U.S.-Mexico Economic Integration: Labor Relations and the Organization of Work in California and Baja California Agriculture*

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Abstract: Through a case study of tomato production in Baja California and California, this paper examines the impact of U.S.-Mexico economic integration on the organization of work and on wage trends and labor costs. In contrast to most previous scholarship, which is based on aggregate economic modeling, this paper provides an institutional approach to the study of NAFTA and longer-term U.S.-Mexico economic integration. I explore the impact of cross-border links in capital, product, and especially labor markets on labor costs, worker income, regional competitiveness, and the location of production. The paper demonstrates that in response to differing economic conditions and institutions in California and northwest Mexico, employers choose different labor management strategies, even though they use similar production technologies. In California, growers extract much higher productivity from workers by paying piece rates and are able to externalize the costs of recruiting, transporting, housing, and retaining their seasonal labor force. As a consequence, the binational differential in wages is much greater than the differential in per unit labor costs, Baja’s competitiveness is constrained by low productivity, and downward convergence in workers’ net income is occurring.

Key words: farm labor, labor relations, NAFTA, U.S.-Mexico economic integration, agriculture, tomatoes, horticulture.

This paper compares fresh vegetable production in California and northwest Mexico, with a special focus on tomato production in California and Baja California. Although the North American Free Trade Agreement (NAFTA) has been in effect only since 1994, economic integration, as defined by increasing links in product, capital, and labor markets, started in this sector in the late 1950s, when U.S. tomato producers left Cuba and invested in the Mexican state of Sinaloa for export production to the United States. Peso devaluations, real wage declines, and unilateral trade liberalization by Mexico over the last 15 years have deepened the links between the two economies and have resulted in significant expansion of horticulture production in Mexico for export to the United States. These changes have had a greater effect on the relative costs of production between the United States and Mexico than has NAFTA, which will remove pre-NAFTA tariffs of less than 10 percent of product value over a 15-year phase-in (Cook 1991; Runsten et al. 1993). Production of horticultural products has already been rationalized to take advantage of locational complementarities, and U.S. foreign investment has played a key role in the expansion of production in Mexico (Cook 1988). Over the same period, migration of Mexican workers has also increased, largely in response to the same forces of economic restructuring. Since the signing of NAFTA and the devaluation of

* I would like to thank Anna Garcia, Felipe Cuamea, and Sally Hughes for help conducting field work for this study, and Andrew Morrison, Timmons Roberts, Katherine Donato, Luis Guarnizo, Anne Hornsby, David Runsten, and Dan Ringer for helpful comments on this paper.
the peso in 1994, these links have continued to grow stronger.

This paper analyzes how the specific institutional context on each side of the border shapes the process of economic integration. I demonstrate that in response to differing economic conditions and institutions in California and northwest Mexico, employers choose different labor-management strategies, even though they use similar production technologies. California growers extract much higher productivity from workers by paying piece rates; they are also able to externalize the costs of recruiting, transporting, housing, and retaining their seasonal labor force. Baja growers, in contrast, employ a low-wage, low-productivity management strategy and must incur most of these same nonwage costs. Wages for tomato workers in Baja averaged 88 cents per hour in 1992 and dropped to less than 50 cents in 1995 after the peso devaluation. But the gap in the cost of labor per kilogram of tomatoes harvested between Baja and California is much smaller than the wage gap, owing to differences in labor productivity and in the costs of guaranteeing the availability of labor in the two regions.

The data used in this article come from detailed interviews with tomato workers in California and in Baja California. The Baja study, carried out in 1992 by the author, contains detailed work and migration histories from interviews with 120 indigenous Oaxacan migrant farm workers, the main labor force in the region. The respondents come from a random sample of 73 households living in three labor camps and two farm worker squatter settlements in the San Quintin Valley, Baja’s major horticultural export region. The settlements and labor camps were selected to approximate the distribution of farm workers between labor camps and settlements, as well as to capture the variation in conditions of workers employed on large and small farms in the valley. Interviews were conducted with male and female household heads and with all farm workers over the age of 14; information about other household members, including those in the United States, was also obtained.

The survey in California was carried out by Runsten et al. (1993) under the auspices of the U.S. Congress’ Commission on Agricultural Workers, set up as part of the Immigration Reform and Control Act of 1986. It is comprised of interviews with 50 tomato workers who worked on randomly selected tomato farms around Stockton, Fresno, and San Diego, the main tomato growing regions of California. Interviews collected detailed migration and work histories on these workers, as well as information on their working and living conditions in 1991 and 1992, when the survey was conducted.

The paper also uses information from qualitative interviews with growers in northwest Mexico and California. Aggregate trends in production, wages, and other key variables are obtained from data collected by other researchers and official government sources in both countries.

### Theoretical Perspectives on U.S.-Mexico Economic Integration

The analysis of economic integration between asymmetric economies that have strong links in product, capital, and labor markets is relatively uncharted territory. Empirical research by economists on U.S.-Mexican integration received little attention until after NAFTA was proposed, even though integration had already accelerated with unilateral Mexican trade liberalization in the 1980s. The many national and binational computable general equilibrium (CGEs) models of U.S-Mexican integration, constructed in the two years preceding NAFTA’s approval, produced a variety of predictions on wage and employment trends in the two economies (Hufbauer and Schott 1992; Leamer 1991; Hinojosa Ojeda and Robinson 1991, 1992). The studies in general modeled the effects of changes in U.S-Mexico trade; a few also
incorporated changes in labor flows, and even fewer analyzed changes in capital flows (Pastor 1994). Although they have captured many basic differences in the structures of the U.S. and Mexican economies, the CGE models are still very aggregated, usually assume full employment, and have limited ability to incorporate externalities and institutions (see Hinojosa Ojeda and Robinson (1992) and Pastor (1994) for useful reviews of models).

The majority of the NAFTA studies using CGE models predicted long-term increases in wages on both sides of the border, although the effect was much smaller on the U.S. side, owing to the relatively minor impact that the small Mexican economy can have on the U.S. economy. Some of the studies predicted declines in the wages of low-skilled and unskilled workers in the United States, underscoring the fact that competition with Mexican workers will be limited to U.S. sectors that employ unskilled and low-skilled workers (Leamer 1991; Gunderson and Reynolds 1993). Interestingly, one study concludes that the negative wage effect of NAFTA on U.S. low-skilled workers will be a result not of competition with Mexican imported goods but rather of increased migration and the consequent flooding of low-skilled labor markets in the United States (Hinojosa Ojeda and Robinson 1992).

The starting point for economists researching the impact of economic integration on workers on both sides of the border is of course trade theory. Trade theory posits that free trade can lead to factor-price equalization (i.e., cross-border convergence of returns to labor and capital) under the stringent assumptions that the traded goods are produced in both countries and similar production technologies are available (Gunderson and Reynolds 1993). As Gunderson and Reynolds (1993) have pointed out, factor-price equalization does not mean that wages in each sector will equalize, but rather that labor costs per unit of output, sometimes called “efficiency units of labor,” will equalize. Only workers with equal levels of productivity can be expected to receive equal wages as a long-term consequence of free trade.

Thus productivity differences between trading partners are central to any discussion of the impact of economic integration on wages and competitiveness in each trading partner. Conventional economic analysis suggests that, compared to firms in Mexico, firms in the United States in general should choose technologies with a relatively high capital/labor mix, reflecting the relative abundance of capital and scarcity of labor in the United States compared with Mexico. The resulting production processes should result in higher labor productivity in the United States, because of the higher capital content of the technology. Corn production in the two countries provides a dramatic illustration of this tendency, with U.S. farmers using tractors and other specialized machinery to cultivate large tracts of land and produce many times the output per person that Mexican peasants can produce cultivating small parcels with a pair of oxen and lots of hand labor.

Commonly, however, similar technologies are used in Mexico and the United States, especially in sectors in which transnational firms are the dominant investors. Shaiken’s (1990) study of electronics, autos, and computers confirms this trend. Shaiken noted that the newer Mexican automotive plants have the same productivity (output per person-hour) as their U.S. counterparts because they used state-of-the-art technology and invested heavily in managerial improvements and worker training. In the auto engine plant he studied, labor costs per auto engine were substantially lower in Mexico because wages and benefits were only a fraction of U.S. rates, and labor productivity was the same.

Fruit and vegetable producers in California and northwest Mexico also use similar technologies. These technologies require high capital investments but are also labor-intensive. However, as I will
document, labor productivity in northwest Mexico is substantially lower than in California. This is due not to lower capital investment in Mexico, but rather to differences in labor-management strategies that extract lower worker effort. As a consequence, differences in labor costs between northwest Mexico and California are not as great as the wage gap, and Mexico’s comparative advantage in horticulture production is lower than might otherwise be expected (Runsten and Wilcox-Young 1992).

The complexity of the determinants of productivity differences in the two countries in various sectors suggests that more research is needed to understand the process of economic integration, including the determinants of productivity growth in the two countries. While the aggregate studies such as CGE models assume that adjustments are costless and proceed in predictable ways, case studies give us insight on how national economic environments and specific regulatory regimes and institutions affect integration. In addition, case studies can highlight the interrelation between trade flows, capital flows, and labor flows, which is especially important in many labor-intensive economic sectors where Mexican labor is used on both sides of the border.

Production and Wage Trends in Horticulture, California and Baja California

Since the turn of the century, California has been the leading producer of fresh fruits and vegetables for consumption in the United States. California ships approximately 25 percent of the fresh tomatoes in the U.S. market, while Florida ships around 40 percent. In Mexico, the state of Sinaloa is the largest shipper to the U.S. market, accounting for about 25 percent of total U.S. consumption, while Baja ships about 6 percent (Cook 1991). Market shares have remained relatively stable for all regions since 1980, with the exception that exports from Baja grew significantly during the 1980s as production shifted south from San Diego (see Fig. 1). Both California and Baja ship tomatoes in the summer and fall, with California production ready for market from May through the end of December and Baja production from June to the beginning of December. Florida produces tomatoes from October through June and competes directly with Sinaloa during January, February, and March (Cook 1991). Total tomato consumption in the United States grew from about 110 billion kilograms to about 150 billion kilograms in the 1980s, allowing growth in production in both the United States and Mexico (Cook 1991).

Mexico’s agro-export horticulture production received a significant boost from the Mexican economic crisis and structural adjustment that began in the late 1970s. While both gross domestic product and total agricultural production were stagnant in the 1980s, the volume of Mexico’s horticultural export sector increased at an average annual growth rate of 3.2 percent (Cook 1991). Dramatic shifts in relative costs occurred during the 1980s, due to peso devaluations, Mexico’s lowering of import tariffs (which lowered the costs of

![Figure 1. Fresh tomato shipments in California and Baja California. Source: for California, USDA (1993); for Baja, Roberta Cook, pers. comm., 13 August 1996. Baja data not available for 1991.](image)
imported inputs for horticultural production in Mexico), and real wage declines. After a period of revaluation of the peso and slowly rising real wages, the late 1994 devaluation, which cut the peso’s value by more than half, once again lowered Mexican costs in dollar terms.

In comparison to these price shocks, NAFTA’s effect is quite small. Pre-NAFTA tariffs on fresh tomatoes were less than 10 percent of the value of the product and will be phased out over 15 years. Thus, each year, the tariff decrease is less than 1 percent, a small decrease in comparison to the price shocks resulting from the recent devaluation. This is true even though the effect of the devaluation is greatly dampened by the fact that most production costs for Mexican tomato exports, such as imported inputs, transportation, and other marketing costs, are dollarized.

Cost comparisons between Baja and two regions in California show that costs in Baja are close to California costs, and without the tariffs of about 10 percent Baja would have had a slight cost advantage (Runsten et al. 1993). Detailed postdevaluation cost figures are not available, but experts estimate that production costs in Baja have dropped about 50 cents, a 10 percent decrease from the 1991 estimates (Cook 1996).

Baja California’s trajectory as an export region has been affected by the forces just mentioned. Baja’s agro-export sector was given a major push in the early 1980s as San Diego grower-shippers were attracted to Baja by falling costs there and pushed from Southern California by increasing land and water costs. U.S. grower-shippers entered into joint ventures or other arrangements to finance and market tomatoes and other crops with about a dozen large local Mexican growers who were ready to expand production. Baja’s further expansion is limited, however, by limits on water availability (Cook 1991; Runsten et al. 1993).

Production technologies have been transplanted intact from Southern California to Baja. Patented seeds, plastic mulching, and planting in plastic tents are common practices in both areas, as is drip irrigation. The tasks carried out by field workers—which include transplanting, staking, pruning, and harvesting—are almost identical in both areas. Baja growers belong to the same U.S.-based trade organizations as their counterparts north of the border and call upon University of California extension agents when they have a pest problem (Cook 1991; Runsten et al. 1993).

Labor Market Transformations in Baja and California

California’s “factories in the field,” as Carey McWilliams (1939) called large farms, have relied on foreign-born or migrant workers for the last hundred years, and the history of ethnic succession of Chinese, Japanese, Filipino, Mexican, and other immigrant groups in California agriculture is well documented. Since World War II, when the Bracero Program was implemented, the great majority of California’s farm workers have been Mexican. Currently, over 90 percent of farm workers in California were born in Mexico. Among the tomato workers interviewed in the California survey, all were born in Mexico (Runsten et al. 1993).

Significant improvements in living standards for California farm workers have been achieved since the Bracero Program ended in 1965. These were the result of the rise of the United Farm Workers union movement and the passage of the California Agricultural Labor Relations Act and other legislation that extended to farm workers federal protections which they had previously been denied, such as unemployment insurance and wage and hour standards (Wells and West 1988). In addition, many social programs were created especially to meet the needs of farm workers, including Migrant Education, the rural health clinics, and the state-run family labor camps. These improvements
allowed many Mexican migrants to establish themselves and settle with their families in rural California (Palerm 1991).

By virtually every indicator, however, during the 1980s there was a sharp reversal in the improvements for farm workers described above. Currently, only a fraction of the work force is under union contract. Unemployment has increased as well, and fringe benefits have virtually disappeared (U.S. Congress. Commission on Agricultural Workers 1993). As shown in Figure 2, wages in California agriculture have declined almost 20 percent in real terms over the last ten years (USDA 1993).

Decreasing wages and worsening conditions in California have their roots in structural economic changes in the U.S. and Mexican economies, which have resulted in greater flows of trade, capital, and labor between the two countries. California's fresh fruit and vegetable sector has faced increasing domestic and international competition, including that from Mexico. Economic crisis and liberalization in Mexico have had two effects: they have propelled unprecedented waves of new U.S.-bound Mexican migration, and they have attracted U.S. agricultural capital to Mexico. These twin outcomes of stronger economic links between rural Mexico and rural California have undermined the bargaining position of workers vis-à-vis employers in the U.S. farm labor market, the first by creating labor surplus, the second by creating pressures to reduce costs.

The entry of new Mexican migrants into the farm labor market was ironically fostered by recent U.S. immigration policy, embodied in the Special Agricultural Workers (SAW) provision of the 1986 Immigration Reform and Control Act. This program allowed workers who had worked 90 days in agriculture in 1985 to obtain legal residency and work documents. In essence, the SAW program functioned to recruit workers, because both employers and immigrant advocates helped thousands of workers obtain documents. In California alone, 700,000 people applied for amnesty under the SAW provision, about 50 percent more than the entire estimated farm work force in the state (Martin 1989). Since then, ongoing entry of new undocumented migrants continues to put significant downward pressure on wages (U.S. Congress. Commission on Agricultural Workers 1993).

Baja California growers have also had to use an imported labor force, which they have recruited from southern Mexico. More than 60 percent of the field workers in Baja's San Quintin Valley are Mixtec Indians from the state of Oaxaca (Garduño, Garcia, and Moran 1989; PRONSAJ 1991). The remainder of the work force is composed of workers from other ethnic minorities in Oaxaca and neighboring states, the children of Oaxacan migrants who were born in Baja or Sinaloa, and a limited number of workers from other states in Mexico.

Real wages (which reflect the purchasing power of farm worker wages) fell in Baja, as they did in the rest of Mexico during most of the 1980s; they stabilized in the early 1990s and have fallen again since the

1 See Zabin et al. (1993), Runsten (1991), and Martin (1989) for analyses of the decline of work conditions in California agriculture.
devaluation in 1994 (see Fig. 3). Baja wages in dollar terms (which reflect employers' costs) have taken a different trajectory. The devaluations of the late 1970s and early 1980s first dramatically lowered the dollar value of Baja wages. From 1989 until late 1994, however, the overvaluation of the peso resulted in a slow increase in the dollar value of Baja wages (see Fig. 4). Since the peso devaluation in November of 1994, Baja wages in dollar terms have fallen significantly, and hourly wages for farm workers there were about 60 cents an hour in mid-1995.

In sum, the 1980s was a period of significant expansion of the links in labor markets, product markets, and capital markets between Baja and California. Production and employment have increased in both regions. Real wages in the United States have fallen slowly but steadily, while in Baja they experienced a dramatic drop in the early 1980s then more or less stabilized and will probably drop once again as wages lag behind renewed high rates of inflation.

Differing Styles of Labor Management

This section presents a detailed examination of the two styles of labor management that employers in Baja and California have developed in response to the labor market conditions facing them. Two major practices are key. The first is the way in which employers attract and retain their workforce. The second is the way in which they supervise their workers and monitor the quality and quantity of the work performed.

Labor Supply and Recruitment

The timely availability of workers is essential to horticultural production, because the product is perishable and labor requirements fluctuate throughout the year. In Fresno County (which employs more agricultural workers than any other county in California), for example, labor requirements vary from about 22,700 workers in February to 79,800 in August (California Employment Development Department 1989).

It is ironic that California growers do not recruit workers, even though their workforce is almost all foreign-born, while growers in northwest Mexico, employing their own compatriots, must do so. California growers now have the advantage of well-developed migrant social networks, many of which are a direct consequence of 20 years of recruitment under the Bracero Program. As many scholars have noted,
migrant social networks, based on migrants' common ties to a particular sending village, help new migrants make contact with employers and find jobs (Massey, Alarcon, and Durand 1987; Mines 1981). These networks create efficient and virtually costless recruitment mechanisms for growers and provide a continuous flow of workers from rural Mexico to California.

In contrast, Mexican horticulture producers have a much shorter history of demand for labor than their California counterparts, and as a consequence migrant social networks that would bring workers to their farms are less well developed. Yet the same process that occurred earlier in California is now unfolding in Baja. Recruitment by Baja growers has started a migrant flow which over time will be maintained by the development of village migrant social networks.

The ongoing Mexican migration to the United States has resulted in a growing surplus of labor in California at current wage levels, with workers queuing for jobs, experiencing high degrees of seasonal unemployment, and working few hours each day or each week. Martin (1992) estimates that there are four to five workers available and willing to work for every farm job. Results from research requested by the Commission on Agricultural Workers, which was created by the 1986 Immigration Reform and Control Act, found evidence of labor surplus (at prevailing wages) in all ten case studies conducted of perishable crops. The U.S. Department of Labor, which was mandated to measure the net rate of exit from farm work by workers, conducted a national survey and found that more workers entered farm work than exited it during the 1987–89 period.²

California growers facing this situation are able to transfer the costs of recruitment to workers. The prevailing pattern in California farm work is that employers, whether farm labor contractors or growers, leave the recruitment of workers in the hands of their crew bosses, known as mayordomos. Mayordomos in turn give jobs to workers from their own or neighboring villages in Mexico (Massey, Alarcon, and Durand 1987; Zabin et al. 1993; Kearney 1986). Often, the ties between mayordomo and worker are characterized by patron-client relationships, in which workers gain access to jobs only by also paying mayordomos for transport to the fields, or even for housing (Zabin et al. 1993; Kearney 1986).

In contrast, growers in northwest Mexico spend considerable resources recruiting workers. In Sinaloa, 40 to 60 percent of the 170,000 workers are transported by employers, who send labor recruiters and buses to the highland towns of Oaxaca and Guerrero (Thompson and Martin 1989). In Baja, this figure was only about 18 percent, a decline from the early 1980s, when, because there was no local work force in this desert region, Baja's large growers recruited almost all of their workers. Since then, not only have more workers arrived on their own looking for work, but the region has also become a settlement area for migrants from Oaxaca and other southern Mexican states.

Horticulture producers in northwest Mexico recruit labor mainly from regions in the south of Mexico, specifically the states of Oaxaca and Guerrero. These areas are populated by very poor indigenous peoples who have few income-earning opportunities in their homelands. Interestingly, employers do not recruit from regions where there are workers with experience working in horticulture crops in the United States, such as Michoacan or Jalisco. One Baja grower decided not to recruit workers from his own home state of Michoacan. According to him these workers are not available for farm work in northwest Mexico because U.S. migration is a viable

² Since the purpose of the study was to provide advance warnings of labor shortages, the Department of Labor was not required to publish the net entry of workers into farm work and never released those calculations to the public.
alternative for them.\textsuperscript{3} Michoacanos have long traditions of working in the United States, and the social networks and contacts they have developed connect new migrants with jobs (Zabin et al. 1993; Cornelius 1992).

Although active recruitment is not as necessary as it was when export agriculture first expanded in Baja, growers still respond to spot labor shortages by spending substantial sums to recruit and transport workers from regions with large labor reserves. Rarely have growers raised wages to retain their work force or sought a work force that is closer than Oaxaca. The 1990 season seems to be the exception: when tomato prices skyrocketed that year, growers did bid up wages in an effort to attract and retain workers. But that wage war served only to teach growers that recruitment is cheaper than bidding up wages. One grower commented, “If you raise wages 10,000 pesos\textsuperscript{4} per day and you are paying 2,000 people, in two weeks that’s already a lot of money. You could bring up a lot of people from Oaxaca for that kind of money. Plus, it’s hard to lower the wage back down when the price of tomatoes goes down. For us, it’s worth it to bring up a lot of people and fill up the valley with workers, even if a lot of them don’t end up staying with us.”\textsuperscript{5}

In addition, farm workers in California have great difficulty in obtaining full-time and steady work. Even during the peak tomato season, workers in California have not been able to work full time because of the tremendous surplus of workers. Growers fill the fields with workers, granting each a specific number of rows, and workers often finish their rows within a few hours (Runsten et al. 1993). In contrast, during the growing season most workers in Baja work 40 to 48 hours a week, although during slack periods women may be given only three or four days of work per week.

In California, then, workers pay to obtain employment by incurring the cost of migration and job search. In Baja, on the other hand, employers incur costs to assure a supply of workers. In addition, workers in California experience the costs of part-time work and short-term unemployment, while workers in Baja have much more stable and full-time jobs.

Local Transport to the Fields

In California, transporting workers from their residences to the fields has become an important part of the farm labor contracting system. In the San Joaquin Valley, crew supervisors (\textit{mayordomos}) often also transport workers to the fields from labor camps or rentals in rural towns. Known as \textit{raiteros}, because they give workers a “ride” to the fields, these \textit{mayordomos} charge workers three to six dollars per day for transportation. In many cases, paying for transport is a condition of employment; one must ride with the \textit{raitero} if one wishes to work.

In Baja, all local transportation is provided by growers. Large school buses transport workers from labor camps to the fields and back again. Growers also send buses to the various farm workers’ settlements to pick up their workers who live there and transport them free of charge to the fields.

Housing

Housing is an important aspect of the farm labor market because of the seasonal

\textsuperscript{3} As this grower explained, the people from Michoacan are “gente de exportacion.” The term “de exportacion” refers to an export-quality product, such as “tomate de exportacion.” His comments reflect the view that the mostly mestizo (of mixed European and indigenous ancestry) migrants of Michoacan are of higher status than the mostly indigenous Oaxacans.

\textsuperscript{4} Equivalent to about U.S.$3.00 before the devaluation of December 1994.

\textsuperscript{5} This grower actually rented a commercial plane in 1990 and brought 100 workers from Oaxaca when tomato prices were especially high, but only 20 workers finished the season with him.
nature of farm work. Who pays for housing and how much it costs obviously affects workers’ net incomes and growers’ labor costs. As in the case of other expenses associated with farm work, the costs are distributed differently in the two regions. In addition, the way in which housing is provided is important in determining migration patterns, specifically the migration of family versus unaccompanied male workers.

During the Bracero era, growers in the United States were legally required to provide seasonal housing for their workers. Since then California growers have been able to transfer the costs of housing to workers and occasionally to the government. None of the tomato workers interviewed in California were provided housing by their employers. In the central San Joaquin Valley, settled immigrants or Mexican-Americans in rural towns near the fields rent out beds or space on the floor in a garage or extra room to seasonal workers by the week. In San Diego, some tomato workers live outside in “spider holes,” homemade huts carved into the hillsides that are built with discarded plastic and wood.6

In the Stockton area, tomato workers have been able to take advantage of housing in two labor camps owned by the California state government. These provide 192 units of seasonal family housing and house approximately 1,000 people, about half the fresh tomato workforce in the Stockton area (Runsten et al. 1993).7 The state-run labor camps were built in the early 1970s and are one of the few remaining housing programs that resulted from farm worker advocacy of that period. The camps are distributed throughout California and provide seasonal family housing for a small part of the farm labor force.

In northwest Mexico, growers still pay most of the costs of housing for their workforce. In Sinaloa, growers provide virtually all the housing for their seasonal work force. The housing situation in Baja has evolved over the 1980s from one dominated by grower labor camps to self-provision of housing in neighboring colonias (squatter settlements). Farmers in Baja have encouraged farm workers to settle in subdivisions of house lots that workers obtained through squatter invasions. When workers, led by the Central Independiente de Obreros Agrícolas y Campesinos (CIOAC), demanded housing as a part of their labor struggles in the 1980s,8 growers were against the squatter settlements. Over time, they realized that settlement could help anchor their work force, and since then they have supported the legalization of the settlements and state provision of urban services. In 1991, one of the largest growers donated land encompassing his labor camp to the state government, which in turn developed it into urban lots for distribution to farm workers. The grower said, “Labor camps just cost us money and give us headaches, so if our farm workers want their own house lots, that’s better for us.”

Fourteen colonias have formed in the San Quintín Valley since 1980, inhabited by more than 10,000 farm workers and their families in 1992 (PRONSAJ 1991; Garduño, Garcia, and Moran 1989), in

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6 In San Diego County alone, from 5,000 to 14,000 farm workers live in makeshift huts, cardboard shacks, and homemade shelters in illegal squatter camps made up mostly of men. This is not a step toward settlement but rather a response to lack of affordable housing in the area.

7 A large proportion of the other half of the labor force are former camp residents who have settled in the area.

8 The CIOAC is an independent union that emerged in the 1980s in Baja and carried out major strikes for several years. It won several wage increases, but these were soon outpaced by inflation and had minimal lasting effect on the farm labor market (grower and worker interviews).
addition to the neighborhoods of farm workers that have grown in the small towns that run the length of the San Quintin Valley. For the workers, access to house lots is a major step up in living standards and autonomy. Living conditions in the camps are poor, with families crowded into 9-meter-square rooms in long tin or cement sheds. Sanitation conditions are poor as well, and severe health risks have been documented by government agencies (Garduño, García, and Moran 1989). In the settlements, most workers have been able to build adobe or cement-block houses within several years, although a minority still live in homemade cardboard shacks. Lot sizes are large, allowing families to grow gardens to supplement their livelihoods.

In sum, housing in northwest Mexico is either provided by growers in labor camps at no charge to workers or obtained as a consequence of squatter invasions at relatively little cost to workers. In California, a range of housing situations exist, depending on the region, but housing commonly costs the workers more, and the growers less, than in northwest Mexico.

The expenses of housing and transport incurred by migrants to California are significantly greater than those paid by workers in Baja. In addition, workers in California must supply their own tools and equipment, while in Baja these are provided by the employer. The extent to which the added expenses of working in California lower workers' net income is shown in Table 1. In contrast, Baja workers do not face such deductions because growers incur these costs. Although workers in California also earn much more per hour than Baja workers they work fewer hours per week, a difference that results in a weekly earnings gap that is smaller than the wage gap (Table 1).

**Supervision and Worker Effort**

Strategies to induce work from hired workers always rely on a mixture of direct supervision and incentives or sanctions. The mix used by growers and the systems of labor control that have evolved are quite different in the two regions. In California, employers in general rely on supervisory schemes that reward productivity, often using farm labor contractors (FLCs) responsible for supervising (as well as recruiting and transporting) workers. In Baja, employers do not use FLCs, they pay their crew supervisors (mayordomos) directly, and they pay workers a daily wage that does not reward harder work.

In California, a tiered system of supervision exists in which the income of a supervisor depends on the productivity of the workers below him or her. FLCs are usually paid a specific price per volume produced, so the more work they can get out of their workers, the greater their profits. The FLCs in turn pay the mayordomos an hourly wage, often in the range of five to seven dollars an hour. FLCs count on the crew supervisors to get their workers to work on time, and supervisors increase their income by charging workers for the daily ride to work.

In Baja, in contrast, supervisors' incomes are not dependent on their workers' production. They are paid a slightly higher daily wage than field-harvest workers but are not given direct incentives to increase the productivity of their workers. Moreover, the labor struggles of the 1980s forced growers and crew supervisors to stop using verbal harassment to induce harder work. As one worker commented, "Now they don't yell at us or push us like they used to [before the emergence of the

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9 A high and growing percentage of California growers employ farm labor contractors who oversee all field labor needs. Between 1984 and 1990, the number of workers employed by farm labor contractors increased 42%, and the wages paid by them increased by 86% (U.S. Congress. Commission on Agricultural Workers 1993, 836).
Table 1

Average Weekly Costs and Earnings for Tomato Workers in Baja and California
(in U.S. $s)

<table>
<thead>
<tr>
<th>Location</th>
<th>Hours Worked Weekly</th>
<th>Weekly Local Transport Costs</th>
<th>Weekly Housing Costs</th>
<th>Equipment Charges</th>
<th>Net Weekly Income</th>
<th>Costs as Percentage of Income</th>
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<tbody>
<tr>
<td>Stockton, Calif.</td>
<td>$8.20 27</td>
<td>$168.50</td>
<td>$18.24</td>
<td>$9.28</td>
<td>$136.00</td>
<td>19%</td>
</tr>
<tr>
<td>Fresno, Calif.</td>
<td>$8.11 37</td>
<td>$209.22</td>
<td>$27.42</td>
<td>$25.00</td>
<td>$153.30</td>
<td>27%</td>
</tr>
<tr>
<td>Baja</td>
<td>$0.88 42</td>
<td>$44.24</td>
<td>0</td>
<td>$0.12</td>
<td>$44.12</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Source: Runsten et al. (1993); author’s survey.

CIOAC].” In addition, growers in Baja allow and plan for absenteeism, whereas in California employers do not tolerate it. In sum, worker discipline is much greater in California than in Baja.

Payment Systems

Payment systems also differ between California and Baja. In California, 72 percent of the tomato workers surveyed were paid piece rates and the rest were paid an hourly wage. In Baja 97 percent were paid a daily wage. In Baja, workers are required to produce a specific volume of output. A minimum norm is established for the group as a whole, including the older workers, women (who sometimes carry their infants with them), and children. All workers are paid the same wage. This system slows the work pace substantially because there are no rewards for those workers who are able to produce more than the average. Growers pay piece rates only under unusual circumstances, for short time periods when tomato prices rise and growers want to get the crop picked as quickly as possible.

The differences in labor productivity that result from different supervisory and payment systems in Baja and California are clearly illustrated in Table 2. Runsten et al. (1993) measured the volume of tomatoes harvested per worker per hour in Baja and California and found that output is three times as great in California as it is in Baja. This enormous difference between the labor productivity of workers carrying out harvesting tasks in Baja and California merits substantial discussion. It is clearly not the case that workers in California harvest more quickly because there is more mechanization. In both regions, workers perform the same tasks using the same equipment: they pick tomatoes in 19 liter (five gallon) buckets while walking along the tomato rows, sorting for color and size, and removing stems and mud when needed. Workers and growers on both sides of the border acknowledge that the pace of work is much faster in California. Some older workers complained about the pace of work in the United States. According to one 65-year-old Mixtec who said he went to Oregon in 1985 but did not like it and moved back, “There, if you move, you can make money. If you don’t move you don’t make anything. Since I’m old, and I can’t move fast, I like it here in San Quintin [Baja].” Some young men who had returned to Baja from the United States expressed frustration at the pace of work in

10 “Ya no nos gritan ni nos acarrillan como antes” (farm worker interview, 1992).

11 Interestingly, both growers and workers estimate that average labor productivity per hour doubles when piece rates are paid.
Table 2
Tomato Harvesting Costs and Wages

<table>
<thead>
<tr>
<th></th>
<th>(a) Harvesting Cost per Kilogram of Tomato</th>
<th>(b) Wage per Hour (Hourly Equivalent when Paid by Piece)</th>
<th>c = (a)/(b) Kilograms Harvested per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baja</td>
<td>$0.0026</td>
<td>$0.88</td>
<td>69</td>
</tr>
<tr>
<td>Stockton, Calif.</td>
<td>$0.008</td>
<td>$8.20</td>
<td>219</td>
</tr>
<tr>
<td>Fresno, Calif.</td>
<td>$0.007</td>
<td>$8.11</td>
<td>246</td>
</tr>
</tbody>
</table>

Source: Runsten et al. (1993); author’s survey.

Baja. They were required to work their eight hours and were given no reward for working faster.12

Why do Mexican workers work harder in the United States than they do in Mexico? One mayordomo interviewed in Baja who worked in both regions said, “The same workers work harder, cleaner, and go to work everyday when they cross the border. In Baja, if they miss a day, they'll still eat because somebody in their family is out working, an uncle, a sister, somebody. But in the United States they might be on their own, so they have to buy their food, pay rent, and pay for every little thing.” Another factor explaining high worker discipline in California may be legal status. Twenty percent of the tomato workers interviewed in California were undocumented. The risk of losing their jobs is an incentive to work hard.

In addition, migration of Mixtecs to California is a selective process. Not only do the same workers change behavior in response to different work environments, but the set of migrants that work in northwest Mexico differs somewhat from those who work in California, even though both are Mexican. Mixtec workers have developed particular patterns of migration to take advantage of employment opportunities in both countries: they migrate in family groups to Baja and Sinaloa, and then many of the younger unaccompanied males migrate to the United States. Information from the Baja survey shows that 86 percent of returned and current migrants from Baja to California helped support their immediate families who reside in Baja (Zabin and Hughes 1995).

Worker Retention

As a consequence of different wage and reward structures in Baja and California, growers in Baja have difficulty retaining their young male work force once the workers have arrived in the San Quintin Valley. Growers who recruit workers to the San Quintin Valley commented that many of their workers do not stay with them but migrate to the United States. One grower estimates that of six hundred workers that he transported from Oaxaca to Baja in 1990, only one or two hundred stayed with him that season. According to the grower, “We’re a school for el Norte. When workers come here from Oaxaca, a lot of them don’t know how to speak Spanish, they don’t know how to drive a car, and they really don’t know how to live in a technified culture. After a couple years with us, they

12 Recently, some growers in Baja have begun to pay workers by the task, assigning a certain quantity of work per day after which a worker could go home. This allows faster workers to have shorter work days, but still does not put the supervisor in the position of hurrying the slower workers.
can save and buy an old car, which they could never do in Oaxaca. In Oaxaca, where are they going to learn, on top of a donkey? In two or three years after they get used to life outside their pueblo, they go north and work in the United States, especially the young men."

Growers in Baja have accepted family-based migration and settlement as a way to anchor their labor force. When export production in Baja began to expand in the late 1970s, growers started recruiting a male work force. As labor shortages developed, however (when many of these workers continued north into California), growers encouraged workers to bring their entire families as a way to secure their work force for longer periods. Women have sought employment as well, and men who are hired often ask growers to hire their wives and children.

In contrast, growers in California are not generally concerned about retention of workers, and thus can avoid the costs associated with anchoring their work force. The labor surplus there means that workers are always available to take the place of those who leave, many of whom have experience picking tomatoes in Mexico. In fact, there are strong tendencies among growers to constantly seek a lower-cost work force by inducing high labor turnover. During the 1980s, California growers commonly turned to farm labor contractors as a means to switch away from a unionized work force (Martin 1989). More recently, there is evidence that growers who gain access to a network of Mixtec migrants often substitute them for their previous mestizo work force (Zabin et al. 1993).

As a consequence, growers in California have access to a continuous flow of males of prime working age, many of whom migrate without their families. A work force of lone males offers tremendous advantage to employers because the workers not only are extremely productive, they are also generally willing to work long and flexible hours and to accept poor living conditions close to the fields.

In sum, employers in California and in Baja have chosen very different labor management strategies and wage regimes. The growers in California operate a high-unemployment, (relatively) high-wage regime, characterized by tight disciplining of the labor force, extraction of high worker effort, and a shifting of other costs, such as transportation, housing, and job search, to the workers. Growers have developed these strategies as a consequence of an ample supply of workers who queue for jobs. In addition, because there is queuing for jobs in California, employers have the option of choosing their preferred work force. In general, this appears to be composed of young unaccompanied men who are very productive and have great flexibility in terms of travel and work hours.

In Baja, on the other hand, procuring and retaining labor is a chronic problem. Because workers can easily find other work in the area, it is more difficult for employers to use the threat of dismissal to discipline and push the labor force. Growers in Baja manage labor with a low-wage, high-employment regime in which housing, transport, and job search costs are borne by growers, and in which labor discipline is less strict. Growers employ a higher proportion of women and children and have encouraged a family migration pattern as a way to anchor their work force in Baja.

**Why Baja Growers Do Not Change Their Labor Management Practices**

An obvious question that emerges is, why do Baja growers not change their labor management system in order to extract higher levels of productivity from their employees? One would expect that Mexican workers would be willing to work as hard in Mexico as in the United States, if they were rewarded for doing so. That is, from the workers' perspective, if their wages in Baja were at least equal to the California wage minus the costs of migration and the difference in the cost of living between California and Baja, they would
Wage, Income, and Effort Gaps between Fresno and Baja

<table>
<thead>
<tr>
<th>Worker Effort</th>
<th>Hourly Wage Equivalent</th>
<th>Weekly Income</th>
<th>Net Weekly Income</th>
<th>Worker Effort (Kilograms per Hour Harvested)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno, Calif.</td>
<td>$8.11</td>
<td>$209.22</td>
<td>$153.30</td>
<td>246</td>
</tr>
<tr>
<td>Baja</td>
<td>$0.88</td>
<td>$44.24</td>
<td>$44.12</td>
<td>69</td>
</tr>
<tr>
<td>Ratio Fresno/Baja</td>
<td>9.2</td>
<td>4.7</td>
<td>3.5</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: Runsten et al. (1993); author’s survey.

How high would employers have to raise the wage to equalize the net returns to workers? A rough estimate of net returns to workers in California and Baja provides an answer. Although we cannot hope to calculate this precisely, we can make the following estimates for workers’ net incomes for migrating one season, as shown in Table 3. The data show that the average weekly income for tomato workers in California is about $145, net of housing, daily transport, and tools. Tomato workers on average work about 26 weeks per season, so their estimated average seasonal income for work in California is $3,640. Subtracting an average migration cost of $290, which was estimated from interviews with 30 workers in Baja who had previously migrated to the United States, yields an average seasonal income of $3,240. Average net weekly income for Baja workers for our sample was $44.12, producing a 26 week net income of $1,238. Baja growers would have to pay their workers 3240/1238 = 2.6 times the current rate in order to equal their net income for migrating to California. But it should be worth it to them, because in principle they would get triple the productivity out of the workers. If the cost-of-living differences and the risks of unemployment or deportation are also included, this ratio would be even smaller (since the numerator would be smaller), thus strengthening the economic incentive for Baja growers to increase wages in return for increased worker effort.

In principle, if Baja growers were able to imitate the labor management practices used by their California counterparts, their profits would increase. But growers seem to believe that piece-rate schemes will not work in Mexico in the same way they do in California. The selective migration process described above indicates that workers who work harder in response to incentive schemes are those who are more likely to migrate to the United States. It may be that workers who stay in Baja—more children, women, and older men—do not respond to piece-rate pay schemes in the same way as the ones who migrate to the United States. Moreover, growers in Baja do not believe that they can drive their work force, given the large number of children, women, and older people. Growers spoke of their fear of political repercussions and labor strife if...
they were to demand greater productivity through piece-rate pay.15

Other explanations given for the personnel management strategies of Baja growers seem to be quite weak. For example, some researchers have suggested that Baja growers are poor personnel managers and simply do not realize that there is an economic incentive to change payment schemes and raise wages for more productive workers. But discussions with growers reveal sophisticated management techniques in other aspects of their productive activities and a constant search for innovations that would lead to lower costs. This makes it doubtful that they are simply making bad individual business decisions.

Another explanation given is that employer collusion in the region (not just in horticulture production) may result in wage suppression, even though switching pay schemes and raising wages may be in the interest of individual employers. Shaiken (1990) noted that automobile plant managers in northern Mexico, facing high rates of turnover and high costs of training new workers, want to raise wages but are impeded from doing so by other employers in the area.

I hypothesize that Baja growers are doing the best they can in a constrained situation. In order to secure a labor force, they have developed a labor management style oriented toward family labor. Successfully anchoring this work force translates into lower productivity, not because women are inherently less productive, but because of their dual responsibilities as workers and as caregivers of children, which includes carrying some infants to the fields and watching over working children. Growers accept as inevitable the lure of the north for experienced and fast workers and fear that a radical switch in labor management styles would be risky, with no guarantee of higher returns.

15 Roberta Cook, pers. comm., 13 August 1996.

Conclusion

NAFTA has formalized a process of binational economic restructuring that was already well under way in many sectors of the U.S. and Mexican economies. Economic integration between the two countries is an uneven process that varies across geographic regions and economic sectors. Binational industry case studies offer an opportunity to study the process of economic integration in specific settings and to understand the variety of social, institutional, and economic forces that determine the overall trajectory of development in the linked North American region. In contrast to aggregate economic modeling based on trade theory, which assumes costless adjustment to changes in economic policy, case studies can capture the complex and socially embedded process of adjustment by real economic agents.

Focusing on horticulture reveals how integration works in sectors characterized not only by trade flows, but also by investment ties and labor links—that is, the use of low-skilled Mexican labor on both sides of the border. Through this case study of tomato production in Baja and California, I have illustrated a variety of ways in which institutional and social processes and cross-border links have shaped the industry’s development on both sides of the border. The case of tomatoes confirms Shaiken’s (1990) assertion that technological choice is not determined strictly by the relative scarcity of capital and labor, as predicted in simple trade theory. Even in this labor-intensive sector, very similar technologies are used in California and Baja, because investment has been led by U.S. growers and because low-wage Mexican workers are available to both Mexican and U.S. employers.

Even with similar technologies and work forces, however, labor relations and the organization of work have developed differently on each side of the border. U.S. growers are able to extract higher productivity from workers by paying piece rates
and by externalizing the costs of transportation, housing, and job recruitment, while Baja growers pay lower wages but extract lower productivity from their workers and have to pay out significant expenses for worker housing, transport, and recruitment. These differences are the result of a variety of factors that are not strictly economic but have much to do with the role of each country's government in mediating capital-labor relations, different labor management styles, embedded migration patterns, the particular status of Mexican workers in the United States, and the changed expectations of Mexican workers when they work in the United States.

Thus, the institutional matrix in which production takes place has an enormous impact on labor costs, driving a wage gap that in 1992 was in the neighborhood of ten to one down to a labor cost per unit of output that was only approximately three to one. Since labor costs are an important determinant of the location of production, they link the very micro-level social processes—comprised of the organization of labor markets, migration practices, and labor relations—and macro-level trends in location and investment decisions, regional competitiveness, and employment growth or decline. In this case, Mexico is a relatively less attractive site for horticulture production than would be concluded from a simple cost analysis that ignored the complexities highlighted here.

This has important implications for the nature of the integration process between Mexico and the United States. In sectors that are highly interlinked in capital, product, and labor markets and that use unskilled labor, downward convergence of wages is likely to occur. The labor market interdependence between California and Baja seems to be exerting downward pressure on California wages without significantly raising wages on the Mexican side. Growers in Baja will continue to tap the reserves of impoverished labor in Mexico, especially from the southern states. Until reserves of impoverished rural labor are absorbed by expanding employment opportunities, labor market interdependence is likely to put downward pressure on wages in California without bringing wages in Mexico up.

Several interesting hypotheses emerge from this study that may apply to the process of economic integration in other sectors. First, many authors have noted that the United States remains an attractive site for some production facilities only because firms have tapped into immigrant workforces that work for lower wages than U.S.-born workers. Whereas previous analyses have focused only on wages, this study shows the importance of also investigating whether there are other advantages to employing an immigrant workforce. These include the higher worker effort that employers can extract from immigrants and the training, transport, and recruitment costs that may be borne by Mexican employers instead of U.S. employers. Agriculture appears unique in that many farm workers work first in Mexico and then migrate to the United States to perform the same tasks they had performed in Mexico. But there is some anecdotal evidence that this also occurs in shoe production (Runsten 1988), furniture, and apparel.

Second, in the case described here there are constraints to improving productivity in Mexico because growers employ a low-wage, low-productivity labor management style and do not believe they will be rewarded with sufficiently greater worker effort to justify paying higher wages. Are employers in Mexico in other sectors stuck in a similar low-productivity trap? A similar phenomenon may be at work in the maquiladora sector, where low wages and high turnover characterize the labor process and may be an obstacle to incentives for investing in productivity improvements.

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Studies Associations Meetings, Los Angeles, September.


