



Overview: Immigration, U.S. Agriculture, and Policy Reform

by Ximing Wu, Guest Editor

Immigration has increased significantly in the past two decades. In March 2005, there were 37 million foreign-born U.S. residents. Among them, 31% were naturalized citizens, 39% were legal immigrants and nonimmigrants, and the remaining 30% were unauthorized immigrants. It is believed that the actual number of unauthorized immigrants is even higher. Due to the rising number of unauthorized foreigners, there is an increasing pressure on immigration policy reform. In fact, one of the priorities of both the previous and current House and Senate is the reform of the current immigration policy.

The farm sector is one of the most important sectors that hires a large number of immigrants, especially low-skilled immigrants. Moreover, more than half of the immigrants working in the farm sector are unauthorized. Not surprisingly, the most significant recent immigration policy changes had its roots in agriculture. In 1986, under the Special Agricultural Worker legalization program of the Immigration Reform and Control Act (IRCA), more than 1.1 million Mexicans became legal immigrants.

Policy Reform

The influx of immigrants and the looming immigration reform obviously poses both an opportunity and a challenge to U.S. agriculture. Three options are discussed in current policy debates on immigration reform: (1) status quo, (2) enforcement of border security, and (3) enforcement, plus guest worker programs and legalization. The general consensus is that the status quo is not optimal. However, there is a heated debate between the enforcement-only approach and the comprehensive approach. The 2005-2006 House supported the enforcement approach while the Senate favored the comprehensive approach. The current Senate has again listed immigration

Articles in this Theme:

Overview: Immigration, U.S. Agriculture, and Policy Reform.....	35
Policy Shocks and the Supply of Mexican Labor to U.S. Farms.....	37
Immigration Reform, Agriculture, and Rural Communities.	43
The Impact of Immigration on American Workers and Businesses	49
Agricultural Labor Markets and Immigration	57

reform as one of its priorities and is now working on a new initiative concerning this issue.

In this special theme, we review the impact of immigration and the possible consequences of various policy reforms on U.S. agriculture, labor market, and rural communities.

Labor Market

One of the concerns of enhancing border security is its potentially negative impacts on the labor supply to the U.S. farm sector, which relies heavily on foreign workers. However, as suggested by Emerson, and Boucher and Taylor, the practical effectiveness of border security enhancement can be rather limited. On the one hand, foreigners determined to cross the border often eventually succeed, maybe after repeated trials. On the other hand, this enforcement will also deter unauthorized immigrants who want to cross the border from within the United States.

Regarding the legalization proposal, there is a concern that once given legal status, there will be an exodus of newly legalized foreign workers from the farm sector. However, Emerson argues that the available evidence does not support this claim. In terms of legalization's wage impact, Emerson suggests that the overall wage cost of

immigrants might be higher because of the elimination of wage penalty for unauthorized immigrants, but this will probably be compensated by the removal of potential risk associated with hiring unauthorized foreigners.

A popular perception of immigrants' impact on native Americans is that increasing immigration lowers the wages of native workers. Although there is limited evidence on the high-skilled segment of the labor market supporting this claim, it is generally not true for low skilled workers, including farm workers. One reason offered by Lewis is that native Americans and foreign workers tend to have different kinds of jobs, even when they are in the same sector or labor market segment.

Agricultural Production

Although their impacts on native Americans are small, immigrants are found to influence the U.S. agricultural production through various channels. Emerson and Lewis both suggest that farmers tend to adapt different production technologies

and crop mixes according to the relative supply of low-cost farm labors. Because of the adaptability of technology and crop mix, the long-run effect of policy reform is projected to be small.

Fiscal Impacts

Like native Americans, most immigrants pay taxes. At the same time, some of them are eligible for public services. Although there are some concerns on the fiscal burden imposed by immigrants on the public service system, existing evidence often suggests positive net fiscal impacts. Regarding unauthorized immigrants, Lewis reports that the percentage of this group taking advantage of public services is significantly smaller than that of other groups. On the other hand, most immigrant workers, regardless of their legal status, pay payroll taxes.

Trade

The relationship between trade and immigration goes in both directions. Boucher and Taylor report that the

North American Free Trade Agreement (NAFTA) increased the immigration from Mexico. On the other hand, Emerson indicates that reduction in foreign labor supply can prompt changes in trade, especially trade in labor-intensive agricultural products.

Rural Communities

Even in rural areas, the immigrant population differs from native residents in their social, economic, and cultural lives. Martin reviews various approaches and their consequences on how rural communities deal with the influx of immigrants. It is suggested that if private-public partnerships share the costs of integrating migrant workers, their families will turn an increasing immigrant workforce into a "positive externality" that benefits both local agriculture and community development.

Ximing Wu (xwu@ag.tamu.edu) is Assistant Professor, Department of Agricultural Economics, Texas A&M University, College Station, Texas.



Policy Shocks and the Supply of Mexican Labor to U.S. Farms

By Stephen R. Boucher and J. Edward Taylor

JEL Classifications: F16, F22, J43, J61

Immigrant farm workers from Mexico are unquestionably one of the most critical inputs to U.S. agriculture. They have facilitated the expansion of fruit, vegetable, and horticultural production, particularly in the Southwest. Their availability affects production technologies and enhances the ability of U.S. producers to compete with low-cost producers abroad.

A study of the supply of labor to U.S. farms immediately takes one to villages in rural Mexico where farm labor migration originates. According to the National Agricultural Worker Survey (NAWS), 78% of the U.S. farm workforce in 2001-02 was foreign-born and 75% was from Mexico. Just over half of all farm workers were unauthorized immigrants (U.S. Department of Labor, 2005). The actual share of unauthorized workers in the farm workforce is likely higher than this, because some do not reveal their true legal status.

In 2003, with support from a USDA NRI grant, we launched what to our knowledge was the first study of U.S. agricultural input supply ever conducted outside the U.S. borders. The Mexico National Rural Household Survey (ENHRUM), carried out jointly by UC Davis and El Colegio de Mexico in Mexico City, canvassed a nationally and regionally representative sample of households in rural Mexico in an effort to ascertain what drives the supply of labor to U.S. farms and the effects of U.S. immigration and trade policies on farm labor migration.¹ This paper summarizes our key findings.²

1. ENHRUM is the Spanish acronym for *Encuesta Nacional a Hogares Rurales de México*.

2. Boucher, et al. (2007) provide a more detailed discussion of this research.

The Importance of Mexican Migrant Labor

Nowhere are the U.S. and Mexican economies and societies more closely interwoven than through migration. The 2000 U.S. Census found that 9.2 million, or 1 out of every 12, Mexican-born persons were living in the United States.³ Analysis of the March 2005 Current Population Survey found that 30% of the foreign-born population was unauthorized, and 56% of the unauthorized migrant population, or 6.2 million, were from Mexico (Passel, 2006). These migrants are employed primarily in agricultural and low-skilled manufacturing and service jobs. While migration draws human resources out of households and communities throughout Mexico, it also generates a major source of income for the Mexican economy. The Banco de Mexico (2006) estimates that Mexican migrants sent home, or remitted, \$20 billion in 2005. Migrants, the “people export,” thus generated four times more revenue for the Mexican economy than agricultural exports and only slightly less than oil exports. Migrants to U.S. farms come overwhelmingly from rural areas, where poverty is concentrated in Mexico. Remittances from farm workers represent a *de facto* poverty alleviation policy, providing injections of capital into areas cut off from credit markets and that have been more spectators than participants in Mexico’s recent growth. Understanding the dynamics of U.S. agricultural labor migration and the potential impacts of policies on these dynamics, thus, is a research priority from the viewpoint of policymakers and farmers in Mexico.

3. Census data on the foreign-born are available online at <http://census.gov/prod/2003pubs/c2kbr-24.pdf#search=%22mexico%20foreign%20born%202000%20census%22>.

This is also a priority for policy makers and farmers in the United States. Labor constitutes approximately one-third of total costs of fruit, vegetable, and horticultural production in the United States. Most new entrants into the farm workforce are unauthorized immigrants from rural Mexico. California highlights the importance of Mexican migration in U.S. agriculture. It is the largest agricultural producer in the United States. Nearly all its seasonal agricultural workforce comes from households in rural Mexico. NAWS data reveal that more than 90% of California's 1996 seasonal workforce was foreign-born, and 90% of these foreign-born workers were from Mexico (Mines, Gabbard, & Steirman, 1997).

Immigration and Trade Policies

How have immigration and trade policies affected the supply of Mexican labor to U.S. farms? We examined the effects of the three key immigration and trade policy changes of the last twenty years: 1) Increased border enforcement expenditures; 2) The 1986 Immigration Control and Reform Act (IRCA); and 3) The North American Free Trade Agreement (NAFTA). These are the major policy shocks that may have affected the supply of rural Mexican labor to U.S. farms.

Increased enforcement along the U.S.-Mexico border, through such operations as Gatekeeper and Hold-the-Line, was aimed at directly deterring unauthorized immigration from Mexico by making illegal border entry more costly. While this may make villagers think twice about attempting to migrate, past research suggests that the majority of those who attempt an illegal border crossing eventually succeed. Because

increased border enforcement also potentially has the unintended effect of deterring return migration from the United States back to Mexico, the net effect is ambiguous (Public Policy Institute of California, 2002; Singer and Massey, 1998).

IRCA represented a unilateral policy effort by the United States to control migration via sanctions against employers who knowingly hire unauthorized immigrants. However, it also included a one-time general amnesty program and two special concessions to U.S. farmers. The Special Agricultural Worker (SAW) Program legalized an additional 1.2 million immigrants, the majority from Mexico. The Replenishment Agricultural Worker (RAW) program allowed for new immigration to alleviate farm labor shortages caused by SAWs leaving agriculture. However, the RAW was never used, because the Department of Labor determined that there were no farm labor shortages in the early 1990s, despite employer sanctions.⁴ Indeed, the U.S. Commission on Agricultural Workers (1992, p. xix-xx) concluded that there was "a general oversupply of farm labor nationwide" and, "with fraudulent documents easily available," employer sanctions were not deterring the entry of unauthorized workers.

NAFTA opened borders for trade and investment between Mexico and the United States and reinforced an on-going process of agricultural liberalization in Mexico. NAFTA and the concurrent domestic reforms in Mexico were only partially motivated by migration concerns; nevertheless, they were expected to have far-reach-

ing impacts on migration flows. President Salinas argued that opening up markets would help Mexico export more goods and fewer people, thereby reducing migration pressures. In theory, however, the effects of NAFTA on migration from rural Mexico are ambiguous. On one hand, one would expect economic liberalization to decrease production of maize and other goods that could be imported more cheaply from the United States, increasing emigration pressures. On the other hand, it could stimulate agricultural exports, as well as nonagricultural production in Mexico that may absorb displaced rural workers. Thus, just like border enforcement and IRCA, NAFTA's effects on migration from rural Mexico to the United States are ambiguous.

Data Challenges

Analyzing how a specific policy impacts migration dynamics is no easy task. In order to see whether or not and how migration patterns change in response to a policy, data on the number of migrants and where they work are needed for a sufficiently long period both before and after the policy is implemented. Until very recently, this type of data has not been available. The United States and Mexican Census of Agriculture and Population are too infrequent and do not collect the necessary information on immigration and sector of employment. Data are available on the number of apprehensions at the border; however, these data do not indicate where successful migrants work. Finally, scattered village surveys in Mexico provide some detailed migration information. However, the samples are small, not nationally representative and, in most cases, do not cover sufficiently long time periods

4. *An excellent discussion of IRCA and U.S. agriculture appears in Martin (1994).*

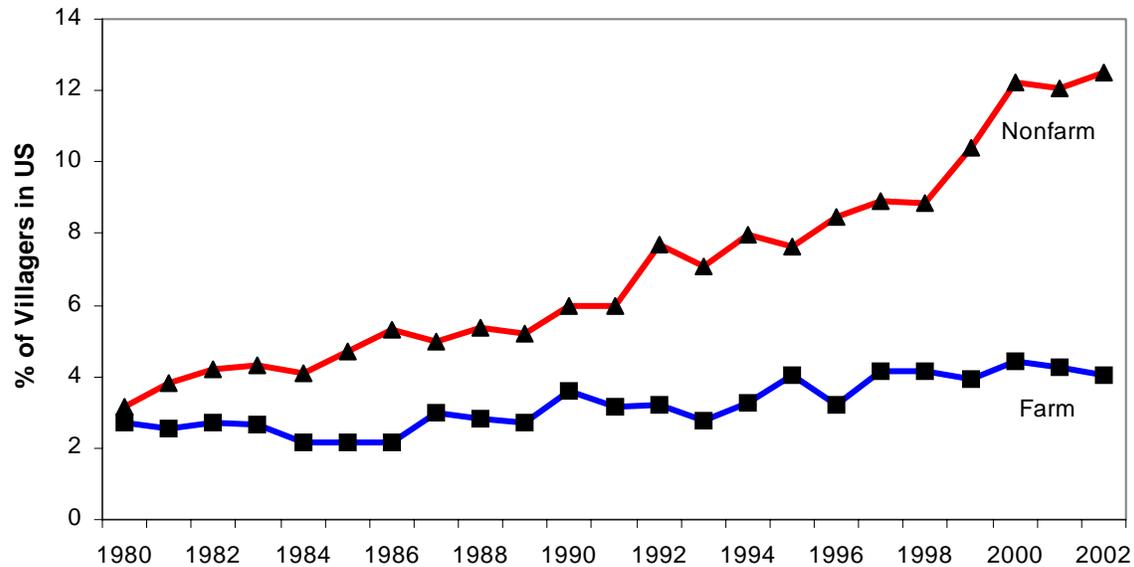


Figure 1. Percentage of Mexican villagers in U.S. farm and non-farm jobs.

to examine the impacts of new policies.⁵

The ENHRUM overcomes these problems. This survey was administered to 1,600 Mexican households in 2002 and is representative of rural Mexico at both the national and regional levels. The survey is unique in that it makes it possible to explore the dynamics of U.S. agricultural labor supply from Mexico and how they may have changed over time. It does so by reconstructing individuals' migration and work histories, including immigrants' sector of employment in the United States each year between 1980 and 2002. This time period is sufficiently long to permit us to examine both IRCA's and NAFTA's impacts on migration patterns. In what follows, we will focus on the West-Central region of Mex-

ico, including the states of Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, San Luis Potosí, and Zacatecas, because it has the longest history of sending migrants to the United States. According to the NAWS, in 2001-02 the largest share of Mexican-born farm workers (46%) was from just three West-Central Mexican states: Guanajuato, Jalisco, and Michoacán. From 2001 to 2004, 51.6% of the U.S. agricultural work force and 65.2% of California farm workers were from this region.

Migration Trends

How have overall patterns of migration to the United States from this region evolved over the past two decades? Figure 1 shows the fraction of adults from the villages that migrated to the United States to work in farm and non-farm jobs. The figure reveals several interesting patterns. First, overall migration to the United States increased sharply.

Combining farm and non-farm migration, the share of villagers working in the United States increased from 5.8% in 1980 to 16.5% in 2002. The trends are quite different, however, for the two sectors. While the share of villagers migrating to farm and nonfarm jobs was nearly the same in 1980, migration to non-farm jobs increased much faster than to farm jobs. Nevertheless, a slight increasing trend is evident in migration to farm jobs as well. The fraction of villagers migrating to farm jobs increased from 2.7% in 1980 to 4% in 2002. The question we explore is 'what role, if any, did the policies play in this trend?'

Findings and Discussion

What would migration to U.S. agriculture have looked like in the absence of the three policies described above? To answer this question, we econometrically model the dynamics underlying the farm labor migration curve in Figure 1. We do

5. *Some of the Mexico sample-based studies include Cornelius, 1989; Donato, Durand, & Massey, 1992; Orrenius and Zavodny, 2003.*

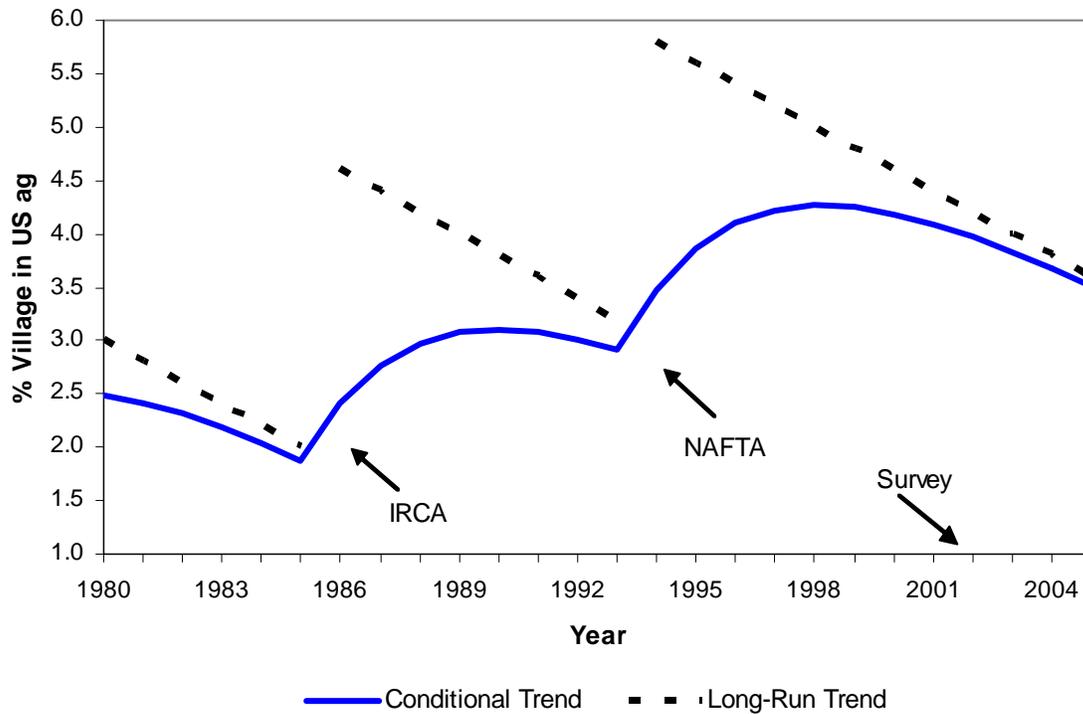


Figure 2. Conditional migration trends to U.S. agriculture.

this using a standard dynamic panel technique in which the current share of villagers in U.S. farm jobs depends on the past share, a time trend, other variables affecting the economic returns and costs of migrating, and variables measuring the three policy changes. This method makes use of both the time series and cross-sectional variation in the data. We test whether the migration trend changed significantly in years when U.S. border enforcement expenditures increased and in 1986 and 1994 when IRCA and NAFTA, respectively, were implemented.

Two main findings emerge from the analysis. First, once we control for other variables shaping migration, increases in border enforcement expenditures do not affect migration to U.S. farms. This suggests that border enforcement, even if it increases the odds of apprehension on a given

attempt to cross the border, does not deter new immigration. An alternative explanation is that increased enforcement decreases new migration, but also deters return migration by those already in the United States who anticipate a more difficult re-entry in the future.

The second major finding is that the upward trend in farm labor migration evident in Figure 1 was, in fact, policy induced. Without IRCA and NAFTA, the trend would have been negative; that is, over time, the share of rural Mexicans migrating to work on U.S. farms would have decreased. Figure 2 isolates the impacts of IRCA and NAFTA. The downward sloping dotted lines show that in the medium to long run there is a tendency for migration to farm jobs to decline. This decreasing trend, however, was temporarily interrupted first by IRCA and then

by NAFTA. The solid curve shows that each policy was associated with about a one percentage point increase in the share of villagers migrating to U.S. farm jobs over the four-year period following the policy's implementation. This represents nearly a 40% increase compared to pre-policy levels.

The finding that farm labor migration increased after IRCA suggests that the SAW legalization program created a stimulus for migration that outweighed the deterrent effect of employer sanctions for hiring unauthorized workers. There are three ways in which legalization may have increased farm migration. First, family reunification invariably follows legalization. This would bring new migrants from rural Mexico into rural areas of the United States and possibly into farm jobs. Second, there may have been a surge in new migra-

tion to apply for easy legalization under the SAW program. Third, the SAW program may have sent a message to rural Mexicans that working on U.S. farms could provide access to future legalization programs.

Interpreting the positive effect of NAFTA on farm migration is difficult because of the many complex changes underway in Mexican agriculture and the overall economy. Nevertheless, an increase in migration is consistent with agricultural production and productivity trends in Mexico. Both Mexico's agricultural exports and its grain imports increased sharply after it joined NAFTA. At the same time, Mexico's export agriculture became more capital intensive, resulting in an overall decrease in farm employment. For example, in 2002, Mexican agriculture produced 15% more output with 10% fewer workers than in 1991 (Taylor, 2003). The bottom line is that, for rural Mexicans lacking the human capital to transition into nonfarm sectors, NAFTA and related reforms may have increased the incentive to migrate to the United States in search of farm work.

Migration and the Future of Agricultural Labor Markets

This analysis raises interesting and critical questions for agricultural labor markets in the United States. We are now more than ten years after the implementation of NAFTA. Figure 2 suggests that the initial increase in migration to U.S. farms that was associated with NAFTA has played itself out, and the long-run trend of decreasing agricultural labor migration is reasserting itself. This is consistent with recent increases in real agricultural wages and reports of labor scarcity on farms (*Rural Migration News*, 2006). In light of this,

farmers and policymakers face two alternatives. One alternative is to take new measures to increase the supply of foreign labor. This option is controversial, as reflected by the heated debate over legalization provisions in current immigration reform proposals. Our findings suggest that, with or without immigration reforms, the trend in supply of labor from rural Mexican households to U.S. farms is decreasing. This raises questions concerning the long-run feasibility of using gatekeeper policies to increase this labor supply. The other alternative is to allow farmers to adjust to a tighter labor market via labor-saving technologies and farm management practices. The choices that are made will have far reaching ramifications for farmers and farm workers in the United States, as well as for households in rural Mexico.

For More Information

Banco de Mexico. (2006). Remesas familiares. Available online: <http://www.banxico.gob.mx/eInfoFinanciera/FSInfoFinanciera.html>.

Boucher, S., Smith, A., Taylor, J.E., & Yúnez-Naude, A. (2007). Impacts of policy reforms on the supply of Mexican labor to U.S. farms: New evidence from Mexico. *Review of Agricultural Economics*, 29(1), 4-16.

Cornelius, W.A. (1989). Impacts of the 1986 U.S. Immigration Law on emigration from rural Mexican sending communities. *Population and Development Review*, 15, 689-705.

Donato, K.M., Durand, J., & Massey, D.S. (1992). Stemming the tide? Assessing the deterrent effects of the Immigration Reform and Control Act. *Demography*, 29, 129-157.

Martin, P.L. (July 1994). Good intentions gone awry: IRCA and U.S. agriculture. *The Annals of the Academy of Political and Social Science*, 534, 44-57.

Mines, R., Gabbard, S., & Steirman, A. (April 1997). A profile of U.S. farm workers. Demographics, household composition, income and use of services. Washington, DC: U.S. Department of Labor, Office of the Assistant Secretary for Policy.

Orrenius, P.M., & Zavodny, M. (2003). Do amnesty programs reduce undocumented immigration? Evidence from IRCA. *Demography*, 40, 437-450.

Passel, J.S. (2006). The size and characteristics of the unauthorized migrant population in the U.S. Estimates based on the March 2005 Current Population Survey. Pew Hispanic Center Research Report, March 7. Available online: <http://pewhispanic.org/reports/report.php?ReportID=61>.

Public Policy Institute of California. (2002). Has increased border enforcement reduced unauthorized immigration? Research Brief, Issue #61.

Rural Migration News. (April 2006). Farm labor shortages. *Rural Migration News*, 13(2). Available online: http://migration.ucdavis.edu/rmn/more.php?id=1110_0_4_0.

Singer, A., & Massey, D.S. (1998). The social process of undocumented border crossing among Mexican migrants. *International Migration Review*, 32, 561-92.

Taylor, J.E., & Dyer-Leal, G. (2003). NAFTA, trade and migration from rural Mexico. Washington, DC: Carnegie Endowment for International Peace.

United States Commission on
Agricultural Workers. (1992).
Final Report. Washington, DC:
Government Printing Office.
United States Department of Labor.
(March 2005). Findings from the
National Agricultural Workers
Survey (NAWS) 2001 - 2002. A
demographic and employment

profile of United States farm
workers. Washington, DC: U.S.
Department of Labor, Office of
the Assistant Secretary for Policy,
Office of Programmatic Policy,
Research Report No. 9. Available
online: [http://doleta.gov/
agworker/report9/toc.cfm](http://doleta.gov/agworker/report9/toc.cfm).

*Stephen R. Boucher (boucher@pri-
mal.ucdavis.edu) and J. Edward
Taylor (taylor@primal.ucdavis.edu)
are Assistant Professor and Professor,
respectively, Department of Agricul-
tural and Resource Economics, Uni-
versity of California, Davis (UC-
Davis), CA, and are both members of
the Giannini Foundation of Agricul-
tural Economics.*



Immigration Reform, Agriculture, and Rural Communities

by Philip Martin

JEL Classifications: J61, J48, J08

The farm workers of tomorrow are growing up today outside the U.S., making immigration policy a major concern of farmers who hire workers and the agricultural communities in which immigrant farm workers increasingly settle. Farmers have relied on waves of newcomers to fill especially seasonal jobs for the past 150 years in California, but immigrant farm workers have, over the past two decades, spread throughout the United States. According to the National Agricultural Workers Survey (NAWS), most hired farm workers were born and educated abroad, and most are not legally authorized to be employed in the United States.

In the mid-1980s, when perhaps a quarter of the farm workers in states such as California were unauthorized, a last-minute compromise between farm employers and worker advocates allowed 1.1 million Mexicans, a sixth of the adult men in rural Mexico, to become legal immigrants under the Special Agricultural Worker legalization program of the Immigration Reform and Control Act (IRCA) of 1986. IRCA's sanctions on employers who knowingly hired unauthorized workers were expected to halt illegal migration, and farmers were expected to raise wages and improve conditions in order to retain legal workers. Fears of labor shortages prompted a new survey, the NAWS, and an easy-entry guest worker program to quickly provide additional workers, the never-implemented Replenishment Agricultural Worker program.

In fact, IRCA accelerated unauthorized migration, and Latino immigrant farm workers spread throughout the U.S., from seasonal jobs on farms to construction, service, and manufacturing jobs in rural and agricultural areas (Martin et al., 1995). Today, seasonal farm jobs continue to serve as a port of entry for newcomers from abroad, increasing the risk of a sudden change in the availability

and cost of farm workers in the event of enforcement of existing or revised immigration laws. At the same time, many workers and their families are unsure of their future in the U.S., while the communities in which they live struggle to cope with growing numbers of foreigners and do not know if they are sojourners or settlers. Rising numbers of unauthorized foreigners, as well as agreement that the status quo is not optimal, have increased pressures for immigration reform.

Immigration Reform

In March 2005, there were 37 million foreign-born U.S. residents, including 31% naturalized U.S. citizens, 39% legal immigrants and nonimmigrants such as foreign students and legal temporary workers, and 30% unauthorized. The increase in the number of unauthorized workers has been especially fast in recent years, with the estimated number of unauthorized foreigners rising faster than the number of legal immigrants in some years.

Opinion polls find that most Americans want additional steps taken to prevent illegal migration. A December 2005 *Washington Post*-ABC News poll reported that 80% of Americans think the federal government should do more to reduce illegal immigration, and 56% agree that unauthorized migrants hurt the United States more than they help it (Balz, 2006). An April 2006 *Los Angeles Times* poll found that 63% of Americans favored stepped-up enforcement, as well as a guest worker program to deal with illegal migration, while 30% favored stepped-up enforcement only (Barabak, 2006).

The House and Senate took distinctly different approaches to illegal migration in 2005-06. The House, in December 2005, approved the Border Protection, Antiterrorism, and Illegal Immigration Control Act (H.R. 4437)

Table 1. Status of foreign-born U.S. residents, March 2005.

	Percent	Millions
Naturalized U.S. Citizens	31%	11.5
Legal immigrants and nonimmigrants	39%	14.4
Unauthorized	30%	11.1
Total	100%	37

Source: Passel, 2006, p. 3.

on a 239 to 182 vote. It takes an enforcement-only approach to unauthorized migration, calling for mandatory screening of newly hired, as well as existing employees, to ensure they are legally authorized to work in the United States and adding more fencing along the Mexico-U.S. border. It also includes several controversial items, such as making "illegal presence" in the United States a felony, which may make it hard for unauthorized foreigners to eventually become legal immigrants. The House bill does not include a guest worker or legalization program, under the theory that enforcement should be proven effective before additional migrant workers arrive legally and before the government deals with unauthorized foreigners in the United States.

The Senate approved the Comprehensive Immigration Reform Act of 2006 (S2611) in May 2006 on a 62-36 vote. It too contains measures that would increase border enforcement and require employers to verify the legal status of their employees by submitting information to a new government database. However, the Senate bill also includes new earned legalization and guest worker programs, the "comprehensive" approach favored by President Bush.

The major legalization provisions would allow unauthorized foreigners in the United States at least five years to become "probationary

immigrants" by proving they had worked in the United States paid any back taxes and a \$1,500 fee, and passed English and background tests. At the end of six years of continued U.S. work and tax payments and another \$1,500 fee, these probationary immigrants could earn regular immigrant visas. Unauthorized foreigners in the United States for two to five years would have to satisfy the same requirements, but in addition, return to their countries of origin and re-enter the United States legally. Those in the United States less than two years would be expected to depart, although they could return legally as guest workers.

The Senate bill has two new guest worker programs. Under the proposed H-2C program, employers in any U.S. industry could "attest" that they need migrants and that the employment of migrant workers "will not adversely affect the wages and working conditions of workers in the United States similarly employed." Foreigners outside the United States with job offers from such U.S. employers could pay \$500 and obtain six-year work permits. Employers could apply for immigrant visas on their behalf of H-2C visa holders after one year of U.S. employment, and H-2C visa holders could apply for immigrant visas on their own after four years of U.S. work and passing an English test.

The second new guest worker program, the Agricultural Job Opportunity, Benefits, and Security Act (AgJOBS), would allow up to 1.5 million unauthorized foreigners who did at least 150 days or 863 hours of farm work during the 24-month period ending December 31, 2006 to obtain a blue-card probationary immigrant status (this information is for S340 and HR371, AgJOBS as introduced January 10, 2007). Blue-

card applicants must pay an application fee as well as a \$100 fine, and apply in the period between seven and 18 months after enactment.

Blue-card holders could earn an immigrant status by doing (1) at least 150 days (at least 5.75 hours) of farm work during the first three years, (2) 150 days of farm work per year for three years and 100 days in one year in the first four years, or (3) 100 days of farm work a year during the first five years. Blue-card holders could also do nonfarm work and travel in and out of the United States. After proving that this farm work was done and that income taxes were paid, blue-card holders could pay \$400, plus an application fee, and apply for immigrant status for themselves and their immediate families. Blue-card workers are eligible for UI and EITC benefits, but not welfare benefits such as Food Stamps.

The House bill makes reducing illegal immigration and employment its top priority and does not deal with unauthorized foreigners in the United States or employer requests for new guest worker programs. Some House leaders have suggested that, as new enforcement measures make life more difficult for unauthorized foreigners, some will depart on their own, and eventually the smaller number that remains could be legalized.

The Senate bill involves a three-legged stool of enforcement, guest workers, and legalization. No one knows how its components might interact to affect farm workers and farm labor markets. For example, would legalization lead to a new industry creating work histories of at least two years or 150 days of farm work, or would immigration adjudicators tap into administrative data systems such as those for unemployment insurance to determine work

done? Would workers without documentation leave the United States, or would they go further underground in the U.S. economy, perhaps complicating the enforcement of labor and tax laws?

Implications for Agriculture

Some 555,000 U.S. farms reported hiring workers in the Census of Agriculture (2002), with the largest 10% reporting 60% of all workers hired.¹ These workers are both newcomers to the farm labor force, meaning they had their first U.S. farm job less than 12 months before being interviewed, as well as more established workers. Newcomers interviewed by the National Agricultural Workers Survey (NAWS) are almost all unauthorized; a higher percentage of established farm workers are legally authorized to work in the U.S. Newcomers have about 10% lower earnings, reflecting both their lack of experience and unauthorized status.

Newcomers were in the United States less than 24 months and employed in U.S. agriculture less than 12 months before being interviewed.

Farmers worry about what will happen if the influx of unauthorized workers slows as a result of stepped up border and interior enforcement. The turnover rate among farm work-

1. *The 2002 Census of Agriculture reported 554,434 farms hired 3 million workers and paid them \$18.6 billion; the 55,431 farms that hired 10 or more workers hired 1.8 million workers. Workers are reported by each farm on which they are employed, making COA data counts of farm jobs, but these "direct-hire" data exclude workers brought to farms by intermediaries such as labor contractors.*

Table 2. Newcomer and established farm workers, 1993-2000.

Unauthorized (%)	Newcomer			
	1993-94	1995-96	1997-98	1999-00
California	91	97	96	99
Other U.S.	99	100	100	97
Established Farm Workers				
California	31	32	30	49
Other U.S.	35	35	40	39
Average Hourly Earns(\$)	Newcomer			
California	5.02	5.35	5.53	6.13
Other U.S.	5.34	5.09	5.43	6.01
Established Farm Workers				
California	5.78	5.72	6.25	6.81
Other U.S.	5.48	5.79	6.02	6.88

Source: NAWS.

ers is at least 15%, meaning that only 85% of the workers employed one year are also employed the next. If enforcement stopped newcomer entries, farmers could turn to guest worker programs to obtain workers.

The current H-2A program presumes that U.S. farmers will normally find sufficient U.S. workers to fill farm jobs. Farmers anticipating too few U.S. workers can ask the U.S. Department of Labor to certify their need for foreign workers, which occurs after supervised recruitment efforts and inspection of housing for out-of-area workers. Requesting H-2A workers alerts unions and advocates, who sometimes sue employers for not hiring U.S. workers who respond to the (required) farmer's ads. Advocates often raise questions about the need for foreign workers in areas with double-digit unemployment rates. Even though over 95% of farm employer requests for H-2A workers are certified by the Department of Labor, many farmers say the program is "unworkable."

Farmers want three major changes in the H-2A program that are included in the AgJOBS provisions of the Senate bill. First, they want attestation to replace certification. Under attestation, employers

control the border gate by making assertions to the government that they have vacant jobs and are paying the prevailing wage, foreign workers arrive, and enforcement responds to complaints. Second, farm employers want to pay a housing allowance of \$1 to \$2 an hour rather than provide the free housing required under the current program.

Third, farmers want to eliminate or freeze the Adverse Effect Wage Rate (AEWR), the minimum wage they must pay to legal guest workers, \$9 an hour in 2006 in California.² The AEWR is usually the highest of the three wages farmers must offer: the federal or state minimum wage, the prevailing wage, or the AEWR. AgJOBS would freeze the AEWR at its 2003 level, \$8.44 an hour in California, for three years while it is studied. Rolling back the AEWR to its 2003 levels could save current users of H-2A workers 5-7% on wages and

2. *The AEWR is higher than the wage offered to many farm workers because it includes the earnings of piece rate workers, who have higher hourly earnings but work fewer hours.*

make it easier for more farmers to begin hiring H-2A workers.

Farmers confronting increased production and marketing risks realize that the rising share of unauthorized farm workers adds another risk to their operations. The rising labor risk is being dealt with primarily by investments in the political process, as farmers try to convince policy makers that they need legal workers at current costs if steps are taken to reduce illegal immigration. Despite reports of farm labor shortages over the past few years, plantings and sales of labor-intensive crops have continued to increase.

Implications for Communities

The typical newly arrived seasonal farm worker is a 25-year old male from rural Mexico who is not authorized to work in the United States (NAWS). While in the United States, newcomer farm workers earn an average \$8 an hour for 1,000 hours of farm work, earning about \$8,000 (the 2006 poverty line is \$9,800 for one and \$20,000 for a family of four). Many workers form or unite families in the United States, especially as they move up the U.S. job ladder to less seasonal nursery, livestock, or farm-related processing and packing jobs.

Young immigrant workers soon have U.S.-born children, which means that immigrant families in rural and agricultural areas are often mixed in the sense that some members are unauthorized, some may be legal, and others may be U.S. citizens by birth. Eligibility for public services is uneven, with all children obliged to attend K-12 schools, but only legal low-income U.S. residents are eligible for means-tested benefits such as Food Stamps, Medicaid, and other assistance. Since many farm

and rural employers do not provide health insurance and other work-related benefits, there can be impacts on local emergency rooms as immigrants and their families seek services and are unable to pay bills. Many rural areas are not expanding public services, making it more difficult to add bilingual services that educate newcomers about their rights and responsibilities (*Rural Migration News*, Quarterly; Pfeffer and Parra, 2005).

Immigration has always meant change, from the number and characteristics of the people living in an area to new patterns in housing, culture, sport, and ways of life. In some rural areas, the choice may be to diversify or depopulate, since local industries may shrink or shut down without immigrant workers. In other areas, immigrants swell populations and introduce new forms of mobility to rural America. Instead of local young people leaving rural areas for college, immigrants may arrive to fill entry-level jobs that the U.S.-educated children reject. The result can be an immigration treadmill, as some rural employers depend on a continued infusion of newcomers, while some local residents resent the changes that accompany immigration.

Agriculture is associated with both the “positive externalities” of preserving open space and providing a living link to the founding fathers and “negative externalities” associated with items from waste disposal to water pollution. Without new private-public partnerships to share the costs of integrating migrant workers and their families, an increasing immigrant work force could come to be seen as a new negative externality associated with farming and processing. Some evidence of such community reactions is already evident in

Midwestern cities that rejected opening or re-opening meatpacking plants because of their fear of an influx of migrant workers.

Turning immigrants into a positive externality in rural and agricultural America requires leadership and commitment from employers, community leaders, and the immigrants themselves, but this leadership is unlikely to be forthcoming until the legal status of the foreigners is clarified. Rural America’s voice in the current immigration debate has been dominated by farm and other employers seeking to legalize access to a continued inflow of migrants. Rural leaders who do not directly benefit from such migration may have to decide if guest workers or immigrants are in the best interest of their communities. A guest worker future would mean more solo men living in temporary quarters while they work in the United States, allowing significant production facilities in areas with relatively few families. An immigrant future would mean more families and an associated integration challenge.

Conclusions

Farmers and farm-related industries increasingly rely on foreign-born workers to fill mainly entry-level jobs. Many and perhaps most of these immigrant workers are unauthorized, increasing risks of sudden changes in labor costs in what is already a risky business and complicating integration efforts in rural America.

Today’s immigration reform debate has important implications for farmers, farm workers, and rural communities. There are three major options: status quo, enforcement only, and enforcement plus guest workers and legalization. The status

quo gets agriculture and associated industries a labor force, but with growing risks and externalities that are increasingly perceived as negative by most Americans. Enforcement threatens to raise labor costs and force adjustments, most likely unevenly across rural areas. Enforcement, coupled with guest workers and legalization, would potentially open a new era for rural America. If history repeats itself, legalization of unauthorized workers would expedite mobility out of farm and farm-related jobs, with the vacuum filled by guest workers. If the guest workers were allowed to become immigrants, as in the Senate bill, the result could be a significant demographic and economic change in rural America.

For More Information

Balz, D. (2006). Political splits on immigration reflect voters'

ambivalence. *Washington Post*, January 3.

Barabak, M.Z. (2006). Guest-worker proposal has wide support. *Los Angeles Times*, April 30.

Martin, P. (2005). AgJobs: New solution or new problem? *U.C. Davis Law Review*, 38(3), 973-991.

Martin, P., Huffman, W., Emerson, R., Taylor, J.E., & Rochin, R., Eds. (1995). *Immigration Reform and U.S. Agriculture*. Berkeley, CA: Division of Agriculture and Natural Resources Publication 3358.

National Agricultural Workers Survey (NAWS). (2005). Findings from the National Agricultural Workers Survey (NAWS) 2001 - 2002. U.S. Department of Labor. Available online: www.doleta.gov/agworker/naws.cfm.

Passel, J.S. (2006). Size and characteristics of the unauthorized migrant population in the U.S. Estimates based on the March 2005 current population survey. Available online: <http://pewhispanic.org/reports/report.php?ReportID=61>.

Pfeffer, M., & Parra, P.A. (2005). Immigrants and the community: Farmworkers with families. Cornell University. Available online: http://rnyi.cornell.edu/poverty_and_social_inequality/. *Rural Migration News*. Quarterly. Available online: <http://migration.ucdavis.edu/rmn/index.php>.

Philip Martin (martin@primal.ucdavis.edu) is Professor, Department of Agricultural and Resource Economics, University of California-Davis, Davis, CA.



The Impact of Immigration on American Workers and Businesses

By Ethan Lewis

JEL Classifications: J2, J43

Immigration policy has become a vigorously debated topic in Washington. Strident demands for more restrictive policies and criminalization of illegal immigration are clashing with proposals to expand the number of temporary work visas and preserve America's traditional openness to immigration. In the meantime, surveillance along the Mexican border has been substantially increased. Farmers, many of whom depend heavily on undocumented Mexican labor, are understandably nervous and claim that the border crackdown is already leading to labor shortages.¹

This article describes what role immigrants play in the U.S. economy and what economic impact they have on the United States. It examines immigration broadly, but because of its importance to the farm sector, special attention is given to Mexicans, who make up one-third of recent immigrant arrivals and over half of farm sector labor. Economists' research suggests that workers, consumers, and businesses likely benefit from higher immigration, but this is traded against potentially adverse distributional consequences for low-skilled Americans. However, most estimates suggest that the harm to low-skilled Americans is small. One reason for this seems to be that employers are able to adapt their production techniques to the types of workers that are available.

1. For example, a recent *Wall Street Journal* article featured a lettuce farm on a border town in Arizona, which claimed it was unable to fully harvest its crop as a result of the border crackdown (Jordan, 2005) and a recent *Associated Press* headline asserted directly, "U.S. Farmers Facing Labor Shortages" (Johnson, 2007).

Immigrants in the U.S. Economy

A factor likely contributing to clashes over immigration policy is the rapid growth in the sheer volume immigration, particularly from Mexico. Figure 1 shows the number of immigrants coming to the United States in each year of the post-war period and the proportion who are from Mexico.² Since the 1970s, Mexican immigration has dominated these inflows. Migrants from Mexico, many undocumented, now represent one-third of new immigrants.

Immigrants, and especially Mexican immigrants, tend to be less skilled compared to native-born Americans. One way to illustrate this is with their levels of education. Table 1 shows that one-third of all immigrants, and over two-thirds of Mexicans, never complete high school (many Mexicans, in fact, never attend high school), compared to only 16% of native-born Americans. Nevertheless, many other immigrants are also highly skilled; a larger proportion of immigrants than natives have advanced degrees.

Mexicans' skills are also reflected in the sectors in which they work. According to the Census, a disproportionate share of Mexicans (compared to natives) work in agriculture, construction, manufacturing, and retail (mostly restaurants). From the point of view of the industry, Mexicans are most important to agriculture. Table 2 shows that roughly half of all workers and three quarters of new hires in agriculture were undocumented Mexican immigrants.³ In California, the numbers are even starker: 93% of new hires are undocumented Mexican immigrants. It is understandable, therefore, that farmers would

2. These figures are from the Census, which a number of studies have shown capture most illegal immigrants (e.g., Van Hook and Bean, 1998), in addition to legal immigrants.

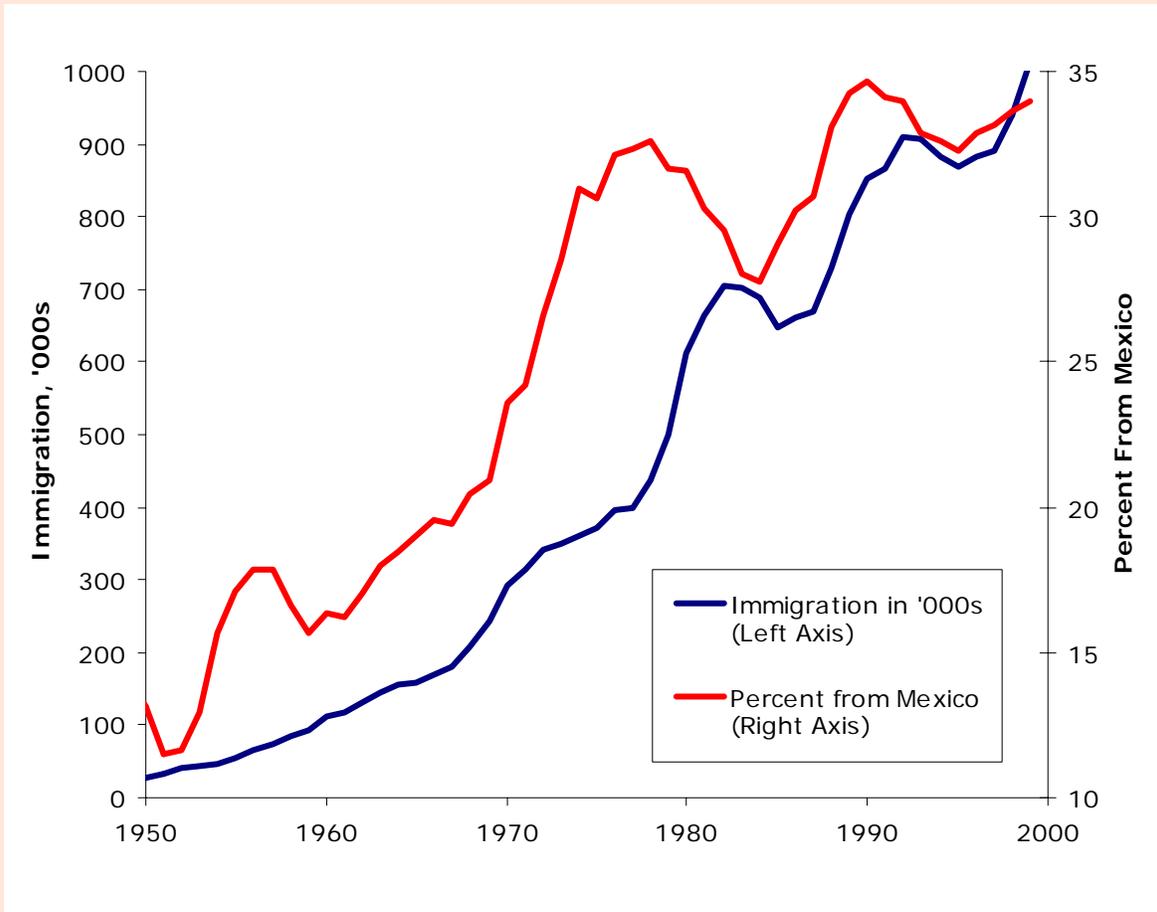


Figure 1. Number of immigrants and percent from Mexico by year of arrival (from 2000 Census of Population, based on five-year moving average).

be concerned about an increase in border enforcement.

Another feature of recent immigration, which may contribute to policy clashes, is the dispersion of immigrants to parts of the country that have little recent experience with immigration. Some markets, especially in the Southeast and West, have experienced rapid changes in their ethnic mix as they have gone from being places that receive virtually no

3. *New hires are highlighted because they are likely to be more vulnerable to a border crackdown. Each year, 5-10% of farm workers are new hires.*

immigration to being new major immigrant destinations. In a recent paper, David Card and Ethan Lewis (2005) showed Mexican immigration has experienced a similar geographic dispersion, as fast job growth in the Southeast and other parts of the West have lured Mexicans away from traditional strongholds.⁴ Traditionally, over 60% of Mexicans have settled in

4. *For example, during the 1990s, the number of Mexican immigrants in Phoenix, Las Vegas, Atlanta, Denver, Austin, Portland (WA), Raleigh-Durham, Greensboro, Salt Lake City, and Seattle grew over 300% (Card & Lewis, 2005).*

California, but since 1990, it has been less than half.

Along with the migration out of California, this paper showed Mexicans have shifted significantly out of agriculture towards construction. This sector shift recently received attention when thousands of Mexicans showed up in the Gulf Coast, a traditionally low immigration area, looking for hurricane reconstruction-related employment, but it is actually part of an ongoing shift of Mexicans out of agriculture.⁵ The trend implies that farmers may find it increasingly difficult to recruit Mexican labor regardless of U.S. immigration policy.

Table 1. Education mix of native- and foreign-born workforce, 2000 (from 2000 Census of Population).

Education Level	Native-Born	All Immigrants	Mexican Immigrants
High School Dropout	11.6%	33.7%	66.8%
High School Graduate	28.3%	19.3%	17.9%
Some College, <4 years	33.0%	20.7%	11.2%
4-Year College Degree	17.9%	15.1%	2.7%
Advanced Degree	9.2%	11.2%	1.4%

Table 2. Sources of U.S. farmworkers, 2000-2002 (from the National Agricultural Workers Survey).

	Mexico-Authorized	Mexico-Unauthorized	Other (including U.S.)
All U.S. Farms			
All Farmworkers	24.2%	50.4%	25.5%
New Hires	3.1%	76.2%	20.7%
California Farms			
All Farmworkers	42.8%	50.3%	6.9%
New Hires	2.6%	93.1%	4.3%

Overall Labor Market Impacts

What are the consequences of immigration for the United States? Are we economically better or worse off as a result of immigration? A misconception of some policymakers (or perhaps a position they take for rhetorical convenience) is that each immigrant who gets a job displaces one U.S.-born worker.⁶ Because the scale of the U.S. economy is not fixed, however, this extreme position is unwarranted. Immigrants are not just workers after all, but consumers, and immigrant demand for products and services expands employment.

The story would end there if immigrants had skills in the same proportions as U.S. workers. Because immigrants are disproportionately low skilled, however, Americans ben-

5. *There have been several recent news stories on Mexican labor in the Gulf Coast area, and at least one Associated Press story made the explicit link to hiring difficulties in agriculture (Minor, 2006).*

efit from immigration. Economic theory says that immigration makes other inputs into production – like skilled labor and land – relatively “scarce,” and therefore raises their market value. To put it into concrete terms, if there are more low-skilled workers per acre of land, farmers can harvest more crops per acre of land, so their land is more valuable. U.S. consumers also benefit to the extent that immigrants drive down the cost of goods and services which use a lot of low-skilled labor, such as household production (maids and nan-

6. *For example, in a 2004 Senate hearing Tennessee Senator Lamar Alexander asked “If we have 8.4 million unemployed, according to our official statistics, and if 6 million illegal immigrants are working, are these 6 million taking the jobs that the 8.4 million want? Also, if these 6 million were not here, would we suddenly have virtually full employment?” (Congressional Record, 2004).*

nies). In a recent study, Cortes (2005) studied the impact of immigration on prices in 25 large U.S. metropolitan areas. She found that a 10% increase in immigration lowered the price of “low-skilled intensive” goods and services by 1%. The overall benefits to the U.S. economy are probably not trivial. A 1997 study by the National Research Council estimated that in the mid-1990s, Americans gained between \$1 and \$10 billion per year from immigration’s labor market impacts alone.

Not everyone benefits from immigration. Just as with international trade, the net benefit is positive, but there are both winners and losers. In this case, immigration’s benefits derive from reducing wages in the less-skilled jobs that immigrants take. While the average American will not be harmed by this – relatively few Americans work in low-skilled jobs – immigration may reduce the earnings of some low-skilled Americans. Determining the magnitude of these distributional consequences is the subject of a vigorous ongoing academic debate.

Distributional Consequences

Although simple economic theories say that immigration will push down the wage of less-skilled Americans compared to other types of workers, it does not say how much wages will decline. This is an empirical question.

A large body of research attempts to evaluate immigration’s impact on wages. The most common approach exploits the fact that immigrants are geographically clustered. (For example, 80% of Mexicans historically settled in either California or Texas). These studies compare the labor market outcomes of U.S. natives in markets with more and less immigration.

There have been a large number of studies that have taken this approach. These studies typically examine groups of workers who might plausibly be expected to take similar types of jobs as low-skilled immigrants (for example, African-American high school dropouts). These studies also typically find that the impact of immigration is quite small. A 1995 summary of this research by Rachel Friedberg and Jennifer Hunt concludes, "Most empirical analysis . . . finds that a 10% increase in a fraction of immigrants in the population reduces native wages by at most 1%." One concern could be that wages cannot adjust because of minimum wage laws or union contracts. However, these same studies tend to find immigration does not have much effect on unemployment.

Studies since this 1995 summary have attempted to find narrower groups of Americans whose wages are affected by immigration. A 2001 study by David Card found immigration had a slightly larger impact on the relative wages of natives working in similar types of occupations as immigrants. Cortes (2005) found that the relative wages of native-born Hispanics with low English proficiency were lowered by immigration, but, as in previous studies, African-Americans' wages were not. Many studies (including Card, 2001; Peri & Ottaviano, 2006) find immigration lowers the wages of other immigrants.

The area analysis approach has been criticized as potentially understating immigration's impact due to the fact that immigrants may choose to live in cities with higher wages (or higher wage growth). That is, immigration does not make wages lower in high immigration cities than in low immigration cities; it makes wages

lower than they otherwise would have been in high immigration cities, something which is difficult to assess. One of the more interesting and credible ways researchers have addressed this problem is by examining areas affected by large waves of refugees. Since refugee immigration is arguably not driven by the economics of the markets where the immigrants settle, these events arguably provide good "natural experiments" with which to evaluate the impact of immigration. Card's (1990) evaluation of the impact of the Mariel boatlift on Miami's less-skilled workers was the first to employ this approach. Despite the magnitude of the event – the boatlift increased the number of low-skill workers in Miami (relative to other types) by over 10% in less than a year – Card found little evidence of even any short-run adverse consequences for Miami's low-skilled workers.⁷

Harvard University's George Borjas criticizes the area analysis approach for another reason. He argues that because the U.S. economy is highly integrated geographically, immigration's impact is not limited to the particular areas where immigrants settle, but rather is dispersed throughout the country. As a result, he argues, immigration's impact cannot be evaluated through cross-market comparisons. Instead of

7. *Findings from other refugee studies since have confirmed these results. For example, Kugler and Yuksel (2006) found that Latin American refugees displaced by Hurricane Mitch in 1998 had little impact on the markets in which they settled. Similarly, Hunt (1992) found that a wave of Algerian refugees had little impact on the French labor market.*

comparing across geographic markets, Borjas examines the U.S. as a whole and exploits variation over time and across skill groups in the volume of immigration.

In a widely-cited 2003 paper studying immigration in general, and in a 2005 paper with Larry Katz focused on Mexican immigration, Borjas combines data from several decennial censuses and divides workers into education-work experience-year "cells" (categories). For example, the highest immigration cell in Borjas (2003) is high school dropouts with 16-20 years of experience in 2000 (50% foreign-born); the lowest immigration cell is high school graduates with 1-5 years of experience in 1960 (1.2% foreign-born). Comparing across cells rather than across regions of the country, he finds that native-born workers in cells that experienced larger increases in immigration, also experienced a relatively slower wage growth. His estimates imply an immigration-induced 10% increase in the supply of low-skilled workers reduces low-skilled wages by 4%.

Borjas's approach is not without problems. Bohn and Sanders (2005) find his estimates are sensitive to removing a small number of data points. In essence, the estimated impact appears to largely derive from the fact that there was a decline in the wages of high school dropouts between 1980 and 2000, at a time when many high school dropout immigrants were coming to the United States. It is tempting to link the two events, as Borjas's estimates do, but researchers have identified a number of other phenomena that may also have contributed to the decline, including technological change, increasing trade with the developing world, and a large decline in the real value of the minimum

wage. Borjas does not control for any of these other macroeconomic forces, and his estimates imply that most of the decline in the wages of high school dropouts was due to immigration. In addition, Raphael and Ronconi (2005) show that many of the high immigration experience-education groups are populated by Americans with high incarceration rates (young high school dropouts), which also harms average earning in those cells. Raphael and Ronconi show that once the effects of incarceration are taken into account, the estimated effects of immigration on wages are small.⁸

A different problem for Borjas' finding is that there is little evidence of immigration's impact being geographically dispersed in the way he describes. Two mechanisms underlie the geographic dispersion in Borjas' argument: the movement of people and intercity trade. The idea that these movements should, in the long run, make wages the same in all markets. Empirically, though, neither mechanism appears to be a major source of local labor market adjustment to immigration. Although a recent study by Borjas (2006) shows that native-born Americans expected to compete with immigrants avoid high immigration areas, an earlier study (Borjas, Freeman, & Katz,

8. *On the other hand, Borjas and Abdurrahman Aydemir obtain similar results in Canada and Mexico, countries which have had very different immigration experiences from the United States. In Mexico, in fact, variation comes from workers emigrating to the United States rather than immigration. In Canada, immigrants are disproportionately high skilled, rather than low-skilled.*

1997) found similar estimates were sensitive to what was controlled for. Studies by Card and DiNardo (2000) and Card (2001) find little evidence that intercity migration of American workers dissipates local immigration shocks. The idea that the impact of immigration is geographically spread by native flight is also difficult to square with the simple fact that high-immigration areas tend to have more unskilled workforces.

Lewis (2003) and Card and Lewis (2005) also find little evidence that local immigration shocks are transmitted to the rest of the country through intercity trade. The theory behind the idea is that if immigration pushed down low-skilled wages in one market (say, Los Angeles), then employers in low-skilled industries that make goods that can be traded between markets (like apparel) would flock to that market and bid up wages for low-skilled workers. In fact, changes in industry mix are virtually uncorrelated with immigration flows. Both papers found that movements of industries across metro areas account for less than 10% of immigration-induced skilled mix shocks.

Then How Do Labor Markets Adjust to Immigration?

Although economic theory does not specifically say how much immigration should affect low-skilled wages – only that it should push them down – the small estimates coming out of studies that compare across markets is nevertheless somewhat surprising to many economists. In fact, the size of immigration's impact depends on how similar U.S. and immigrant workers are and on how the economy is able to adapt to immigration.

One reason the impact of immigration might be small is that immigrants and native-born workers, even

in narrow education-experience groups, tend to work in different kinds of jobs. Trejo (1998) shows minimum wage immigrants and natives work in different jobs.⁹ Peri and Ottaviano (2006) show that the overlap in the occupations of immigrant and native-born high school dropouts is no more similar than the overlap in the occupations native-born high school dropouts and native-born high school graduates. Still, the lack of occupational overlap could just reflect the fact that immigrants have displaced natives from certain types of jobs.

Another reason the impact of immigration may be small is that the economy might adjust to immigration in ways economists' models typically do not allow. For example, most models assume the same technology is used in all labor markets, and, related to this, machinery is assumed to be equally useful in substituting for work done by skilled and unskilled workers. In fact, research since Griliches (1969) suggests that machinery substitutes are better for low-skilled tasks than skilled tasks. Models in which technology and the stock of machinery are allowed to adjust more freely to immigration predict a smaller impact of immigration on wages.

To find out how important this is, Lewis (2005) examined the effect immigration has on employers' use of different production technologies and machinery. The paper focused on the use of automation technologies, like robotics, which were first used in U.S. factories during the 1980s. The paper found that in areas where immigration made less-skilled

9. *Trejo found, for example, many of the minimum wage jobs immigrants take were in agriculture.*

labor abundant, plants used significantly less automation technology and less machinery generally than similar factories elsewhere. Similar sorts of adjustments occur in other sectors. Low-skilled immigration also appears to depress the adoption of computers (Doms & Lewis, 2006).

Possibilities for substitution of capital and technology for workers are likely to exist in agriculture as well. Researchers sometimes speculate that the abundance of Mexican labor forestalls greater mechanization (for example, Palerm, 1991). Examples are easy to think of: the Australian wine industry tends to rely on automatic harvesters to harvest their grapes, while California relies heavily on Mexican labor.¹⁰ Future research may uncover exactly how adaptable the farm sector is to shifts in labor mix, but it does seem likely that farmers have some capacity to adapt if the level of Mexican immigration falls either because of increased border enforcement or because Mexicans are moving to other sectors of the economy.

Summary

A boom in immigration to the United States has raised urgent concerns over what our immigration policy should be. In this context, it seems important to understand the consequences of higher levels of immigration for the United States. While the pro-immigrant aphorism “immigrants do jobs natives won’t do” is overstated, it is true that few Americans work in the low-skilled

10. *This is not to say that the reduced mechanization is a bad outcome; on the contrary, it makes more economic sense to harvest crops with labor-intensive methods when labor is abundant.*

jobs that immigrants, especially Mexican immigrants, disproportionately take, such as in agriculture. As a consequence of this, most Americans benefit from immigration. Immigration may reduce the wages of some low-earning American workers who compete with immigrants for jobs, but evidence suggests U.S. labor markets are sufficiently flexible to absorb immigrants without greatly depressing low-skilled Americans’ earnings. One reason for this seems to be that employers are able to adapt their production methods to the available work force, which portends well for their ability to adapt to looming changes in immigration policy.

For More Information

- Aydemir, A., & Borjas, G.J. (June 2006). A comparative analysis of the labor market impact of international migration: Canada, Mexico, and the United States. *NBER Working Paper 12327*.
- Bohn, S., & Sanders, S. (2005). “Refining the Estimation of Immigration’s Labor Market Effects.” Mimeo, University of Maryland.
- Borjas, G.J. (Spring 2006). Native internal migration and the labor market impact of immigration. *Journal of Human Resources*, 41(2), 221-58.
- . (May 2005). The labor market impact of high skill immigration. *American Economic Review*, 95(2), 56-60.
- . (November 2003). The labor demand curve is downward sloping: Reexamining the impact of immigration the labor market. *Quarterly Journal of Economics*, 118(4), 1335-1374.
- Borjas, G., Freeman, R., & Katz, L.F. (1997). “How much do immigration and trade affect

labor market outcomes?” *Brookings Papers on Economic Activity*, pp. 1-90.

- Borjas, G., & Katz, L.F. (April 2005). The evolution the Mexican-born workforce in the United States. *NBER Working Paper 11281*.
- Card, D. (January 2001). Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. *Journal of Labor Economics*, 19(1), 22-64.
- . (January 1990). The impact of the Mariel Boatlift on the Miami labor market. *Industrial and Labor Relations Review*, 43(2), 245-257.
- Card, D. & DiNardo, J. (May 2000). Do immigrant inflows lead to native outflows? *American Economic Review*, 90(2), 360-67.
- Card, D. & Lewis, E. (August 2005). “The diffusion of Mexican immigrants during the 1990s: Explanations and impacts.” *NBER Working Paper #11552*. *Congressional Record*. (2004). 108th Congress, 2nd session. “Calculation of the Employment Rate.” 150(59) S4736-S4737.
- Cortes, P. (November 2005). “The Effect of Low-Skilled immigration on US Prices: Evidence From CPI Data.” MIT Mimeo,
- Doms, M., & Lewis, E. (June 2006). Labor supply and personal computer adoption. *Federal Reserve Bank of Philadelphia Working Paper 06-10*,
- Friedberg, R.M., & Hunt, J. (Spring 1995). The impact of immigrants on host country wages, employment and growth. *Journal of Economic Perspectives*, 9(2), 23-44.
- Griliches, Z. (November 1969). Capital-Skill complementarity.

- Review of Economics and Statistics*, 51(4), 465-468.
- Hunt, J. (April 1992). The impact of the 1962 repatriates from Algeria on the French labor market. *Industrial and Labor Relations Review*, 45(3), 556-572.
- Johnson, M. (2007). "U.S. Farmers Facing Labor Shortages." Associated Press, January 17, 2007.
- Jordan, M. (2005). Crucial ingredient: Growers see threat to 'Winter salad bowl' – Yuma, AZ relies on muscle from illegal immigrants. *Wall Street Journal*, March 11, 2005, p. A1.
- Kugler, Adriana & Yuksel, Mutlu (2006). "Effects of Low Skilled Immigration on U.S. Natives: Evidence from Hurricane Mitch." University of Houston Mimeo, January 2006.
- Lewis, E. (December 2003). Local, open economies within the U.S.: How do industries respond to immigration? *Federal Reserve Bank of Philadelphia Working Paper* 04-01.
- Lewis, E. (May 2005). Immigration, skill mix, and the choice of technique. *Federal Reserve Bank of Philadelphia Working Paper* 05-08.
- Minor, E. (2006). Farmers fret over losing immigrant workers. Associated Press, March 14, 2006.
- National Research Council (1997). *The New Americans: Economic, Demographic and Fiscal Effects of Immigration*. Washington, DC: National Academy Press, 1997.
- Palerm, J.V. (1991). "Farm Labor Needs and Farm Workers in California, 1970 to 1989." California Agricultural Studies, 91-2, Employment Development Department, Sacramento.
- Peri, G., & Ottaviano, G.I.P. (August 2006). "Rethinking the Effects of Immigration on Wages." University of California-Davis Mimeo.
- Raphael, S., & Ronconi, L. (October 2005). "Reconciling National and Regional Estimates of the Effects of Immigration on U.S. Labor Markets: The Confounding Effects of Native Male Incarceration Trends." University of California-Berkeley Mimeo.
- Trejo, S.J. (December 1998). "Immigrant Participation in Low-Wage labor Markets." University of California-Santa Barbara Mimeo. (Author is now at the University Texas-Austin).
- Van Hook, J., & Bean, F.D. (1998). "Estimating Underenumeration Among Unauthorized Mexican Migrants to the United States: Applications of Mortality Analyses." In Mexican Ministry of Foreign Affairs and U.S. Commission on Immigration Reform, *Migration Between Mexico and the United States, Research Reports and Background Materials*. Mexico City and Washington, DC: Mexican Ministry of Foreign Affairs and U.S. Commission on Immigration Reform.

Ethan Lewis is Assistant Professor (ethan.g.lewis@dartmouth.edu), Department of Economics, Dartmouth College, Hanover, NH.



Agricultural Labor Markets and Immigration

By Robert D. Emerson

JEL Classifications: J43, J61, J68

Foreign workers have been an important part of U.S. labor-intensive segments of agriculture throughout U.S. history. Typically, these are specialty crops such as tree crops, vegetables, and nursery and greenhouse crops. Each requires large amounts of labor relative to other resources used in production. Tree crop and vegetable production on only has very large labor requirements, but the requirements are often concentrated into a very short time span of a relatively few weeks, particularly at harvest time. Nursery and greenhouse production has large, but nearly year-round labor requirements. While there has been considerable mechanization in agriculture, a number of fruits and vegetables, particularly for the fresh market, continue to be hand-harvested. Most greenhouse and nursery production utilizes manual labor.

Hired farm employment in the United States is dominated by foreign-born workers: 78% of crop workers were foreign-born in 2001-2002 (Carroll et al., 2005, p. 3). The same report indicated that 53% of crop workers lacked proper authorization to work in the United States during this same time period (p. 6). Most of the recent policy debate has concerned the latter group, the illegal foreign population in the United States. Although agricultural workers are now a small part of this population estimated to be 11.5 - 12 million in 2006, the proportion of workers in agriculture who are illegal is among the highest of any occupation (Passell, 2006). With the major presence of illegal foreign workers in agriculture and the legislative emphasis on illegal foreign workers, there are two sets of economic issues to isolate: 1) the economic effects of a significant augmentation of the workforce through legal immigration, and 2) the economic effects of working in an illegal immigration status. Emphasis is given to the

following economic indicators regarding the agricultural labor market: wage rates, length of time working in agriculture, technology, crop mix, and capital flows.

Economic Issues

Wage Rates

Legal immigrants. While some economists suggest that increased immigration has reduced wage rates for native-born, unskilled workers (Borjas, 2003), most have found negative wage effects of increased immigration extremely difficult to demonstrate once all appropriate adjustments are made. For example, the 1980 Mariel Boatlift from Cuba to Miami increased the Miami labor force by 7%, but had no significant effect on wages of comparable Miami workers (Card, 1990). A second example is the sudden, unanticipated 14% increase in the Israeli labor force by Russian émigrés over 1989-1996, resulting in no significant wage effects in the Israeli economy (Gandal, Hanson, & Slaughter, 2004). These two cases encompass both extremes of the skill distribution of immigrants: the Mariel Boatlift was a relatively low-skilled population, while the Russian emigrants to Israel were a relatively skilled group. Card (2005) summarizes studies based on U.S. data: “. . . although immigration has a strong effect on relative supplies of different skill groups, local labor market outcomes of low skilled natives are not much affected by these relative supply shocks” (p. F321).

The most important economic consideration in absorption of large numbers of immigrants without significant wage effects is that the host country operates as an open economy with minimal restrictions on trade in goods, production resources, and capital. The economic

Table 1. Real average hourly earnings for U.S. agricultural workers: constant (2004) dollars.

Item	1989-1998	1999-2001	2002-2004
Authorized Workers	7.49	7.97	8.31
Unauthorized Workers	6.90	7.26	7.25
Difference			
Dollars	0.59	0.71	1.06
% of Authorized	8	9	13

adjustments mitigating the wage effects are technological change, changes in the output mix of the economy, and the employment of additional factors of production complementary to the additional labor (Gandal, Hanson, & Slaughter, 2004; Freeman, 2006).

Unauthorized workers. Not only are most hired workers in agriculture foreign-born, but over half are unauthorized for work in the United States. Although there may be no significant wage effects from immigration, there are likely to be significant wage differences between authorized and unauthorized workers. The average earnings reported in Table 1 suggest sizeable differences in reported hourly earnings by authorized and unauthorized workers. Observed differences were 8 and 9% for the periods 1989-1998 and 1999-2001, respectively. Following 2001, however, real hourly earnings for unauthorized workers fell 13% below authorized worker earnings for the 2002-2004 period.

There are a number of reasons why the earnings of groups of workers could differ. For example, they may have different levels of experience, they may be of different age groups or gender, or they may be doing different types of work, etc. A standard way to address the question and isolate the effect of legal status, is to utilize the observed earnings of different types of workers to predict

their earnings in each legal status while holding all other worker and job characteristics constant. Estimates based on the 1989-2004 NAWS data for various combinations of worker and employment characteristics are summarized in box 1. Estimates suggest a wage penalty of 11% after 2001 for a typical illegal worker in agriculture. The wage penalty is much higher for skilled workers, but most agricultural workers are unskilled, not skilled.

The estimated wage penalties summarized in box 1 are qualitatively similar to earlier research by Taylor (1992) and Isé and Perloff (1995). The estimates are also in line with an estimated wage penalty of 14% to 24% for the broader labor force based on legalization under the General Legalization Program of the 1986 Immigration Reform and Control Act (IRCA) (Kossoudji & Cobb-Clark, 2002).

The ultimate question is what will happen to wage rates in agriculture under alternative immigration policy scenarios? Suppose for the moment that there are no changes in technology with the change in immigration policy so that the structure of labor demand by agriculture remains unchanged. With full legalization of unauthorized workers and access to guest workers, market-determined wage rates would be expected to remain at the level they currently are for legal workers; the only difference would be the absence of a wage pen-

Box 1. Estimated wage penalties for lack of legal status*

- 11% after 2001 for a typical illegal worker in agriculture (unskilled, employed directly by a grower, paid hourly, and working in California).
- As large as 23% of the predicted authorized wage.
- Two to three times larger in many cases following 2001 compared to 1989-2001.
- Two to three times larger for skilled work than for unskilled work.**
- Larger for piece rate work than for hourly wage work.
- Smaller for workers employed by labor contractors than for workers employed directly by growers.

**Iwai et al., 2006a. For ease of comparison with other estimates in the literature, these and subsequent wage effects have been converted to the estimated penalty as a percentage of the wage as an authorized worker. In Iwai et al. (2006a), the effects were expressed as estimated premium for being legal as a percentage of the predicted wage as an unauthorized worker.*

***The Iwai et al. (2006a) definition for a skilled worker was someone doing supervisory work.*

alty for the formerly illegal workers.¹ The direct wage cost would clearly be

1. Note that the farm wage is largely determined by the nonfarm wage, and as noted earlier, research has largely shown that increased numbers of legal immigrants in the economy have had no significant effect on wage rates. Also, as summarized in the following section, research does not suggest an exodus from agriculture with legalization.

higher for employers under this scenario. However, a significant part of the eliminated wage penalty must be interpreted as a risk premium to the employer to compensate for potential losses through: 1) uncertainty about the potential removal of labor at a critical production time resulting from an immigration regulatory change, 2) the potential discovery and removal of illegal workers under existing regulations, or 3) facing penalties from having employed illegal workers. The remainder of the wage penalty is best attributed to the lower opportunity cost of illegal workers resulting from their more limited alternatives in an illegal employment status. The removal of this latter component of the penalty through legalization would result in a higher cost to employers if all workers were legal. However, the opportunity cost component has surely diminished over time as illegal workers have become more widely dispersed throughout the economy (Passell, 2006).

The alternative scenario of full removal of illegal workers, closing the border, and no significant guest worker program could result in increased wage rates in agriculture under the assumption of immobile capital and no changes in production technology or product mix in agriculture or other industries. It is argued below, however, that immobile capital and fixed technology and product mix are unlikely scenarios, and that once these assumptions are relaxed, the wage effects would be greatly reduced or eliminated.

A related issue is the extent to which illegal workers utilize more public services than their tax contributions. Moretti and Perloff (2000) found that participation in welfare programs² by unauthorized farm worker families was 8% in contrast to

27%, 30%, and 42% for citizen, amnesty, and green card farm worker families, respectively. Participation in social insurance programs³ by unauthorized farm worker families was 2% in contrast to 21%, 38%, and 41% for citizen, amnesty, and green card farm worker families, respectively. Their analysis based on the NAWS does not permit a comparison of the tax contributions with service usage. However, since most pertinent tax payments are via payroll deductions or sales tax collections, the general belief is that tax contributions vary little by legal status. Examining the experience for overall U.S. immigration, a National Research Council publication reports that "... the average long-term fiscal impacts of immigration are generally found to be positive under most scenarios..." (Smith & Edmonston, 1997, p. 354). Their analysis included not only welfare and social insurance programs, but all public services, including public education. Important qualifications of their summary statement are the variations by attributes of the immigrants (a negative (positive) impact for immigrants with less (more) than a high school education), and a negative impact on state and local governments in areas of high immigration, but a strong positive impact at the federal level.

Work Duration

Labor availability is a continuing concern by agricultural employers. Labor-intensive specialty crops often have a narrow window when certain activities must be accomplished,

-
2. *AFDC, Medicaid, food stamps, WIC, general assistance, or public housing.*
 3. *Unemployment insurance, disability insurance, or Social Security.*

requiring relatively large amounts of labor at those times, but relatively little labor during the rest of the year. Typically, crops requiring manual labor for harvest are the most time-critical and labor-intensive. The fact that the grower's income from the crop is contingent upon a timely harvest of the crop, the availability of labor at this point is obviously a major concern to the grower. One element of this concern is that currently undocumented workers in agriculture would leave agriculture for alternative employment once they achieve a legal immigration status. Similar concerns at the time of the passage of IRCA resulted in the Replenishment Agricultural Worker program (RAW) of IRCA. The RAW program provided authorization for foreign workers to legally work in agriculture if there were an agricultural labor shortage as determined by the Departments of Agriculture and Labor. Since a shortage was never declared by the Departments, the RAW program was never actually implemented.

Access to foreign workers has been one way that agriculture has attempted to secure a timely labor force. The vast *Bracero Program* (P.L. 78) was operational from 1942-1964 largely in the western states authorizing the migration of labor from Mexico to U.S. agriculture. The H-2A program (and its precursors) for agriculture was initially between the British West Indies and the United States, but more recently has focused on workers from Mexico. Although there were only 7,011 persons with H-2A visas admitted in fiscal year 2005, there were 22,141 in fiscal year 2004; the largest number over the past decade was in fiscal year 2000 with 33,292 persons with H-2A visas admitted (U.S. DHS, 2006, Table 26). The H-2A program clearly

accounts for a very small portion of the agricultural labor force. The program is typically found to be too cumbersome and expensive by growers: "H[-]2A is bureaucratic, unresponsive, expensive, and prone to litigation" (U.S. Congress, 2006).

AgJOBS (Agricultural Job Opportunities, Benefits, and Security Act of 2007, H.R.371, S.340) is a proposed guest worker program for agriculture that has the support of both labor advocates and grower organizations. A similar AgJOBS bill was attached to the U.S. Senate immigration proposal, S. 2611 in the 109th Congress. The distinguishing characteristic of AgJOBS, the *Bracero Program*, and the H-2A program is that each of them ties the worker for varying periods of time specifically to agricultural employment. The former *Bracero Program* and the H-2A program were, and are, strictly for agricultural work with no path to permanent residency in the United States. The proposed AgJOBS offers adjustment to a legal status for existing unauthorized agricultural workers meeting past agricultural work requirements in the United States, and with a possible path to permanent residency. Nevertheless, the initial years have a required period of work in agriculture. Future foreign workers would be permitted through a streamlined H-2A program, but again restricted to agriculture.

The restrictions on legalized workers to work proscribed amounts of time in agriculture stem from concerns by the industry about the availability of labor at critical times. In the context of existing unauthorized workers, the concern is that once authorized for work in the United States, they will leave agriculture for employment in other industries. Research to this point in time does not support this concern.

Existing research indicates that if illegal agricultural workers were to be legalized, their expected length of job would *increase* (Hashida & Perloff, 1996; Tran & Perloff, 2002; Iwai, Napasintuwong, & Emerson, 2005; Iwai, Emerson, & Walters, 2006b). Iwai, Emerson, and Walters (2006b), for example, find that the likelihood of remaining in agriculture upon being legalized ranges from a one percentage point reduction to an *increase* of 7.3 percentage points. Of 32 combinations of worker characteristics considered, only five resulted in a decrease in the likelihood of remaining in agriculture; among these five, only two were realistically relevant combinations. One noteworthy result is that the likelihood of remaining in agriculture generally increased modestly following 2001; correspondingly, the *increases* in the likelihood of remaining in agriculture attributed to a hypothetical legalization were generally smaller after 2001. A somewhat different methodology used by Iwai, Napasintuwong, and Emerson (2005) suggests an increase in job duration of an unauthorized worker of 4.4% upon becoming authorized under a program such as the Seasonal Agricultural Worker (SAW) program under IRCA, or by 3.9% by becoming a permanent resident. The effects are not large, amounting to slightly fewer than three more work days. However, they are *positive* when the concern has been that once legal status is obtained, there would be *less* attachment to agriculture.

Hashida and Perloff (1996) and Tran and Perloff (2002), using data from the 1989-91 NAWS, found qualitatively similar results. A somewhat different approach was taken by Emerson and Napasintuwong (2002), who examined information on the number of years workers

reported having worked in agriculture in the United States. Their results suggested that the expected number of years of work were larger for authorized than for unauthorized workers.

Technology and Labor

U.S. agriculture has a long history of technological innovations, with considerable evidence suggesting that new technologies developed in the United States save labor given a history of relatively abundant land (Hayami & Ruttan, 1970). An early example of agricultural producers responding to changes in the labor market by changing production techniques is the adoption of the mechanical tomato harvester in California. A major source of labor for California agriculture was the *Bracero Program* until its termination in 1964. Schmitz and Seckler (1970) summarize the adoption:

The first 25 harvesters were used in California in 1961. By 1964, 75 were in use; a year later, 250. The number increased to 1,000 in 1967 (Lynch, 1968), when approximately 80 percent of the California acreage was harvested by machines. (p. 570)

The agricultural labor market experience starting in the 1970s through the present time has been the reverse of the termination of the *Bracero Program*: workers have increasingly flowed across the border seeking employment opportunities. Napasintuwong and Emerson (2004), using data for Florida, found that while technology had been labor-saving prior to IRCA, it became labor-neutral following IRCA as foreign-born workers became the dominant labor source for agriculture. In other

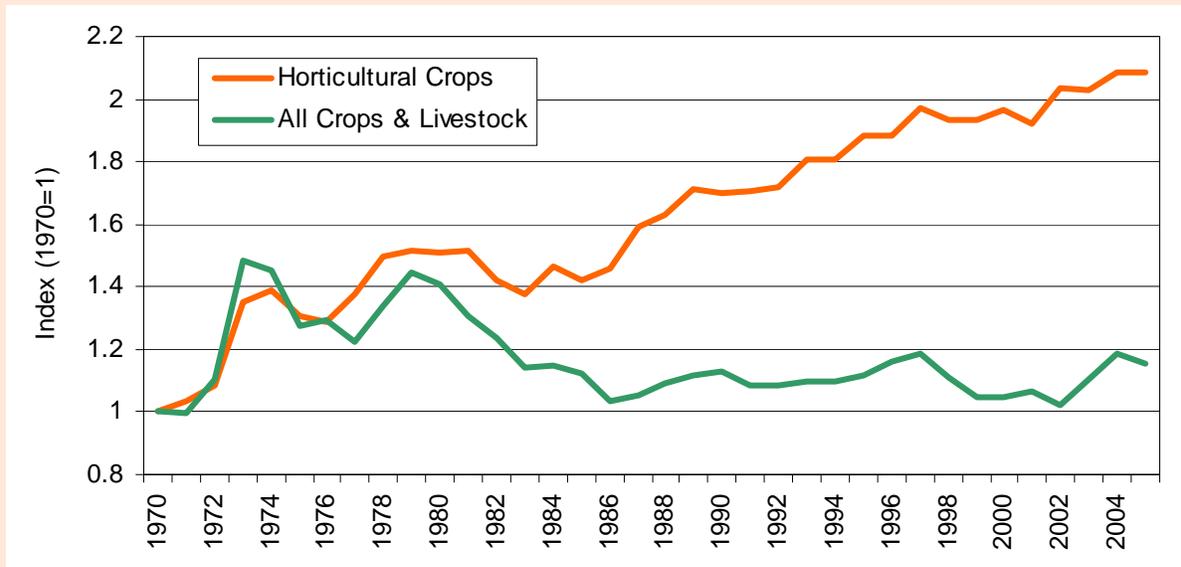


Figure 1. Index of deflated cash receipts for U.S. horticultural crops and all agriculture.

words, technologies employed in agriculture no longer had the effect of continually reducing the quantity of labor relative to other inputs for given input price ratios.

Shifts in technology can also alter the extent to which inputs are substitutable for each other. Napisintuwong and Emerson (2004) found that labor was a substitute for capital throughout most of the time period, but from the mid-1980s through the early 1990s, there was some indication that labor and capital were complements when viewed as changes due to a change in the price of capital. The implication is that if more stringent immigration legislation were to stimulate the ready availability of new mechanized technology, and at a lower cost, it would not necessarily follow that the employment of hired labor would decrease. Another interesting finding is that capital and labor are more easily substitutable when returns to labor change than when capital prices change. This implies that it is easier to substitute capital for labor (such as adopting mechanized technology)

when labor becomes more expensive than it is to substitute labor for capital when capital becomes more expensive. In the context of the mechanical tomato harvester noted earlier, once the harvester was adopted in the late 1960s, a larger reduction in the relative price of labor would be required to shift back to hand harvesting than the initial reduction in the relative price of capital required to adopt the harvester.

The substitutability of labor and capital has implications for various forms of immigration policies. For example, a policy sealing the border, deporting all unauthorized workers, and authorizing no guest workers could result in temporarily higher wage rates for agriculture in the immediate term. The Napisintuwong and Emerson (2004) substitutability estimates suggest that such a policy would stimulate the adoption of additional available labor-saving technology, with increased substitution of capital for labor. With a hypothetical 10% increase in the wage rate, their estimates suggest an 18% increase in the capital-to-labor

ratio. By contrast, a less restrictive policy toward foreign workers would reduce the incentives for adopting new mechanical technology, and reduce the extent of substitution of capital for labor.

Crop Mix

In addition to changes in technology, producers also adjust to the relative availability of labor through changes in the mix of crops produced. Deflated cash receipts from horticultural crops (vegetables, fruits and nuts, and greenhouse and nursery crops) in the United States more than doubled from 1970 to 2005 (Figure 1). By comparison, deflated cash receipts for all U.S. crops and livestock increased by less than 16% over the same time period. This shift in production is to be expected in part from increased demand for many horticultural products as consumer income rises. However, the real price for horticultural products *fell* by 20% between 1970 and 1999.⁴ Moreover, since horticultural products are internationally traded goods, domestic demand can be, and

Table 2. Summary of economic issues.

Item	Likely effect relative to <i>status quo</i>	
	Closed border	Legal migration
Wage rates	Minimal to none (wage penalty disappears)	Minimal to none (wage penalty disappears)
Work duration	Minimal	Minimal
Technology	Labor-saving technology developed and adopted	Technology neutral among productive factors
Crop mix	Shift away from labor-intensive specialty crops	No change
Capital flows	Potential production shift to other countries	No change

is, met by a combination of domestic and international supply.

Cash receipts from U.S. horticultural crops represented 21% of all U.S. agricultural cash receipts in 2005; the comparable figure for 1970 was less than 12% (U.S. Department of Agriculture, 2006). However, since horticultural crops are the labor-intensive component of agriculture, they represent a much larger portion of expenditures on labor. Labor expenditures by horticultural farms were 51% of all farm labor expenditures in 2002 (U.S. Department of Agriculture, 2004).

Clearly, the agricultural product mix shifted over this 35-year period toward more labor-intensive commodities. Napasintuwong and Emerson (2004) have found that agricultural technology has become more perishable crop-producing since IRCA, and has become increasingly biased against other types of agricultural products such as the grains and livestock. A restrictive immigration policy of border closure, deportation of unauthorized workers, and autho-

rizing no foreign workers could slow the technology bias toward producing more perishable crops.

Capital Mobility

Coincident with the labor intensive characteristic of specialty crop agriculture is that specialty crop farms tend to be quite large with substantial capital investment. Although fruit and tree nut, vegetable and melon, and greenhouse and nursery farms represent only 9% of all U.S. farms, they represented 26% of U.S. farms with the value of land and buildings exceeding \$10,000,000 in 2002 (USDA, 2004). In the long term there may not be increases in wage rates due to either closing the border or a shift to legal migration. However, the short term effect of a threat to close the border could be an increased risk of labor availability. Furthermore, one mechanism through which market forces result in minimal wage effects is the movement of capital to either other industries or countries where the expected return on capital is higher. One example of this type of capital movement is the shift of some leather leaf fern production from Florida to Costa Rica, Ecuador and Guatemala, ostensibly in reaction to labor market considerations. The result is increased international trade in lieu of labor mobility.

4. *The price index is a quality adjusted price index calculated from data provided by Eldon Ball, and deflated by the GDP deflator. See Ball et al. (1997) for the methodology.*

Summary

Opinions vary widely about the future course of immigration policy in the United States as evidenced by the stark contrast between the House of Representatives bill “Border Protection, Antiterrorism, and Illegal Immigration Control Act of 2005” referred to the Senate in January 2006 (H.R.4437 109th Congress, 2nd sess.), and the Senate bill “Comprehensive Immigration Reform Act of 2006” passed in May 2006 (S.2611 109th Congress, 2nd sess.). H.R. 4437 would close the border, deport all illegal aliens, and offer no provision for guest workers in agriculture or any other industry. S. 2611 would increase border enforcement, authorize a guest worker program, provide a path to permanent residency for guest workers, and incorporate AgJOBS as a subtitle of the act. The House and the Senate were unable to transcend their differences prior to the November elections, choosing not to meet in a Conference Committee. The end result prior to the November elections was the passage by the House and the Senate of a House of Representatives sponsored bill, the Secure Fence Act of 2006 (H.R. 6061), directing the Department of Homeland Security to erect fencing on hundreds of miles of the U.S. – Mexico border. The bill was signed by the President amid verbiage that this was one small component of comprehensive immigration reform. Subsequently, limited funds for fencing were authorized in the Department of Homeland Security’s appropriations bill for fiscal year 2007.

Given the strong differences of opinion on immigration reform, does economics offer any useful guidelines? While economics typically cannot determine which policy approach is best (that is a political choice), it

can provide useful information on the economic effects of alternative approaches. The effects discussed earlier are summarized in Table 2. Considerations particularly relevant for agriculture are offered below.

Closing the Border

Closing the border is frequently discussed as one option in immigration reform. The Secure Fence Act of 2006 takes a step in this direction. However, there is considerable doubt raised in the literature about the effectiveness of previous efforts to reduce the flow of illegal workers across the border (Hanson, Robertson, & Spilimbergo, 2002). At the core of the problem are wage differentials between the United States and Mexico on the order of six to one (Freeman, 2006). When illegal workers are willing to risk their lives for the opportunity to work in the United States, it is highly questionable that fencing or other approaches will achieve the desired end. At best, the approaches can make it more difficult to enter, and therefore a higher risk to potential entrants. But, if immigrants are already willing to pay the ultimate price, the reduction may be less than hoped for by the policy's proponents. Moreover, rising deaths among border-crossers will eventually exceed a politically acceptable level for a "nation of immigrants."

Suppose for the moment that the border were effectively closed, all undocumented workers were deported, and no guest workers were permitted, much as the approach of H.R. 4437 (109th Congress). With the proposed two-year window for removal of illegals, the industry would be likely to adjust quickly to the new environment. Three likely adjustments would be changes in product mix, production techniques, and capital flows. While significant

increases in the relative importance of specialty crops occurred with the inflow of foreign workers since the 1970s, it is questionable that the increase would be extensively reversed. A more likely scenario is that production techniques would adjust to the new environment, adopting more labor-saving technology. There might also be a flow of capital out of some specialty crops to production areas outside the United States.

The remaining question concerns potential changes in wage rates for agriculture under a scenario of no access to foreign workers. The wage rate that agriculture pays is largely dictated by the wage rate paid for unskilled labor in the much larger nonfarm economy. As indicated above, past levels of immigration have been estimated to have only minimal negative wage effects on unskilled native workers; most agricultural employment draws from the unskilled labor market. As long as agriculture employs largely unskilled labor, wage rates are not likely to significantly change in real terms, regardless of the level of foreign workers.⁵ The way that labor earns a premium above the unskilled wage rate is to develop skills that are in demand in the economy, thus moving out of the unskilled labor pool. In the absence of higher productivity, there is little basis to argue that a person's wage will increase. Only if agri-

5. *All workers would now be earning the market wage; the undocumented group would no longer be present earning the market wage less the legal status penalty. To the extent that the legal status penalty is a risk premium for the employer, the employer's cost per worker would remain unchanged.*

cultural employers shift to employ a more highly skilled labor force would the average real wage rate for the industry be expected to change significantly. Although this is a potential outcome of a highly restrictive immigration policy, it is not the same as a wage increase. The *average* wage rates may be higher, but they would be higher because the composition of the labor force had changed to be more highly skilled, on average. The wage rate of unskilled workers would still remain at its nearly constant level in real terms. In this scenario, technology and/or the product mix would have changed to require fewer unskilled workers and relatively more skilled workers. The important point to recognize is that the substitution of skilled for unskilled workers would not be one for one, but rather, fewer skilled workers substituting for a given number of unskilled workers. Consequently, the wage bill would not necessarily increase.

Legal Migration

If some flow of people across the border for work is currently inevitable, the more relevant issue is how to convert this to a legal flow and determine its effects. Legal migratory flows across borders consist of two types: permanent migration, or *immigration*, and temporary migration, technically, *nonimmigrants* of which those entering specifically for work are *guest workers*. Most recent permanent immigrants have been authorized under the family reunification provisions of the 1965 Immigration Reform Act. While most are of working age upon arrival in the United States, their admission is not on the basis of an employer request or a particular job skill. One potential reform would be to increase the number of legal immigrants, and to use employment skills as Canada does as a crite-

tion for entry. Other possibilities are to auction visas to prospective immigrants (Freeman, 2006) to capture some of the gains that immigrants achieve through immigration, and assure that those with the greatest potential and desire are the ones who gain entry for immigration. Regardless of the approach, Congress would have to determine an upper limit to legal immigrants. Recent Congressional proposals have addressed formal immigration through potential paths to permanent residency for existing undocumented workers, their families, and proposed guest workers. There was no political sentiment prior to the November election, if at all, to adopt the latter proposals.

Nonimmigrant guest worker programs are an alternative to permanent immigration and serve as a means of augmenting the labor force typically to meet specific expressed employment needs. They are typically for limited employment duration and incorporate numerous regulations, as in the existing H-2A program for agriculture regulating the terms of employment, and particularly the minimum wage for guest workers and their domestic counterparts at the same employer.

Two sets of guest worker proposals were set forth in the 109th Congress: a general guest worker program, and a program specifically for agriculture (AgJOBS). Both appeared separately in various Senate bills, and both were encompassed in S. 2611. Two features of these proposals have been politically problematic: allowing illegal workers meeting certain requirements to become legal guest workers, and opening a path to permanent residency for guest workers meeting various employment criteria and law-abiding behavior.

A concern specific to agriculture is that if all currently illegal workers

become authorized, there will be an immediate exodus from agriculture to nonfarm jobs. The available evidence on this issue does not support the contention. Perhaps most important is that employment in agriculture is no longer the primary source of employment for illegal workers. Over half are employed in three broad industry groups: construction (20%), leisure and hospitality (17%), and manufacturing (14%) (Passell, 2006). Moreover, available evidence is that illegal workers approach employment in agriculture in the same way that domestic U.S. workers have for generations: few look to manual labor in agriculture as a lifetime career. The present employment pattern with illegal workers does not appear greatly different than it has in the past with domestic workers: they remain in agriculture for a few years and then move on to some other mode of employment. Clearly, there are some who choose to work in agriculture for a lifetime; however, that is not the case for the majority of hired farm workers.

The AgJOBS proposal addresses the industry concern by incorporating required periods of work in agriculture if a formerly illegal worker authorized under the program is to be eligible for continued work in the United States, and subsequently a path to permanent residency. In addition, AgJOBS would maintain a streamlined H-2A program specifically for employment in agriculture. While there are clearly unique aspects of agricultural employment, restricting employment to one industry raises additional concerns. One of the ways that workers address working conditions and wages that they find unsatisfactory is by terminating their current employment and seeking employment elsewhere where working conditions better meet their pref-

erences. Workers who are tied to a single employer or industry have limited ability to address work-related problems. As a result, they tend to be addressed by additional regulations, and often litigation. Freedom of movement by workers among employers and industries may be far more effective than regulations in establishing agreeable working conditions and wages.

In closing, there are two realistic options: do nothing, or establish a legal mechanism for migration. Closing the border is not a viable option: the economic pressures to enter the United States from neighboring countries are simply too great. While doing nothing is always an option, the approach goes against the national fabric of a "nation of laws." Instituting legal mechanisms for migration formalizes the process by removing workers from the shadows and employers from a guessing game about the legal status of their employees. Regardless of the approach taken, research has shown that technical changes in the production process and product mix changes address most of the required economic adjustments, leaving the structure of wages largely unaltered. Workers switching from an illegal status to a legal status will command a higher wage, but it is not unreasonable to argue that employers are already incurring that wage difference as a risk premium due to employees in an illegal work status. The nation gains overall through added economic activity of the temporary or permanent migration augmenting the labor force. The immigrants and complementary factors of production (land, capital, and complementary labor) capture the gains, and substitute labor absorbs any losses. Wage losses through migra-

tion, however, have been extremely difficult to demonstrate.

For More Information

- Ball, V. E., Bureau, J.-C., Nehring, R., & Somwaru, A. (1997). Agricultural productivity revisited. *American Journal of Agricultural Economics*, 79, 1045-63.
- Borjas, G.J. (2003). The labor demand curve is downward sloping: reexamining the impact of immigration on the labor market. *Quarterly Journal of Economics*, 118, 1335-74.
- Card, D. (2005). Is the new immigration really so bad? *Economic Journal*, 115, F300-23.
- Card, D. (1990). The impact of the Mariel boatlift on the Miami labor market. *Industrial and Labor Relations Review*, 43, 245-57.
- Carroll, D., Samardick, R., Bernard, S., Gabbard, S., & Hernandez, T. (2005). *Findings from the National Agricultural Workers Survey (NAWS) 2001 - 2002. A demographic and employment profile of United States farm workers*. Research Rpt. No. 9, Office of Programmatic Policy, Office of Asst. Secretary for Policy. U.S. Dept. of Labor. Available online: http://www.doleta.gov/agworker/report9/naws_rpt9.pdf.
- Emerson, R.D., & Napasintuwong, O. (2002). *Foreign workers in southern agriculture*. Presented at the SAEA Annual Meeting, Orlando, FL.
- Freeman, R.B. (2006). People flows in globalization. *Journal of Economic Perspectives*, 20, 145-70.
- Gandal, N., Hanson, G.H., & Slaughter, M.J. (2004). Technology, trade, and adjustment to immigration in Israel. *European Economic Review*, 48, 403-28.
- Hanson, G.H., Robertson, R., & Spilimbergo, A. (2002). Does border enforcement protect U.S. workers from illegal immigration? *Review of Economics and Statistics*, 84, 73-92.
- Hashida, E., & Perloff, J.M. (1996). *Duration of agricultural employment* (working paper 779). Berkeley, CA: University of California Department of Agricultural and Resource Economics.
- Hayami, Y., & Ruttan, V. (1970). Factor prices and technical change in agricultural development: the United States and Japan, 1880-1960. *Journal of Political Economy*, 78, 1115-41.
- Isé, S., & Perloff, J.M. (1995). Legal status and earnings of agricultural workers. *American Journal of Agricultural Economics*, 77, 375-86.
- Iwai, N., Emerson, R.D., & Walters, L.M. (2006a). *Legal status and U.S. farm wages*. Presented at the SAEA Annual Meeting, Orlando, FL. Available online: http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=19740&ftype=.pdf.
- Iwai, N., Emerson, R.D. & Walters, L.M. (2006b). *Farm employment transitions: a Markov chain analysis with self-selectivity*. Presented at the AAEA Annual Meeting, Long Beach, CA. Available at: http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=23093&ftype=.pdf.
- Iwai, N., Napasintuwong, O., & Emerson, R.D. (2005). *Immigration policy and the agricultural labor market: The effect on job duration*. Presented at the AAEA Annual Meeting, Providence, RI. Available online: http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=18193&ftype=.pdf.
- Kossoudji, S.A., & Cobb-Clark, D. (2002). Coming out of the shadows: Learning about legal status and wages from the legalized population. *Journal of Labor Economics*, 20, 598-628.
- Lynch, D. (1968). The revolution of California tomatoes. *Canner/Packer*, Western Edition, 137, 10A-10F.
- Moretti, E., & Perloff, J.M. (2000). Use of public transfer programs and private aid by farm workers. *Industrial Relations*, 39, 26-47.
- Napasintuwong, O., & Emerson, R.D. (2004). *Labor substitutability in labor intensive agriculture and technological change in the presence of foreign labor*. Presented at the AAEA Annual Meeting, Denver, CO. Available online: http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=14330&ftype=.pdf.
- Passell, J. (2006). *The size and characteristics of the unauthorized migrant population in the U.S.* Research Report. Washington, D.C.: Pew Hispanic Center. Available online: <http://pewhispanic.org/files/reports/61.pdf>.
- Schmitz, A., & Seckler, D. (1970). Mechanized agriculture and social welfare: The case of the tomato harvester. *American Journal of Agricultural Economics*, 52, 569-77.
- Smith, J.P., & Edmonston, B. (1997). *The new Americans: Economic, demographic, and fiscal effects of immigration*.

- Washington, DC: National Academy.
- Taylor, J. E. (1992). Earnings and mobility of legal and illegal immigrant workers in agriculture. *American Journal of Agricultural Economics*, 74, 889-96.
- Tran, L.H., & Perloff, J.M. (2002). Turnover in U.S. agricultural labor markets. *American Journal of Agricultural Economics*, 84, 427-37.
- U.S. Congress House of Representatives. (2006). Oversight Hearing on "The Reid-Kennedy Bill's Amnesty: Impacts on Taxpayers, Fundamental Fairness and the Rule of Law," Committee on the Judiciary. Oral testimony of John Young, Concord, NH. August 24. Available online: <http://judiciary.house.gov/OversightTestimony.aspx?ID=685>.
- U.S. Department of Agriculture (USDA). (2004). *2002 census of agriculture*. Available online: http://www.nass.usda.gov/Census_of_Agriculture/index.asp.
- U.S. Department of Agriculture, Economic Research Service. (2006). *Farm cash receipts, 1924-2005*. Available online: <http://ers.usda.gov/Data/FarmIncome/finfidmu.htm>.
- U.S. Department of Homeland Security Office (DHS), of Immigration Statistics. (2006). *Yearbook of immigration statistics: 2005*. Available online: <http://www.uscis.gov/graphics/shared/statistics/yearbook/YrBk05NI.htm>.
- Robert D. Emerson is Professor (remerson@ufl.edu), Department of Food and Resource Economics and in the International Agricultural Trade and Policy Center, University of Florida, Gainesville, FL. The author has benefited from comments by Nobuyuki Iwai, Andrew Schmitz, John Van-Sickle, Lurleen Walters, and Choices reviewers. Research reported here has been supported through a partnership agreement with the Risk Management Agency, U.S. Department of Agriculture; by the Center for International Business Education and Research at the University of Florida; and by the Florida Agricultural Experiment Station. The author alone is responsible for any views expressed in the paper.*