

A survey of the evidence concludes that the NJTC increased employment in the subsample of firms that were aware of the program, generating about 400,000 permanent new jobs.<sup>8</sup> The total cost of the tax credit to the U.S. Treasury was roughly \$4.5 billion, so each new job cost taxpayers an average of \$11,250 dollars.

It turns out, however, that only 27 percent of small firms were even aware of the NJTC's existence and that only 6 percent of firms actually made use of the tax credits. Because of the limited participation of firms, it is possible that only a small fraction of the employment increase can be directly attributed to the NJTC. After all, firms that had plans to expand and hire more workers had the most incentive to learn about the program and to make use of the tax credits. In other words, employment would have risen among the firms that ended up being the beneficiaries of the NJTC even if the program had not been in effect.

The Targeted Jobs Tax Credit (TJTC), which began in 1978, offers subsidies (lasting 2 years) to firms that hire workers from specific demographic groups. These groups include ex-convicts, persons receiving general assistance, and Vietnam veterans. Originally, the TJTC provided a tax credit amounting to 50 percent of first-year and 25 percent of second-year wages (up to \$6,000) for employers who hired individuals in the targeted groups. Few employers seem to have been aware of the existence of this program, and the evidence does not suggest that this particular type of targeted tax credit has greatly increased the employment of targeted groups.<sup>9</sup> One possible explanation for the failure of targeted tax credits to increase employment is that employers may attach a stigma to targeted workers and will shy away from them. The impact of this type of discrimination on the firm's demand for labor is discussed at length in Chapter 10.

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## 5-4 POLICY APPLICATION: IMMIGRATION

In our second policy application, we consider how government policies that restrict or favor large-scale immigration shift the supply curve and alter labor market outcomes. Because of major policy changes, the United States witnessed a major resurgence in immigration since 1965. In the 1950s, for example, only about 250,000 immigrants entered the country annually. By the late 1990s, over 1 million legal and illegal immi-

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<sup>8</sup>Jeffrey Perloff and Michael Wachter, "The New Jobs Tax Credit—An Evaluation of the 1977–78 Wage Subsidy Program," *American Economic Review* 69 (May 1979): 173–179; John Bishop, "Employment in Construction and Distribution Industries: The Impact of the New Jobs Tax Credit," in Sherwin Rosen, editor, *Studies in Labor Markets*. Chicago: University of Chicago Press, 1981; and Mark R. Killingsworth, "Substitution and Output Effects on Labor Demand: Theory and Policy Applications," *Journal of Human Resources* 20 (Winter 1985): 142–152.

<sup>9</sup>David O'Neill, "Employment Tax Credit Programs: The Effects of Socioeconomic Targeting Provisions," *Journal of Human Resources* 17 (Summer 1982): 449–459; and John H. Bishop and Mark Montgomery, "Does the Targeted Jobs Tax Credit Create Jobs at Subsidized Firms?" *Industrial Relations* 32 (Fall 1993): 289–306. An interesting discussion of how tax policy affects human capital investments is given by James J. Heckman, Lance Lochner, and Christopher Taber, "Tax Policy and Human-Capital Formation," *American Economic Review* 88 (May 1998): 293–297.

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 Theory at Work

### The Clinton Health Care Program

As originally proposed in 1993, Bill Clinton's Health Care Reform proposal mandated that employers pay a large fraction of the health insurance premium of their workers. In particular, firms would have had to pay 80 percent of the costs of health insurance premiums for their workforce, with the total employer contributions being capped at 7.9 percent of the firm's payroll. Firms that employed fewer than 50 workers would have had their contributions capped at lower levels, sometimes as low as 3.5 percent of payroll.

If enacted, the Clinton proposal would have been a new payroll tax on employers who did not currently provide health insurance to their workers or who provided "substandard" programs. As such, the program would certainly have had disemployment effects. In addition, because part of the tax is shifted to workers, wages would have fallen.

The impact of payroll taxes on both employment and wages depends on the elasticities of both labor supply and labor demand. If the labor supply curve has an elasticity of 0.2, and the labor demand curve has an elasticity of  $-1$ , it has been estimated that the Clinton plan would have reduced employment by 517,000 jobs and that annual earnings of the workers who are currently uninsured would have fallen by at least \$1,000.

The Clinton Health Care Reform proposal would likely have had many other impacts on the labor market. For example, small firms would clearly hesitate before expanding their workforce to more than 50 workers, while firms currently employing just over 50 workers would likely contract (or subdivide) as they search for ways of minimizing their financial burden.

Source: Alan B. Krueger, "Observations on Employment-Based Government Mandates, with Particular Reference to Health Insurance," Working Paper No. 323, Industrial Relations Section, Princeton University, January 1994.

grants were entering the country annually. These sizable supply shifts helped reignite the debate over immigration policy in the United States. Perhaps the key issue in this debate concerns the impact of immigration on the labor market opportunities of native-born workers.

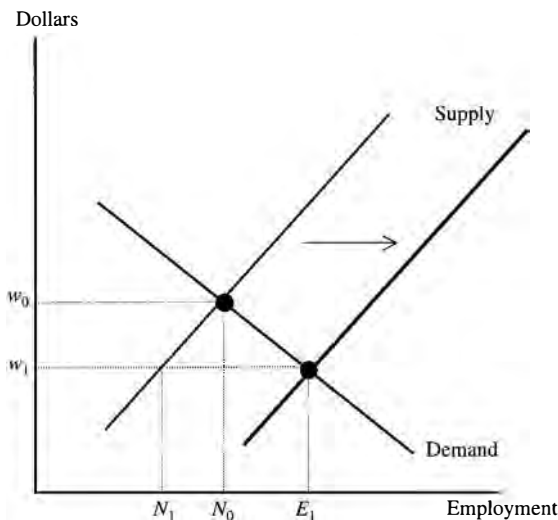
The simplest model of immigration assumes that immigrants and natives are perfect substitutes in production. In other words, immigrants and natives have the same types of skills and are competing for the same types of jobs. The impact of immigration on this labor market is illustrated in Figure 5-8. As immigrants enter the labor market, the supply curve shifts out, increasing total employment from  $N_0$  to  $E_1$  and reducing wages (from  $w_0$  to  $w_1$ ). Note that fewer native-born workers are willing to work at this lower wage, so that the employment of native workers actually falls, from  $N_0$  to  $N_1$ . In effect, immigrants "take jobs away" from natives by reducing the native wage and convincing some native workers that it is no longer worthwhile to work.

The impact of immigration when native workers and immigrants are perfect substitutes, therefore, is unambiguous. As long as the demand curve is downward sloping, an increase in immigration will move the economy down the demand curve, reducing the wage and employment of native-born workers.

Figure 5-8

### The Impact of Immigration When Immigrants and Natives Are Perfect Substitutes

Because immigrants and natives are perfect substitutes, the two groups are competing in the same labor market. Immigration shifts out the supply curve. As a result, the wage falls from  $w_0$  to  $w_1$ , and total employment increases from  $N_0$  to  $E_1$ . Note that at the lower wage, there is a decline in the number of natives who work, from  $N_0$  to  $N_1$ .



Of course, the assumption that native workers and immigrants are perfect substitutes is questionable. It may be that immigrant and native workers are not competing for the same types of jobs. For instance, immigrants may be particularly adept at some types of labor-intensive agricultural production. This frees up the more skilled native workforce to perform tasks that make better use of their human capital. The presence of immigrants increases native productivity because natives can now specialize in tasks that are better suited for their skills. Immigrants and natives thus *complement* each other in the labor market.

If the two groups were complements in production, an increase in the number of immigrants raises the marginal product of natives, shifting up the demand curve for native-born workers. As Figure 5-9 shows, this increase in native productivity raises the native wage from  $w_0$  to  $w_1$ . Moreover, some natives who previously did not find it profitable to work, now see the higher wage rate as an additional incentive to enter the labor market, and native employment also rises from  $N_0$  to  $N_1$ .

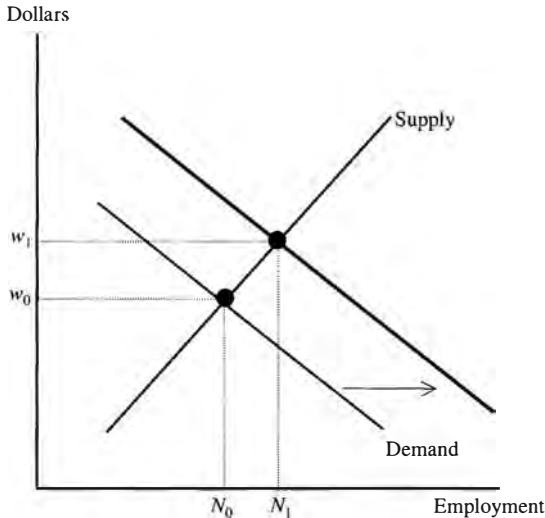
The discussion suggests a simple way to determine empirically if immigrants and natives are complements or substitutes in production. If they are substitutes, the earnings of native workers should be lower if they reside in labor markets where immigrants are in abundant supply. If they are complements, native earnings should be higher in those labor markets where immigrants tend to cluster.

Practically all the recent empirical research that attempts to determine how immigration alters the economic opportunities of native workers is based on this implication

Figure 5-9

### The Impact of Immigration When Immigrants and Natives Are Complements

If immigrants and natives are complements, they are not competing in the same labor market. The labor market in this figure denotes the supply and demand for native workers. Immigration makes natives more productive, shifting out the demand curve. This leads to a higher native wage and to an increase in native employment.



of the theoretical analysis. These studies typically compare native earnings in cities where immigrants are a substantial fraction of the labor force (for example, Los Angeles or New York) with native earnings in cities where immigrants are a relatively small fraction of the labor force (such as Pittsburgh or Nashville). Of course, native wages will vary among labor markets even if immigration did not exist. The validity of the analysis, therefore, hinges crucially on the extent to which all the other factors that generate dispersion in native wages across cities can be controlled for. These factors include geographic differences in the skills of natives, regional wage differentials, and variations in the level of economic activity.

There is a remarkable consensus in the many studies that estimate the correlation between the economic opportunities that native workers face in particular cities and measures of immigration in those cities.<sup>10</sup> This across-city correlation is probably slightly negative, so that the native wage is somewhat lower in those labor markets

<sup>10</sup>Jean B. Grossman, "The Substitutability of Natives and Immigrants in Production," *Review of Economics and Statistics* 54 (November 1982): 596–603; Joseph G. Altonji and David Card, "The Effects of Immigration on the Labor Market Outcomes of Less-Skilled Natives," in John M. Abowd and Richard B. Freeman, editors, *Immigration, Trade, and the Labor Market*. Chicago: University of Chicago Press, 1991, pp. 201–234; Robert J. LaLonde and Robert H. Topel, "Labor Market Adjustments to Increased Immigration," in John M. Abowd and Richard B. Freeman, editors, *Immigration, Trade, and the Labor Market*. Chicago: University of Chicago Press, 1991, pp. 267–299. The evidence is surveyed in George J. Borjas, "The Economics of Immigration," *Journal of Economic Literature* 32 (December 1994): 1667–1717.

where immigrants tend to reside. But the magnitude of this correlation is often very small. If one city has 10 percent more immigrants than another, the native wage in the city with the most immigrants may be only 0.2 percent lower. A doubling of the number of immigrants in the local labor market, therefore, reduces the native wage rate by only 2 percent. The evidence thus suggests that immigrants and natives are very weak substitutes in production.

It is often argued that African Americans are the one group whose economic progress is most likely to be hampered by the entry of immigrants into the United States.<sup>11</sup> The available evidence from the across-city studies, however, does not seem to support this claim. On the contrary, some studies report that African Americans residing in cities with relatively large numbers of immigrants actually have slightly higher wages than those residing in other labor markets.

### ***The Mariel Boatlift***

On April 20, 1980, Fidel Castro declared that Cuban nationals wishing to move to the United States could leave freely from the port of Mariel, Cuba. By September 1980, about 125,000 Cubans, mostly unskilled workers, had chosen to undertake the journey. The demographic impact of the *Marielitos* on Miami's population and labor force was sizable. Almost overnight, Miami's labor force had unexpectedly grown by 7 percent. A recent influential study, however, indicates that the trend of wages and employment opportunities for Miami's population, including its African-American population, was barely affected by the Mariel flow.<sup>12</sup> The economic trends in Miami between 1980 and 1985, in terms of wage levels and unemployment rates, were similar to those experienced by such cities as Atlanta, Houston, and Los Angeles, cities that did not experience the Mariel flow.

Consider, for example, the evidence summarized in Table 5-1. Prior to the Mariel flow, the black unemployment rate in Miami was 8.3 percent. This unemployment rate rose to 9.6 percent after the Mariel flow. Before we conclude that the *Marielitos* were responsible for this 1.3 percentage point increase in black unemployment in Miami, however, we have to determine what was happening in other comparable cities, cities that did not experience the Mariel flow. Perhaps because of the changes in the aggregate economy, it turns out that black unemployment was rising even faster in the control group, from 10.3 to 12.6 percent (or an increase of 2.3 points). If anything, therefore, it seems that the Mariel flow actually slowed down the rise in black unemployment, so that the difference-in-differences calculation (or  $1.3 - 2.3$ ) suggests that the Mariel flow is responsible for a 1.0 percentage point *decline* in the black unemployment rate.<sup>13</sup>

<sup>11</sup>See Daniel S. Hamernesh and Frank Bean, editors, *Help or Hindrance? The Economic Implications of Immigration for African-Americans*. New York: Russell Sage Press, 1998, for a collection of studies that analyze the impact of immigration on the economic well-being of black natives.

<sup>12</sup>David Card, "The Impact of the Mariel Boatlift on the Miami Labor Market," *Industrial and Labor Relations Review* 43 (January 1990): 245–257.

<sup>13</sup>It is important to point out, however, that the margin of error around this calculation is quite large, so that one cannot confidently conclude that the difference-in-differences estimate is statistically different from zero.

**TABLE 5-1** Immigration and the Miami Labor Market

	The Mariel Flow		The Mariel Flow That Did Not Happen	
	Before 1979	After 1981	Before 1993	After 1995
Unemployment rate of blacks in:				
Miami	8.3	9.6	10.1	13.7
Comparison cities	10.3	12.6	11.5	8.8
Difference-in-differences	-1.0	+6.3		

Sources: The 1979–1981 data are drawn from David Card, “The Impact of the Mariel Boatlift on the Miami Labor Market,” *Industrial and Labor Relations Review* 43 (January 1990): 251. The 1993–1995 data are drawn from Joshua D. Angrist and Alan B. Krueger, “Empirical Strategies in Labor Economics,” in Orley Ashenfelter and David Card, editors, *Handbook of Labor Economics*, Volume 3A. Amsterdam: North-Holland, 1999, Table 7. The comparison cities are Atlanta, Houston, Los Angeles, and Tampa–St. Petersburg.

The conclusion that even large and unexpected immigrant flows do not seem to adversely affect local labor market conditions is confirmed by the experience of other countries. For instance, 900,000 persons of European origin returned to France within 1 year after the independence of Algeria in 1962, increasing France’s labor force by about 2 percent. Nevertheless, there is no evidence that this increase in labor supply had a sizable impact on the affected labor markets.<sup>14</sup> Similarly, when Portugal lost the African colonies of Mozambique and Angola in the mid-1970s, nearly 600,000 persons returned to Portugal, increasing Portugal’s population by almost 7 percent. The *retornados* did not seem to have a large impact on the Portuguese economy.<sup>15</sup>

These studies provide excellent examples of the difference-in-differences methodology: measuring the impact of immigration by comparing what happened in the labor market of interest (that is, the treated group) with what happened in labor markets that were not penetrated by immigrants (the control group). Recent research, however, has raised some questions about the interpretation of the evidence generated by this approach—at least in the context of immigration.

In 1994, economic and political conditions in Cuba were ripe for the onset of a new boatlift of refugees into the Miami area, and thousands of Cubans began the hazardous journey. To prevent the refugees from reaching the Florida shore, the Clinton administration ordered the Navy to direct all the refugees toward the American military base in Guantanamo, Cuba. As a result, few of the potential migrants were able to migrate to Miami.

One can replicate the methodological design of the Mariel study by comparing Miami’s labor market conditions—relative to those of control cities—before and after

<sup>14</sup>Jennifer Hunt, “The Impact of the 1962 Repatriates from Algeria on the French Labor Market,” *Industrial and Labor Relations Review* 45 (April 1992): 556–572.

<sup>15</sup>William J. Carrington and Pedro de Lima, “The Impact of 1970s Repatriates from Africa on the Portuguese Labor Market,” *Industrial and Labor Relations Review* 49 (January 1996): 330–347.

“the Mariel boatlift that didn’t happen.”<sup>16</sup> It turns out that this nonevent *had* a substantial adverse impact on the unemployment rate of Miami’s black workers. The black unemployment rate in Miami rose from 10.1 to 13.7 percent between 1993 and 1995, as compared to a decline from 11.5 to 8.8 percent in a set of comparison cities. The difference-in-differences methodology [or  $3.6 - (-2.7)$ ] would then indicate that the unemployment rate of blacks in Miami *rose* by 6.3 percentage points.<sup>17</sup>

If one interprets this finding in the traditional way, it would seem to suggest that a phantom immigrant flow greatly affected the economic opportunities of black workers. This evidence obviously raises some questions about whether one should interpret the evidence for the Mariel boatlift that *did* happen as indicating that immigration had little impact on Miami’s labor market. More generally, the conflicting evidence reminds us of the importance of properly defining the “treatment” and “control” groups in any study that uses the difference-in-differences approach.

### **Do Natives Respond to Immigration?**

The fact that most U.S. studies find little evidence of a sizable adverse impact of immigration on native earnings raises two important questions. Why is the evidence so different from the typical presumption in the debate over immigration policy? And why does the evidence seem to be so inconsistent with the implications of the simplest supply-demand equilibrium model? After all, huge shifts in supply, like those observed in the Mariel flow or those observed when nearly 8 million immigrants entered the United States during a single decade (as happened in the 1980s), *should* affect the wage level in the labor market.

An important problem with the conceptual approach that underlies the interpretation of the across-city correlations (that is, Figure 5-8 in the case of perfect substitutes and Figure 5-9 in the case of complements) is that these models only describe what happens in the short run. The entry of immigrants into the local labor market may well lower the wage of competing workers and increase the wage of complementary workers *initially*. Over time, however, natives will likely respond to immigration. After all, it is not in the best interest of native-owned firms or native workers to sit idly by and watch immigrants change economic opportunities. All natives now have incentives to change their behavior in ways that take advantage of the altered economic landscape.

Suppose, for instance, that immigrants and natives are perfect substitutes. The natives who live in the areas impacted by immigration may then choose to move to other localities, as illustrated in Figure 5-10. We’ll use Los Angeles and Pittsburgh as examples. Initially, the native wage  $w_0$  is the same in both cities, with equilibrium occurring at the intersection of supply curve  $S_0$  and the demand curve in each of the cities (at points  $P_{LA}$  and  $P_{PT}$ , respectively). Los Angeles then receives an influx of immigrants. Assuming that immigrants and natives are perfect substitutes in production, the supply curve shifts in the Los Angeles market to  $S_1$ , and the wage declines to  $w_{LA}$ .

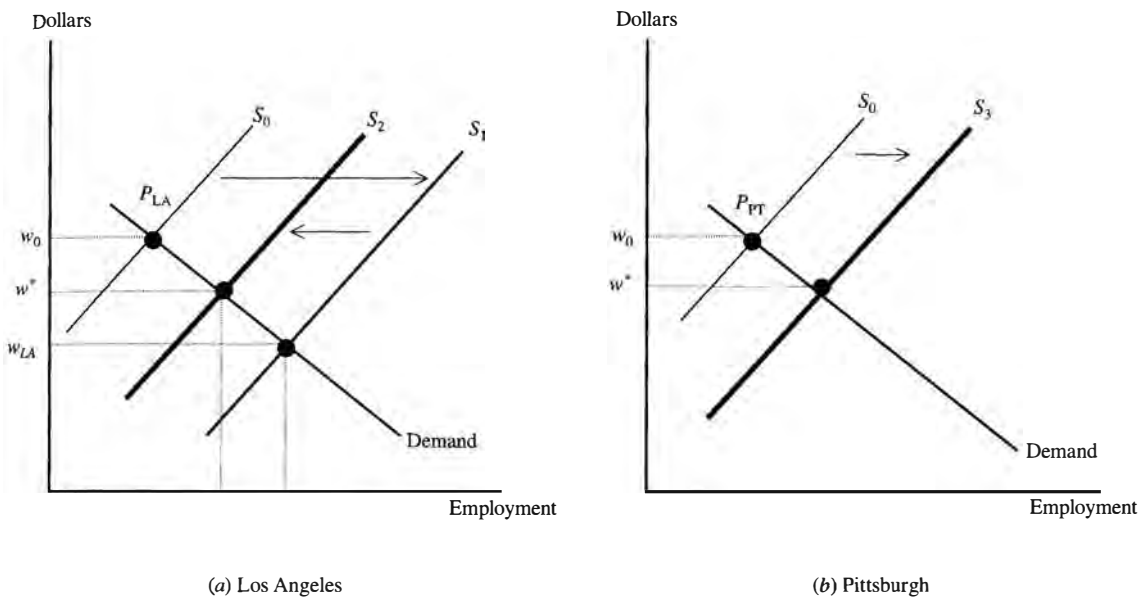
<sup>16</sup>Joshua D. Angrist and Alan B. Krueger, “Empirical Strategies in Labor Economics,” in Orley Ashenfelter and David Card, editors, *Handbook of Labor Economics*, Volume 3A. Amsterdam: North-Holland, 1999.

<sup>17</sup>Moreover, it turns out that the margin of error around this quantity is sufficiently small that the estimate is significantly different from zero.

Figure 5-10

## The Native Labor Market's Response to Immigration

Initially, the two local labor markets are in equilibrium at wage  $w_0$ . The entry of immigrants into Los Angeles shifts the supply curve from  $S_0$  to  $S_1$ , and lowers the wage to  $w_{LA}$ . The lower wage induces some LA natives to move to Pittsburgh, shifting the supply curve back from  $S_1$  to  $S_2$ , and shifting the supply curve in Pittsburgh to  $S_3$ . The markets reestablish equilibrium at wage  $w^*$ . All natives earn less as a result of immigration, regardless of where they live.



The decline in the equilibrium wage in the Los Angeles labor market is likely to induce some natives to move to Pittsburgh, a city that did not receive an immigrant flow.<sup>18</sup> As a result, the supply curve of native workers shifts in both cities. As natives move out of Los Angeles and the supply curve shifts to the left (to  $S_2$ ), the native wage rises slightly to  $w^*$ . As the natives move to Pittsburgh and the supply curve in that market shifts to the right (to  $S_3$ ), the wage of natives declines to  $w^*$ . If migration between the two cities is costless, natives will migrate until wages are again the same in the two cities. Native migration decisions, therefore, lead to an equilibrium where natives in cities with many immigrants are no worse off than natives in cities with few immigrants. This conclusion, however, disguises the fact that *all* natives, regardless of where they live, are now worse off as a result of immigration.

The forces that tend to equalize economic opportunities across labor markets are reinforced by the fact that native-owned firms will also respond. For example, employers see that cities flooded by less-skilled immigrants tend to pay lower wages to less-skilled workers. Employers who demand this type of labor will want to relocate to those cities, and entrepreneurs thinking about starting up new firms will find it more profitable to open them in immigrant areas. In other words, immigration increases the

<sup>18</sup>The argument assumes that immigrants arrive in Los Angeles and remain there.



returns to capitalists in the affected cities, and capital will naturally flow to the areas where the returns are the highest. The flow of jobs to the immigrant-hit areas helps cushion the adverse effect of immigration on the wage of competing workers in these localities.

These intercity flows of labor and capital create difficult problems if one wants to measure the labor market impact of immigration by comparing the economic opportunities of native workers in different cities. Using across-city correlations to measure the impact of immigration will not be very revealing because the flows of native-born workers and native-owned capital effectively diffused the impact of immigration throughout the national economy. In the end, all workers who compete with immigrants, regardless of where they live, are worse off because there are now many more such workers. Therefore, as long as workers and firms respond to the entry of immigrants by “voting with their feet,” there is little reason to expect a correlation between the earnings of native workers in particular cities and the presence of immigrants. In short, the comparison of local labor markets may be hiding the “macro” impact of immigration.

The evidence suggests that native migration patterns may be affected by the presence of immigrants. For example, there seems to be a negative correlation between the immigration rates of natives into particular cities and the presence of immigrants in those cities.<sup>19</sup> In other words, natives are less likely to move into those cities where immigrants tend to reside.

Figure 5-11 presents what is perhaps the most suggestive evidence of a potential relation between immigration and native migration decisions. The resurgence of immigration in the United States began after 1968, when policy changes enacted in 1965 became effective. It seems natural, therefore, to contrast pre-1970 changes in the residential location of the native population with post-1970 changes to assess the effects of immigration on native location decisions.

Not surprisingly, the share of natives who lived in California, the major immigrant-receiving state, was rising rapidly prior to 1970. What is surprising, however, is that the share of natives living in California barely budged between 1970 and 1990. Nevertheless, California’s share of the *total* population kept rising continuously until 1990, from 7 percent in 1950, to 10 percent in 1970, to 12 percent in 1990. Put differently, an extrapolation of the population growth that existed before 1970—*before the resurgence of immigration*—would have predicted the state’s 1990 share of the population quite accurately. But, whereas natives pouring into the state fueled California’s population growth before 1970, immigrants alone fueled the post-1970 growth.

How should one interpret this fact? One interpretation is that around 1970, for reasons unknown, Americans simply stopped moving to California. In other words, if it were not for immigration, California’s rapid population growth would have stalled in

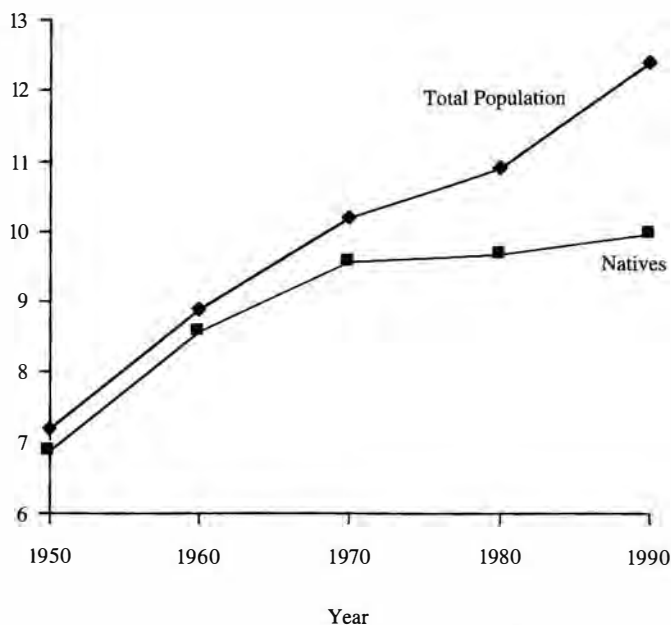
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<sup>19</sup>Randall Filer, “The Effect of Immigrant Arrivals on Migratory Patterns of Native Workers,” in George J. Borjas and Richard B. Freeman, editors, *Immigration, Trade, and the Labor Market: Economic Consequences for the United States and Source Areas*. Chicago: University of Chicago Press, 1992, pp. 245–269; William H. Frey, “The New White Flight,” *American Demographics* 16 (April 1994): 40–48. Conflicting evidence is presented in David Card, “Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration,” National Bureau of Economic Research Working Paper No. 5927, February 1997.

Figure 5-11

## Trends in California's Population, 1950–1990

Percent of U.S. Population Living in California



Source: George J. Borjas, Richard B. Freeman, and Lawrence F. Katz, "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on Economic Activity* 1 (1997):27. The data refer to persons aged 18-64 who are not living in group quarters.

the 1970s and 1980s. An alternative—and more controversial—interpretation is that immigration into California essentially “displaced” the population growth that *would have occurred* in the immigrants’ absence, and this displacement effectively diffused the economic impact of immigration from California to the rest of the country.

The possibility that comparisons of local labor markets do not provide valuable information about the economic impact of immigration has motivated some researchers to search for this impact at the level of the national labor market. The “factor proportions approach” compares the country’s actual supplies of workers in particular skill groups to those it would have had in the absence of immigration, and then uses outside information on how relative wages respond to changes in relative supplies to calculate the wage consequences of immigration.<sup>20</sup> Suppose, for instance, that in the absence of immigration there would be one unskilled worker per skilled worker in the

<sup>20</sup>George J. Borjas, Richard B. Freeman, and Lawrence F. Katz, “On the Labor Market Impacts of Immigration and Trade,” in George J. Borjas and Richard B. Freeman, editors, *Immigration and the Work Force: Economic Consequences for the United States and Source Areas*. Chicago: University of Chicago Press, 1992, pp. 213–244. Related applications include Richard B. Freeman, “Manpower Requirements and Substitution Analysis of Labor Skills: A Synthesis,” *Research in Labor Economics* 1 (1977): 151–183; and George E. Johnson, “The Demand for Labor by Educational Category,” *Southern Economic Journal* 37 (October 1970): 190–204.

national economy. Immigration may change this “factor proportion” so that there are now two unskilled workers per skilled worker. Such a change in factor proportions should widen the wage gap between skilled and unskilled workers. If existing research on labor demand elasticities provides a measure of the responsiveness of relative wages to changes in factor proportions, one could then use this estimate to “simulate” the impact of immigration on the wage gap between skilled and unskilled workers in the national economy.

A recent study documents that immigration increased the supply of workers who were high school dropouts by 21 percent between 1979 and 1995, but increased the supply of workers with at least a high school diploma by only 4 percent.<sup>21</sup> This change in the factor proportions could have widened the wage gap between skilled and unskilled workers by as much as 5 percentage points. It is well known that the wage gap between skilled and unskilled workers rose dramatically during this period (and we will discuss this trend in more detail in Chapter 8). Immigration may then account for about 44 percent of the widening in the wage gap between the two groups of workers.

There is an important sense in which the factor proportions approach is unsatisfactory. The approach does not estimate the impact of immigration on the labor market by *directly* observing how this shock affects some workers and not others. Instead, the factor proportions approach *simulates* the impact of immigration at the national level. It takes as “fact” the level of responsiveness between relative wages and relative supplies uncovered in studies of labor demand—and then uses this elasticity to mechanically predict the consequences of immigration. The simulation, therefore, relies heavily on a theoretical framework that tells us how the U.S. labor market translates changes in relative supplies into changes in relative wages. The results of the factor proportions approach, therefore, are very sensitive to the assumptions that a researcher makes about the way the labor market works and about the value of the labor demand elasticity linking changes in relative wages to relative supplies.

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## 5-5 THE COBWEB MODEL

Our analysis of labor market equilibrium assumes that markets adjust instantaneously to shifts in either supply or demand curves so that wages and employment change swiftly from the old equilibrium levels to the new. Many labor markets, however, do not adjust so quickly to shifts in the underlying supply and demand curves. There is some evidence, in fact, that markets for highly skilled workers, such as engineers and other specialized professionals, exhibit systematic periods of booms and busts which dispute the notion that labor markets attain competitive equilibrium quickly and cheaply.

Consider, for example, the market for new engineering graduates. It has long been recognized that the market for newly minted engineers fluctuates regularly between periods of excess demand for labor and periods of excess supply. As a result, there is a

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<sup>21</sup>George J. Borjas, Richard B. Freeman, and Lawrence F. Katz, “How Much Do Immigration and Trade Affect Labor Market Outcomes?” *Brookings Papers on Economic Activity* (1997): 1–67.