commodities and tasks which are not perishable because they had not begun to adjust before IRCA was enacted.

Introduction

Immigrant workers have long been associated with labor-intensive western agriculture: Chinese immigrant workers during the 1880s were followed by Japanese, Filipino and Mexican immigrants during the 1920s and Mexican immigrants since World War II. The legal status of these immigrant workers has varied over the years, but since World War II most immigrant farmworkers have been contract workers (Braceros), permanent resident aliens or greencard holders, or illegal or undocumented workers.

During the 1970s and 1980s, western agriculture's dependence on illegal immigrant workers apparently increased. About 800,000 persons or unique Social Security Numbers were reported at least once to California unemployment insurance authorities in 1985 by crop employers and agricultural service firms who were defined by USDA to be engaged in Seasonal Agricultural Services (SAS), and almost 750,000 persons applied for legal status in California under the Special Agricultural Worker or SAW program (Martin, Taylor, and Hardiman, 1988). The Immigration Reform and Control Act (IRCA) of 1986 which established the SAW legalization program also made employers who knowingly hire illegal alien workers subject to fines or sanctions.

The purpose of this paper is to analyze the pre-IRCA employment patterns of illegal immigrants in order to predict the labor market adjustments expected to be wrought by IRCA. Before IRCA, the expected costs and risks associated with hiring illegal workers consisted primarily of lost productivity caused by Immigration and Naturalization Service (INS)

apprehensions of illegal workers. IRCA's employer sanctions are designed to dissuade employers from hiring illegal immigrants; these add a new element of direct cost and risk to the employers' hiring equation. Whether these employer sanctions deter the employment of illegal immigrants hinges on its enforcement, or more specifically, on employer perceptions of the degree to which employer sanctions are enforced. Cognizant of this, Congress increased funding for INS enforcement activities.

The impacts of employer sanctions and farmworker legalization on farm hiring practices will not be evident for some time. Employer sanctions became effective in perishable agriculture in December 1988. IRCA's agricultural provisions do not push farm labor markets in a consistent direction, and projections of their outcome are plagued by unknowns.[1] Until the impacts of IRCA are known, economic theory and farm employers' hiring decisions prior to the imposition of sanctions are the best guides to predicting the impact of IRCA on farm labor markets.

The objective of this article is to provide a theoretical and empirical starting point for such an analysis. The article proceeds as follows: Part I presents a theoretical model of employer hiring decisions given the uncertainty that characterizes reliance on an illegal-immigrant labor supply. Part II presents findings of an empirical analysis of farm hiring decisions using a multivariate probit analysis of data from a 1983 survey of the California farm workforce. The paper concludes by summarizing some of the implications of our findings for predicting the impacts of IRCA on farm hiring practices.

I

The impact of immigration-law enforcement on hiring decisions in the absence of direct employer sanctions operates primarily through the effect of this enforcement on the expected utility of farm profits. If farm employers are risk averse, this effect includes both expected-profit and risk considerations.

Consider an agricultural production technology described by the following production function:

$$q = F(L_0, L_1, K), \qquad F_i > 0, F_{ii} < 0 \text{ for } i = L_0, L_1, K$$

where q denotes output; L_0 and L_1 denote the quantities of legal and illegal labor inputs, respectively; K denotes capital; and F_i and F_{ii} are, respectively, the first and second partial derivatives of F with respect to factor i.

The costs of legal workers (w_0) and capital (r) are assumed to be known with certainty. However, we assume that the ex-post cost to employers of illegal labor is uncertain: if apprehensions of illegal workers occur, employers must incur an additional cost to recruit and hire replacement workers to take their place--or else risk production losses.[2] Thus, the cost to employers of hiring illegal workers is state-dependent, and hence random. It depends, among other things, on the perishability of crops and on the availability (cost) of replacements for workers who are apprehended. We denote this cost by $\omega_1 = w_1 + v(x)\varepsilon$, which consists of a deterministic wage component (w_1) and a stochastic component ($v(x)\varepsilon$); ε is assumed to be distributed with an expectation of zero and a variance of σ. The function $v=v(x)$ describes the influence of exogenous variables x (e.g., U.S. border-enforcement effort and

labor recruitment infrastructure) on the variability of the cost of illegal-labor inputs. This cost formulation results in stochastic net returns to illegal labor similar to the stochastic net returns to new technologies modeled by Just and Zilberman (1983).

For simplicity, and to focus attention on labor-hiring decisions, we make the additional assumption that capital inputs are fixed in the short run. Although there may be some important tradeoffs between labor and capital in the medium-to-long run, this assumption implies that there is a lag between employer desires to substitute capital for labor and the development of labor-saving capital (e.g., mechanical harvesters) in the short-run.

The producer is assumed to be risk-averse and an expected-utility-of-profits maximizer. Given our assumptions on the production function, profits are represented as:

$$\pi = pF(L_0, L_1, K) - w_0L_0 - (w_1 + v(x)\,e)\,L_1 - r\bar{K} \tag{1}$$

First-order conditions for maximizing expected utility of profits over legal and illegal labor inputs yield the following relationships:

$$EU(\pi)_0 = EU'(\pi)[pF_0 - w_0] = 0 \tag{2a}$$

$$EU(\pi)_1 = EU'(\pi)[pF_1 - (w_1 + v\varepsilon)] = 0 \tag{2b}$$

where $EU(\pi)_i$ is the first derivative of $EU(\pi)$ with respect to L_i, $i = 0, 1$.

Risk is explicitly modeled by approximating U′ by a Taylor-series expansion around expected profits (Just and Zilberman, 1983):

$$U'(\pi) \cong \bar{U}' + \bar{U}''(\pi - E(\pi)).$$

where $\bar{U}'$ and $\bar{U}''$ are, respectively, the first and second derivatives of utility evaluated at expected income. Substituting for U′ in (2a) and (2b), dividing through by $\bar{U}'$ and rearranging terms, we get:

(3a) $$pF_0 - w_0 = 0$$

(3b) $$pF_1 - w_1 - \bar{\phi}L_1 v^2\sigma = 0$$

where $\bar{\phi} = -\bar{U}''/\bar{U}'$ is the Arrow-Pratt index of absolute risk aversion, evaluated at expected profits.

Condition (3a) states that legal workers are hired up to the point where their expected marginal effect on net profits is zero; that is, where their marginal value product equals the market wage for legal workers.[3] Condition (3b) states that illegal immigrant workers are hired up to the point where their expected marginal profitability equals their marginal effect on the variability of profit, weighted by employers' aversion to risk. An increase in either the market wage or the risks ($v^2\sigma$) associated with hiring illegal-immigrant labor increases the shadow cost of illegal labor, while a decrease in farmers' risk aversion $\bar{\phi}$ reduces this shadow cost.

Optimal labor input demand functions, L_0^* and L_1^*, can be derived from (3a) and (3b) using the implicit function theorem; these are of the general form:

$$L_0^* = F_0 (w_0, w_1; v, \sigma, \bar{K}, \bar{\phi})$$

$$L_1^* = F_1 (w_0, w_1; v, \sigma, \bar{K}, \bar{\phi})$$

From these optimal demands for labor inputs we can formulate the optimal share of illegal labor in the total labor force demanded by the producer; for producer j this share is:

$$S^{j*} = L_1^{j*} / (L_0^{j*} + L_1^{j*}) \tag{4}$$

Equation (4) is the basis for the empirical analysis which follows.

II

Data on concentrations of illegal-immigrant workers by farm are not available. Instead, we use an indirect approach to estimate an econometric model of hiring corresponding to equation (4).

Consider an experiment in which a worker i is drawn at random from farm j, and the worker's legal status (LS_i) is recorded (1=illegal, 0=legal). The probability of finding an illegal immigrant on a given draw is equal to the share of illegal immigrants in the farm's work force:

$$P\,(LS_i^j = 1) \;=\; L_1^j \,/\, (L_0^j + L_1^j) \;=\; S^j$$

Assume that farmers act to maximize expected utility of profits; then $S^j = S^{j*}$. That is, the probability that the worker is illegal equals the optimal share of illegal immigrants in the farm's workforce. Through repeated draws it is possible to estimate concentrations of illegal-immigrant workers in the work force. If our model reasonably reflects employers' hiring decisions, the probability that a given worker is illegal is a function of the right-hand-side variables in (4), which represent the costs and risks associated with hiring legal and illegal-immigrant labor.

Let Z_i^j denote a (1 x K) vector of variables that "explain" legal-status hiring mixes on farms,[4] and let β represent a Kx1 parameter vector. Then, given micro-level data on the legal status of workers, the probability that a worker *i* drawn at random from farm *j* is an illegal immigrant can be estimated using a probit, in which this probability equals the share of illegal immigrants in the farm's work force:

$$P\,(LS_i^j = 1) = S_i^{j*} = F\,(Z_i^j \beta)$$

where S_i^{j*} is the share of illegal immigrants in the work force of the farm on which worker i is observed, $F(\cdot)$ denotes the normal distribution function, and ß represents the influence of variables Z_i^j on these illegal-immigrant shares.

Data

Our estimation of the hiring model utilizes a unique set of data on farm workers surveyed throughout California by the University of California (UC) and the California Employment Development Department (EDD) in August 1983. The survey covered 1,276 farm workers in 37 counties; workers in all major crops and production-related activities were interviewed in each survey area. In addition to information on current jobs, the UC-EDD survey gathered detailed socio-demographic data on all workers interviewed. The sample was designed to represent as closely as possible the statewide distribution of farm workers. Detailed descriptions of the data appear in Taylor and Espenshade (1987) and in Mines and Martin (1986).

The available data do not permit the estimation of a structural hiring model corresponding to equation (4). Instead, a reduced-form estimation approach is used, in which the effect of variables most likely to influence risk and expected returns to farmers' hiring decisions are explored. By sacrificing the ability to separate expected profit effects from risk effects explicitly, the reduced-form approach places a large burden on the interpretation of empirical results and, in this regard, on theory. An advantage of this approach is that it focuses attention on explanatory variables in the reduced-form equation that can be useful in tracking the impacts of employer sanctions in the future. These include characteristics of commodities and farms - including the labor markets in which farms are situated - that appear to be associated with differences in the costs and risks of legal versus illegal labor, and which thus are associated with past hiring patterns.

The costs and risks of illegal versus legal workers, in the most general sense, can be viewed as a function of three variables: commodity type, farm job, and labor market. Commodity type is closely related to the labor intensity of farm operations and also to perishability and marketing risk - factors frequently cited by farm interest groups seeking special protection under IRCA. Farms producing labor-intensive commodities, other things being equal, have an incentive to seek a plentiful and inexpensive supply of low-skill labor. Illegal immigrants are primary candidates for this role. The more perishable the commodity, however, the greater the risk of production losses if apprehensions of workers occur. Thus, producers of less-perishable labor-intensive commodities have a larger incentive to hire illegal workers than producers of more perishable commodities if there is a significant threat of immigration-law enforcement.

Similar considerations are likely to guide the hiring of legal and illegal-immigrant workers in different farm jobs. Other things being equal, labor-intensive farm jobs (e.g., tree pruning and thinning, harvesting) create an incentive for employers to hire inexpensive, low-skill workers who are likely to be illegal immigrants. Even if an illegal immigrant is just as productive as a legal worker in a relatively human capital-intensive, machine-operator or foreman job,[5] the risk of apprehension and ensuing productivity losses would make employers less likely to hire illegal workers for these jobs. Although employers generally have an incentive to hire illegal immigrants in labor-intensive harvesting jobs, this incentive is less in more perishable commodities and time-sensitive tasks.

In a given commodity and farm job, labor-market conditions can either enhance or diminish the costs and risks associated with hiring illegal-immigrant workers. Incomes and the availability of alternative nonagricultural employment for legal and illegal workers may influence the relative costs of these two factors and hence employers' incentives to hire them. Employers may find it more difficult to recruit illegal-immigrant workers in regions where living costs, particularly housing costs, are high.

Labor-recruitment infrastructure is likely to be one of the most important labor-market characteristics shaping risk. Even in relatively perishable commodities and in jobs where timing is critical, the risks associated with employing illegal workers can be reduced substantially if replacement workers can be recruited quickly and cheaply to replace apprehended workers. The farm-labor contractor (FLC) is the key actor in California farm labor markets with respect to recruiting workers for low-skill, labor-intensive jobs. All else being equal, we would expect the use of illegal immigrants to be greatest in labor markets where FLCs are most active.

Estimation and Findings

A multivariate probit was used to estimate illegal-immigrant shares on California farms using data from the 1983 UC-EDD farmworker survey. The results of three separate probit estimates are presented below. Each of these can be viewed as corresponding to a different statistical experiment. In the first experiment, we assume that workers are drawn at random from farms across the state, and we observe only the worker's legal status, commodity type, and the labor market (i.e., region) in which the farm is located. This

estimation enables us to test hypotheses regarding differences in illegal-immigrant labor use across commodities, jobs and labor markets. In the second experiment, we explore the ways in which specific characteristics of regional labor markets influence employers' hiring mixes, i.e., we explicitly test for the effect of farm-labor contractor activities, labor-market structure, income opportunities and housing costs on the utilization of illegal workers.

The third experiment considers a case in which worker characteristics influence the matching of workers with particular farm jobs, and we test for the effect of these characteristics on farm hiring mixes. This estimation corresponds to an experiment in which information on the commodity and labor market as well as on worker characteristics is used to predict worker legal status, and in which employers may be viewed as hiring "bundles" of worker characteristics. The variables appearing in the three probits are defined in Table 1.

Commodity, Farm Job, Labor Market and Hiring Mix

We begin by testing for differences in hiring mixes across commodities, jobs and labor markets. The results of this probit appear in Table 2.[6]

Most commodities included in our sample are produced with labor-intensive techniques; exceptions are tree nuts, some field vegetables (e.g., processing tomatos), and increasingly, wine grapes, about 40 percent of which are harvested mechanically in California. The findings in Table 2 indicate that, controlling for region and job type, the concentrations of illegal immigrants in nuts and vegetable crops are not significantly different from the default category (grapes). By contrast, citrus crops are associated with a

high concentration of illegal workers that is significant at the .01 level. Citrus crops are arguably the least perishable commodity covered by our data. Although it is difficult to categorize crops precisely in terms of their perishability, the extremes of the spectrum are relatively easy to identify. Delicate fruit crops like berries and peaches are more perishable, on average, than citrus, many varieties of which can be stored on the tree for several months in anticipation of improvements in market conditions.[7] Our findings show that field fruits have the lowest concentration of illegal immigrants of all the major crop categories we consider; this concentration is significantly less than the concentration in the default category at below the .05 significance level. The use of illegal immigrant workers in non-citrus tree fruits, while not significantly different from the default crop category, is significantly lower than in citrus crops.

Concentrations of illegal immigrants are lowest in the most capital and human capital-intensive farm jobs. The largest negative coefficients on task dummies are for machine operator and foreman positions, indicating that concentrations of illegals are lowest in these jobs because the sudden loss of workers in such jobs is likely to have the largest adverse effects on production--including the productivity of other (physical and human capital) factors (Taylor, 1989). The coefficients for crop sorting and tree pruning are also negative and significant, indicating that concentrations of illegal immigrants are lower in these than in the default (tree thinning) job category. A test for the differences between these coefficients and the coefficients on the machine operator and foreman dummies shows that the concentrations of illegal immigrants are significantly smaller in the latter.

Our default region is Inland Southern California, which includes the agriculturally significant Imperial Valley. This region has its trough farm labor employment in August. Interestingly, although this region borders on Mexico, the source of most illegal-immigrant labor in California, it did not have the highest concentration of illegal immigrants in its workforce at the time of this survey, probably because legal commuter workers who live in Mexico are readily available. The highest concentrations of illegal immigrants, controlling for crop and farm task, are in the San Joaquin Valley and the North Coast. The San Joaquin Valley accounts for about half of the agricultural employment in the state, and the peak agricultural activity in this region occurs during the summer months, when the UC-EDD farmworker survey was conducted. During winter months, the locus of farm employment shifts south, and there is evidence that the geographic distribution of the undocumented farm work force also shifts south (Espenshade and Taylor, 1988).

Farm-labor Contractors, Labor-market Characteristics and Illegal-labor Use

The findings presented in Table 2 highlight differences in illegal-immigrant labor use across commodities, farm jobs and regions. However, they do not make it possible to ascertain what characteristics of regional labor markets account for differences in illegal-immigrant labor concentrations. In our second set of estimates we explicitly introduce characteristics of regional labor markets into the analysis. The results of this estimation are presented in Table 3.

To explore the relationship between farm-labor contractor (FLC) activity and illegal-immigrant labor use, a FLC variable was constructed by assigning a "1" to workers hired through farm-labor contractors and a "0" to workers hired directly by farmers. The coefficient of this variable can be interpreted as representing the effect of FLCs on illegal-immigrant concentrations, controlling for crop, task, and other regional labor-market variables.

The estimated coefficient on the FLC variable highlights the key role played by FLCs in the hiring of illegal-immigrant labor in California agriculture: the coefficient is positive and significant at well below the .01 level. An analysis of elasticities at the means of the explanatory variables shows that recruitment through FLCs increases the probability that a worker is illegal by 12.2 percent, controlling for all other variables in the Table. This finding supports the hypothesis that FLCs, who have the capacity to supply large numbers of workers to farm employers on short notice, facilitate the use of illegal-immigrant labor by reducing employer risk of crop losses due to reliance on illegal-immigrant workers. It also indicates that FLCs are themselves major suppliers of illegal immigrant labor to California farms. FLCs may also be perceived by farm employers as representing a "buffer" between themselves and penalties for labor law violations.[8]

The coefficients on the other regional variables in Table 3 reflect the impact of specific characteristics of labor markets on farm hiring mixes. Use of illegal immigrants is lower in regions where overall unemployment rates are high. This finding is consistent with the hypothesis that the incentive to hire illegal immigrants is smaller in areas where labor is relatively abundant and where per-unit labor costs are likely to be relatively low. The coefficient

on average per-capita income is also consistent with this view: Where average per-capita income is high, the use of illegal labor is significantly greater than in low per-capita income regions, controlling for other variables in the Table. The significant negative coefficient on the housing cost variable (RENT) indicates that high regional housing costs discourage the use of illegal-immigrant labor. Illegal-immigrant labor use is significantly greater in predominantly agricultural labor markets than in labor markets where agriculture accounts for a smaller share of overall employment.

Inclusion of labor-market characteristics does not alter our key finding with respect to differences in illegal-immigrant labor use across commodities and farm jobs. Illegal immigrants are channeled into commodities and jobs where labor intensity is greatest and where the cost of apprehensions, in terms of productivity losses, is likely to be smallest.

Farmworker Characteristics and Legal Status

Human capital theory (Becker, Mincer, Chiswick) suggests that worker characteristics (age, education, experience) have important effects on earnings in U.S. labor markets. They are also likely to influence the assignment of workers to different farm jobs. A recent study found that education, work experience in the United States, and other worker characteristics were instrumental in explaining the allocation of workers to high-skill (machine-operator and foreman) versus low-skill, labor-intensive farm jobs, although the effects of these variables are closely tied to immigrants' legal status (Taylor, 1989).

In practice, employers do not draw from a homogeneous farm work force; they hire individuals who represent "bundles" of human-capital characteristics for different farm jobs. These worker characteristics are indicative of skills and potential productivity; they are also closely related to labor costs and are likely to be correlated with legal status. Employer demands for different skill mixes are likely to influence observed concentrations of legal versus illegal-immigrant labor across farms.

To explore the relationship between farmer demands for different worker skill mixes and illegal-immigrant labor use, we estimated a probit equation in which legal status was regressed on worker characteristics and on the commodity dummies and regional characteristics in Table 3. This probit corresponds to an experiment in which workers are drawn at random from fields, and their commodities, characteristics of the labor markets in which they are observed, and personal characteristics are recorded and used to estimate the probability that these workers are illegal immigrants.

The findings of this estimation appear in Table 4. Inclusion of individual worker characteristics in the probit does not alter our findings concerning commodities and FLC recruitment, indicating the robustness of our estimates with respect to these variables. However, it weakens the role of other labor market characteristics (unemployment, per-capita income and housing costs) in explaining hiring mixes.[9]

The individual characteristics themselves have a significant effect on the illegal-immigrant labor use variable. Age, education and U.S. work experience all are negatively related to the probability that workers are illegal immigrants. On the one hand, this finding reflects a negative association

between these variables and the legal status of individual workers. Alternatively, it can be interpreted as reflecting a negative relationship between employer demands for these worker characteristics and their hiring of illegal immigrant workers.

Past studies provide econometric evidence that migration networks, or home-town contacts in the United States, have a significant positive effect on illegal Mexico-to-U.S. migration (Taylor, 1987; Mines). The significant negative coefficient on our migration network variable indicates that, although home-town contacts in U.S. agriculture may facilitate illegal immigration, it does not follow that concentrations of illegal immigrants are highest where migration networks are strongest. Instead, illegal immigrants tend to have weaker home-town networks than legal workers in U.S. farm jobs.

III

CONCLUSIONS

Western agriculture became increasingly dependent on illegal immigrant labor in the 1970s and 1980s, a dependence that IRCA sought to break with employer sanctions. It is hard to predict the effects of IRCA on Western farm labor markets and Western agriculture, but analysis of pre-IRCA employment patterns indicates that IRCA's effects will not be uniform across agriculture.

This analysis indicates that even before IRCA, farm employers had adapted their employment practices to the legal status of their workers. Analysis of farmworker data indicates that illegal immigrant workers are

channeled into the lowest tiers of the farm labor market and into the least perishable commodities and tasks. This conclusion reflects rational employer behavior: given enforcement efforts and illegal worker availability, illegal-immigrant labor is employed disproportionately in the commodities and tasks that are associated with the smallest losses in the event work is disrupted by apprehensions of workers, so that, for example, proportionately more illegal workers are employed harvesting citrus than berries. Where costs of disruption are high, as in harvesting summer vegetables, there is much less reliance on illegal-immigrant labor. Our findings also suggest that farm-labor contractors facilitate the use of illegal-immigrant labor by reducing employers' risk of crop losses due to reliance on illegal-immigrant workers.

This analysis suggests that the greatest costs associated with effective enforcement of IRCA will be in commodities and tasks in which adjustments are not time-sensitive. This finding contradicts the popular image that the most perishable crops are most dependent on illegal immigrant workers: we find that rational employers faced with apprehension disruptions have already altered the legal status of their workforces to minimize such costs.

IRCA-related adjustments in commodities and tasks that depend on illegal-immigrant workers may not be as noticeable as expected if FLCs or other institutions emerge as "buffers" between farm operators and enforcement authorities. Just as "custom harvesters" emerged to prevent unions from organizing citrus operations under California's Agricultural Labor Relations Act (ALRA), so FLCs may be effective buffers for farm employers under IRCA (Martin, Vaupel, and Egan, 1988). If IRCA has effects similar to the ALRA, then FLC employment should expand rather than

contract as employers adjust to immigration reforms. The early evidence is that this FLC buffer is expanding: in Monterey county, for example, between 1986 and 1988, vegetable production rose, vegetable farms hired fewer workers directly, and FLC employment in this predominantly vegetable area increased almost 20 percent.

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FOOTNOTES

[1] The unknowns include, in addition to the degree to which employer sanctions are enforced, the number of farmworkers who will ultimately be legalized under the SAW program, the number of SAWs who exit agriculture and the number of replenishment agricultural workers (RAWs) authorized by Congress to enter the United States after fiscal year 1990 (for a discussion of implementation aspects of the SAW and RAW programs, see Martin and Taylor, 1989).

[2] Technically, the expected cost of illegal workers includes expected direct costs as well as expected productivity costs of apprehensions; for simplicity we represent these two distinct costs by their direct component. Expected productivity costs of apprehensions are considered elsewhere (Taylor, 1989).

[3] Even if all other worker characteristics are the same, the market wage for legal workers may diverge from that of illegal workers, reflecting the effect of immigration-law enforcement on expected labor costs; See Taylor (1989).

[4] As explained later, Z_i^j may also include characteristics of workers that lead these workers to join a given farm's workforce and/or that influence labor costs.

[5] The higher wages and status of such jobs may also increase the supply of domestic or legal workers available to fill them.

[6] The data used for the probit estimates that follow correspond to workers' current jobs, i.e., those in which they were observed at the time of the survey. The survey was conducted in August, at the peak of the farm labor season. Because of the seasonality of employment in California

agriculture (Martin and Taylor, 1988; Martin, 1988), our findings do not necessarily reflect conditions during other seasons. The changing seasonal composition of the California farm workforce is examined in Espenshade and Taylor (1988).

[7] Findings of a study of losses in quantity and quality of horticultural crops focusing on perishability using respiration rates of farm commodities (Kader) support this typology.

[8]Farm labor contractors have been prohibited since 1965 from knowingly hiring illegal aliens, and regulations governing FLC registration and record-keeping were tightened in the 1970s and 1980s. However, government inspections indicate that a majority of all FLC's violate labor laws, and farmers perceive labor contractors as intermediaries who can assert greater "control" over harvest workforces to minimize chances for union organizing or complaints about labor law violations (see Vaupel and Martin, 1986).

[9] A possible explanation for this finding is that worker characteristics influence workers' choices of labor markets in which to work. See Borjas (1984) and Taylor (1989).

REFERENCES

Becker, G. 1964. Human Capital. New York: Columbia University Press.

Borjas, G.J. 1984. "The Impact of Immigrants on the Earnings of the Native-Born." In V. Briggs, Jr. and M. Tienda (eds.), Immigration: Issues and Policies. Salt Lake City, UT: Olympus Publishing.

Chiswick, B.R. 1978. "The Effect of Americanization on the Earnings of Foreign-born Men." Journal of Political Economy 86(5):897-921.

Espenshade, T.J. and J.E. Taylor. 1988. "Undocumented and Seasonal Workers in the California Farm Work Force." Proceedings of the 40th Annual Meeting of the Industrial Relations Research Association (Spring, 1988), 182-191.

Just, R. and D. Zilberman. 1983. "Stochastic Structure, Farm Size, and Technology Adoption in Developing Agriculture." Oxford Economic Papers 35(2):307-328.

Kader, A.A. n.d. "Postharvest Biology and Technology: An Overview." In Postharvest Technology of Horticultural Crops. Cooperative Extension, University of California, Division of Agriculture & Natural Resources, Special Publication 3311, p. 3.

Martin, P.L. 1988. Harvest of Confusion: Migrant Workers in U.S. Agriculture. Boulder, Colorado: Westview Press, Inc.

Martin, P.L., S. Vaupel, and D. Egan. Unfulfilled Promise: Collective Bargaining in California Agriculture. Boulder, Colorado: Westview Press, 1988.

Martin, P.L. and J.E. Taylor. 1988. "IRCA and Farm Labor Data." Paper presented at the Joint Statistical Meetings, New Orleans, Louisiana, August 22-25.

Martin, P.L., J.E. Taylor and P. Hardiman. 1988. "California Farm Workers and the SAW Legalization Program." California Agriculture 42(6):4-6.

Mincer, J. 1974. Schooling, Experience and Earnings. New York: National Bureau of Economic Research.

Mines, R. and P.L. Martin. 1986. A Profile of California Farmworkers. Berkeley, CA: Giannini Foundation Information Series, 86-2, 1986.

Taylor, J.E. 1989. "U.S. Immigration Policy, Earnings and Mobility in the Farm Labor Market." University of California, Davis, Agricultural Economics Working Paper No. 88-12.

Taylor, J.E. 1987. "Undocumented Mexico-U.S. Migration and Returns to Households in Rural Mexico." American Journal of Agricultural Economics 69(3):626-638.

Vaupel, S. and P. L. Martin. Activity and Regulation of Farm Labor Contractors. Berkeley, CA: Giannini Foundation Information Series, 86-3, 1986.

TABLE 1

DEFINITIONS OF VARIABLES

Commodity Dummies (Default = "Grapes"):

CCITRUS	=	1 if citrus, 0 otherwise
COTRFRT	=	1 if non-citrus tree fruit, 0 otherwise
CNUTS	=	1 if nut crop, 0 otherwise
CFLDFRT	=	1 if field fruit, 0 otherwise
COTHER	=	1 if other crop, 0 otherwise

Farm Task Dummies (Default = "Tree Thinning"):

THARV	=	1 if harvest job, 0 otherwise
TIRRIG	=	1 if irrigation, 0 otherwise
TTRPRUN	=	1 if tree-pruning, 0 otherwise
TPLANT	=	1 if planting, 0 otherwise
THOE	=	1 if hoeing, 0 otherwise
TCRPSRT	=	1 if crop-sorting, 0 otherwise
TMACHOP	=	1 if machine-operation, 0 otherwise
TFORE	=	1 if foreman, 0 otherwise

Farm Region Dummies (Default = "Inland Southern California"):

LSSJV	=	1 if South San Joaquin Valley, 0 otherwise
LNSJV	=	1 if North San Joaquin Valley, 0 otherwise
LNCST	=	1 if North Coast, 0 otherwise
LSAC	=	1 if Sacramento Valley, 0 otherwise
LCCST	=	1 if Central Coast, 0 otherwise
LCSC	=	1 if South Coast, 0 otherwise

Labor-market Characteristics:

UNEM	=	Average regional unemployment rate, 1983
PCAPY	=	Average regional per-capita income, 1983
RENT	=	Median regional housing rent, 1983
SAG	=	Share of regional labor force in Agriculture, 1983
CONTRACT	=	1 if worker was hired through a farm labor contractor, 0 otherwise

Worker Characteristics:

AGE	=	Age
ED	=	Years of completed schooling
YSI	=	Years since first entry to the United States
HOMEAG	=	Number of home-town contacts in US farm jobs

TABLE 2

RESULTS OF PROBIT ON COMMODITIES, FARM TASKS AND REGIONS

Variable Name	Estimated Coefficient	T-Ratio
CCITRUS	0.5652	2.5589
COTRFRT	-0.0847	-0.5018
CNUTS	0.1579	0.6228
CFLDVEG	0.8321	1.5097
CFLDFRT	-0.3019	-2.2314
COTHER	-0.3631	-1.8297
THARV	-0.1737	-0.9526
TIRRIG	0.0357	0.1479
TTRPRUN	-0.5465	-2.2374
TPLANT	-0.6896	-1.8300
THOE	-0.3673	-1.2279
TCRPSRT	-0.6507	-2.6975
TMACHOP	-0.9927	-3.8528
TFORE	-1.1865	-2.2580
LSSJV	0.9744	4.6008
LNCST	0.9919	3.4610
LNSJV	0.8169	3.8859
LSAC	0.7087	2.8099
LCCST	0.7566	3.0677
LCSC	0.3272	1.2112
CONSTANT	-1.1148	-4.3357

TABLE 3

PROBIT WITH REGIONAL LABOR MARKET VARIABLES

Variable Name	Estimated Coefficient	T-Ratio
CCITRUS	0.4569	2.0780
COTRFRT	-0.0683	-0.4117
CNUTS	0.2077	0.8225
CFLDVEG	0.8071	1.4858
CFLDFRT	-0.3512	-2.5763
COTHER	-0.3880	-1.9898
THARV	-0.1628	-0.89781
TIRRIG	0.1735	0.70799
TTRPRUN	-0.5104	-2.0822
TPLANT	-0.6284	-1.6313
THOE	-0.2981	-1.0171
TCRPSRT	-0.5631	-2.3390
TMACHOP	-0.9244	-3.5352
TFORE	-1.1523	-2.2096
UNEM	-0.0926	-2.0284
PCAPY	0.0009	3.3874
RENT	-0.0165	-3.0009
SAG	6.3167	4.4282
CONTRACT	0.3064	2.8070
CONSTANT	-2.8321	-1.8008

TABLE 4

PROBIT WITH WORKER CHARACTERISTICS

Variable Name	Estimated Coefficient	T-Ratio
CCITRUS	0.7255	2.1808
COTRFRT	0.6241	2.4108
CNUTS	0.3352	0.7087
CFLDVEG	-3.5160	-0.0018
CFLDFRT	-0.1138	-0.5420
COTHER	0.0648	0.21661
AGE	-0.0226	-2.7198
ED	-0.0837	-2.8362
YSI	-0.0436	-3.6415
HOMEAG	-0.1850	-2.6696
UNEM	-0.0255	-0.32933
PCAPY	0.0005	1.3546
RENT	-0.0072	-0.83900
SAG	4.4759	1.9519
CONTRACT	0.3453	2.0289
CONSTANT	-1.1362	-0.4259