

Chapter 9

Labor Mobility

I'm going home
And when I want to go home, I'm going mobile

—*Pete Townshend*

The allocation of workers to firms implied by a competitive labor market equilibrium maximizes the total value of labor's product. Workers are continually searching for higher-paying jobs and firms are searching for cheaper workers. As a result of these search activities, the value of marginal product of labor is equated across firms and across labor markets (for workers of given skills). The equilibrium allocation of workers and firms, therefore, is efficient. No other allocation can increase the value of labor's contribution to national income.

Needless to say, actual labor markets are not quite so neat. Workers often do not know their own skills and abilities and are ill informed about the opportunities available in other jobs or in other labor markets. Firms do not know the true productivity of the workers they hire. As in a marriage, information about the value of the match between the worker and the firm is revealed slowly as both parties learn about each other. Therefore, the existing allocation of workers and firms is not efficient and other allocations are possible that would increase national income.

This chapter studies the determinants of **labor mobility**, the mechanism that labor markets use to improve the allocation of workers to firms. There is a great deal of mobility in the labor market. In fact, it seems as if the U.S. labor market is in constant flux: Nearly 4 percent of workers in their early twenties switch jobs in any given month, 3 percent of the population moves across state lines in a year, and nearly 1.4 million legal and illegal immigrants enter the country annually. This chapter argues that all these "flavors" of labor mobility are driven by the same fundamental factors: Workers want to improve their economic situation and firms want to hire more productive workers.

The analysis of labor mobility helps us address a number of key questions in labor economics: What are the determinants of migration? How do the migrants differ from the persons who choose to stay? What factors determine how migrants are self-selected? What are the consequences of migration, both for the migrants themselves and for the localities that

they move to? Do the migrants gain substantially from their decision? And how large are the efficiency gains from migration?

9-1 Geographic Migration as a Human Capital Investment

In 1932, Nobel Laureate John Hicks proposed that “differences in net economic advantages, chiefly differences in wages, are the main causes of migration.”¹ Practically all modern analysis of migration decisions uses this hypothesis as the point of departure and views the migration of workers as a form of human capital investment. Workers calculate the value of the employment opportunities available in each of the alternative labor markets, net out the costs of making the potential move, and choose whichever option maximizes the net present value of lifetime earnings.

The study of the migration decision, therefore, is a simple application of the human capital framework set out in Chapter 7. Suppose there are two specific labor markets where the worker can be employed. These labor markets might be in different cities, in different states, or perhaps even in different countries. Suppose that the worker is currently employed in New York and is considering the possibility of moving to California. The worker, who is 20 years old, now earns w_{20}^{NY} dollars. If he were to move, he would earn w_{20}^{CA} dollars. It costs M dollars to move to California. These migration costs include the actual expenditures incurred in transporting the worker and his family (such as airfare and the costs of moving household goods), as well as the dollar value of the “psychic cost”—the pain and suffering that inevitably occurs when one moves away from family, friends, and social networks.

Like all other human capital investments, migration decisions are guided by the comparison of the present value of lifetime earnings in the alternative employment opportunities. Let PV^{NY} be the present value of the earnings stream if the person stays in New York. This quantity is given by

$$PV^{NY} = w_{20}^{NY} + \frac{w_{21}^{NY}}{(1+r)} + \frac{w_{22}^{NY}}{(1+r)^2} + \dots \quad (9-1)$$

where r is the discount rate and the sum in equation (9-1) continues until the worker reaches retirement age. Similarly, the present value of the earning stream if the person moves to California is given by

$$PV^{CA} = w_{20}^{CA} + \frac{w_{21}^{CA}}{(1+r)} + \frac{w_{22}^{CA}}{(1+r)^2} + \dots \quad (9-2)$$

The net gain to migration is then given by

$$\text{Net gain to migration} = PV^{CA} - PV^{NY} - M \quad (9-3)$$

The worker moves if the net gain is positive.

A number of empirically testable propositions follow immediately from this framework:

1. An improvement in the economic opportunities available in the destination increases the net gains to migration and raises the likelihood that the worker moves.

¹ John R. Hicks, *The Theory of Wages*, London: Macmillan, 1932, p. 76; see also Larry A. Sjaastad, “The Costs and Returns of Human Migration,” *Journal of Political Economy* 70 (October 1962): 80–93.

2. An improvement in the economic opportunities at the current region of residence decreases the net gains to migration and lowers the probability that the worker moves.
3. An increase in migration costs lowers the net gains to migration and reduces the likelihood of a move.

All these implications deliver the same basic message: Migration occurs when there is a good chance that the worker will recoup his investment.²

9-2 Internal Migration in the United States

The United States is a very mobile country. Between 2003 and 2004, 2.8 percent of the population moved across counties within the same state, and another 2.6 percent moved across states.³ Many studies have attempted to determine if the size and direction of these migration flows (or “internal migration”) are consistent with the notion that workers migrate in search of better employment opportunities.⁴ These empirical studies often relate the rate of migration between any two regions to variables describing differences in economic conditions in the regions (such as wages and unemployment rates) and to a measure of migration costs (typically the distance involved in the move).

The Impact of Region-Specific Variables on Migration

The evidence indicates that the probability of migration is sensitive to the income differential between the destination and the origin. A 10-percentage-point increase in the wage differential between the states of destination and origin increases the probability of migration by about 7 percentage points.⁵ There is also a positive correlation between employment conditions and the probability of migration. A 10-percentage-point increase in the rate of employment growth in the state of origin reduces the probability of migration by about 2 percent. Finally, many empirical studies report a negative correlation between the probability of migration and distance, where distance is often interpreted as a measure of migration costs.⁶ A doubling of the distance between destination and origin reduces the migration rate by about 50 percent. Therefore, the evidence is consistent with the hypothesis that workers move to those regions that maximize the present value of lifetime earnings.

² Although our discussion focuses on a worker’s choice between two regions, the same insights can be derived if the worker were choosing a location from many alternative regions, such as the 50 states of the United States. The worker would then calculate the present value of earnings in each of the 50 states and would choose the one that maximized the present value of lifetime earnings net of migration costs.

³ U.S. Bureau of the Census, “Geographic Mobility: March 2004,” Table 1, “General Mobility, by Region, Sex, and Age: 2004,” www.census.gov/population/www/socdemo/migrate.html.

⁴ Michael Greenwood, “Internal Migration in Developed Countries,” in Mark R. Rosenzweig and Oded Stark, editors, *Handbook of Population and Family Economics*, vol. 1B, Amsterdam: Elsevier, 1997, pp. 647–720, surveys the literature.

⁵ Robert A. Naskoteen and Michael Zimmer, “Migration and Income: The Question of Self-Selection,” *Southern Economic Journal* 46 (January 1980): 840–51; see also John Kennan and James R. Walker, “The Effect of Expected Incomes on Individual Migration Decisions,” National Bureau of Economic Research Working Paper No. 9585, March 2003.

⁶ Aba Schwarz, “Interpreting the Effect of Distance on Migration,” *Journal of Political Economy* 81 (September/October 1973): 1153–69.

These correlations help us understand the direction of some of the major internal migration waves in the United States. Between 1900 and 1960, for example, there was a sizable and steady flow of African-American workers from the rural South to the industrialized cities of the North.⁷ In 1900, 90 percent of the African-American population lived in the South; by 1950, the fraction of African Americans living in the South had declined to 68 percent and, by 1960, to 60 percent. The size and direction of this migration should not be too surprising. The availability of better employment opportunities in the booming manufacturing sector of northern cities (as well as the possibility of encountering less racial discrimination in both the labor market and the public school system) obviously persuaded many blacks to move north.⁸

Similarly, during much of the postwar period, California's booming economy attracted many workers from other states. Partly as a consequence of the downsizing of the defense industry, California's employment declined by 750,000 jobs between 1990 and 1993, and California's unemployment rate soared to 9.1 percent (as compared to a national unemployment rate of 7.0 percent).⁹ As a result, the direction of the migration flow between California and the rest of the country took a U-turn in the early 1990s, and California became a source of, rather than a destination for, internal migrants.

The Impact of Worker Characteristics on Migration

We have seen that region-specific variables (such as mean incomes in the origin and destination states) play a major role in migration decisions. Many studies also indicate that demographic characteristics of workers such as age and education also play an important role. Migration is most common among younger and more-educated workers.

Figure 9-1 illustrates the relationship between age and the probability that a worker will migrate across state lines in any given year. This probability declines systematically over the working life. About 7 percent of college graduates in their twenties move across state lines, but the probability declines to 1 percent for college graduates in their fifties.

Older workers are less likely to move because migration is a human capital investment. As a result, older workers have a shorter period over which they can collect the returns to the migration investment. The shorter payoff period decreases the net gains to migration and hence lowers the probability of migration.

There is also a positive correlation between a worker's educational attainment and the probability of migration. As Figure 9-1 also shows, college graduates move across state lines at a substantially higher rate than high school graduates. The positive impact of education on migration rates might arise because highly educated workers may be more efficient at learning about employment opportunities in alternative labor markets, thus reducing migration costs. It is also possible that the geographic region that makes up the relevant labor market for highly educated workers is larger than the geographic region that makes up the labor market for the less educated. Consider, for instance, the labor market faced by college professors. Not only are there few "firms" in any given city, but also professors'

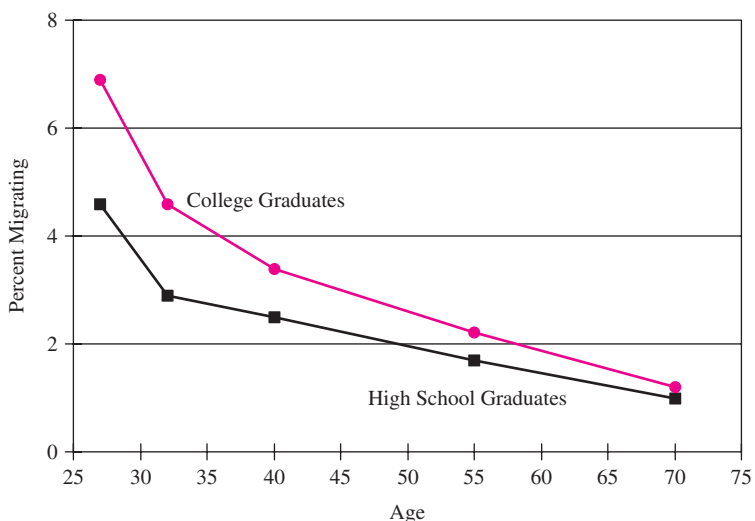
⁷ Nicholas Lemann, *The Promised Land: The Great Black Migration and How It Changed America*, New York: Knopf, 1991.

⁸ For a recent study of this migration, see Leah Platt Boustan, "Competition in the Promised Land: Blacks, Migration, and Northern Labor Markets, 1940–1970," UCLA Working Paper, May 2006.

⁹ See "California in the Rearview Mirror," *Newsweek*, July 19, 1993, pp. 24–25.

FIGURE 9-1
Probability of
Migrating
across State
Lines in
2003–2004, by
Age and
Educational
Attainment

Source: U.S. Bureau of the Census, "Geographic Mobility: 2004," Table 6. "General Mobility of Persons 25 Years and Over, by Region, Age, and Educational Attainment," www.census.gov/population/socdemo/migration/cps2004/tab06-1.xls.



skills are very portable across colleges and universities. In effect, college professors sell their skills in a national (and often even an international) labor market.

As noted earlier, geographic migration helps improve the quality of the match between workers and firms. The data suggest that workers gain substantially from the migration, getting a wage increase of over 10 percent.¹⁰ Because workers move to areas that offer better employment opportunities, internal migration also reduces wage differentials across regions and improves labor market efficiency. As we saw in Chapter 5, there is evidence that wages across states in the United States are converging, and some of this convergence is caused by internal migration flows.

Return and Repeat Migration

Workers who have just migrated are extremely likely to move back to their original locations (generating **return migration** flows) and are also extremely likely to move onward to still other locations (generating **repeat migration** flows). The probability of a migrant returning to the state of origin within a year is about 13 percent, and the probability of a migrant moving on to yet another location is 15 percent.¹¹

Unless economic conditions in the various states change drastically soon after the migration takes place, the high propensity of migrants to move again is *not* consistent with the income-maximization model we developed earlier. Prior to the initial migration, the

¹⁰ Anthony M. J. Yezer and Lawrence Thurston, "Migration Patterns and Income Change: Implications for the Human Capital Approach to Migration," *Southern Economic Journal* 42 (April 1976): 693–702; and Kenneth E. Grant and John Vanderkamp, "The Effects of Migration on Income: A Micro Study with Canadian Data," *Canadian Journal of Economics* 13 (August 1980): 381–406.

¹¹ Julie DaVanzo, "Repeat Migration in the United States: Who Moves Back and Who Moves On?" *Review of Economics and Statistics* 65 (November 1983): 552–59; see also Christian Dustmann, "Return Migration, Wage Differentials, and the Optimal Migration Duration," *European Economic Review* 47 (April 2003): 353–67.

worker's cost-benefit calculation indicated that a move from, say, Illinois to Florida maximized his present value of lifetime earnings (net of migration costs). How can a similar calculation made just a few weeks after the move indicate that returning to Illinois or perhaps moving on to Texas maximizes the worker's income?

Two factors can generate return and repeat migration flows. Some of these flows arise because the worker has learned that the initial migration decision was a mistake. After all, a worker contemplating the move from Illinois to Florida faces a great deal of uncertainty about economic conditions in Florida. Once he arrives in Florida, he might discover that the available employment opportunities—or local amenities—are far worse than expected. Return and repeat migration flows arise as workers attempt to correct these errors.

Return or repeat migration also might be the career path that maximizes the present value of lifetime earnings in some occupations, even in the absence of any uncertainty about job opportunities. For instance, lawyers who specialize in tax law quickly realize that a brief stint at the Department of the Treasury, the Department of Justice, or the Internal Revenue Service in Washington, DC, provides them with valuable human capital. This human capital includes intricate knowledge of the tax code as well as personal connections with policymakers and other government officials. After their government service, the lawyers can return to their home states or can move to other areas of the country where their newly acquired skills will be highly rewarded. In effect, the temporary stay of the lawyers in the District of Columbia is but one rung in the career ladder that maximizes lifetime earnings.¹²

There is evidence supporting the view that return and repeat migration flows are generated both by mistakes in the initial migration decision and by stepping-stone career paths.¹³ For instance, workers who move to a distant location are more likely to return to their origin. Persons who move far away probably have imprecise information about the true economic conditions at the destination, increasing the probability that the original move was a mistake and making repeat or return migration more likely. It is also the case that highly educated persons are more likely to engage in repeat migration. This finding is consistent with the hypothesis that skills acquired in one particular location can be profitably marketed in another.

Why Is There So Little Migration?

Even though the United States is a very mobile country, the volume of internal migration is not sufficient to completely equalize wages across regions. Only about half of the wage gap between any two regions disappears after 30 years.¹⁴ The persistence of regional wage

¹² A theory of human capital investments and occupational choice based on this stepping-stone hypothesis is presented in Sherwin Rosen, "Learning and Experience in the Labor Market," *Journal of Human Resources* 7 (Summer 1972): 326–42.

¹³ DaVanzo, "Repeat Migration in the United States"; Julie DaVanzo and Peter A. Morrison, "Return and Other Sequences of Migration in the United States," *Demography* 18 (February 1981): 85–101. A study of return migration in the Canadian context is given by Jennifer Hunt, "Are Migrants More Skilled Than Non-migrants? Repeat, Return, and Same-Employer Migrants," *Canadian Journal of Economics* 37 (November 2004): 830–49.

¹⁴ Robert J. Barro and Xavier Sala-i-Martin, "Convergence across States and Regions," *Brookings Papers on Economic Activity* (1991): 107–58; and Olivier Jean Blanchard and Lawrence F. Katz, "Regional Evolutions," *Brookings Papers on Economic Activity* 1 (1992): 1–61.

differentials raises an important question: Why do more people *not* take advantage of the higher wage in some regions?

The human capital model suggests an answer: Migration costs must be very high. In fact, one can easily apply the model to get a rough idea of the magnitude of these costs. In 2003, average annual compensation per worker was approximately \$22,000 in Puerto Rico and \$51,000 in the United States.¹⁵ Because Puerto Ricans are U.S. citizens by birth, there are no legal restrictions limiting their entry into the United States. In fact, the large income gap has induced around a quarter of the Puerto Rican population to migrate to the United States in the past 50 years.¹⁶ But, just as important, 75 percent of Puerto Ricans chose not to move.

Let w_{PR} be the wage the worker can earn in Puerto Rico and let w_{US} be the wage he can earn in the United States. For simplicity, let's assume these wages are constant over the life cycle. It turns out that if the sums in equations (9-1) and (9-2) have many terms—so that the worker lives on practically forever—we can write the discounted present values as¹⁷

$$PV_{PR} = \frac{(1+r)w_{PR}}{r} \quad \text{and} \quad PV_{US} = \frac{(1+r)w_{US}}{r} \quad (9-4)$$

The human capital framework indicates that a worker is indifferent between moving and staying if the discounted gains from moving are exactly equal to migration costs:

$$\frac{(1+r)(w_{US} - w_{PR})}{r} = M \quad (9-5)$$

To get an idea of how large M must be in order to make a worker indifferent, consider the following algebraic rearrangement of equation (9-5): Divide both sides by w_{PR} and define $\pi = M/w_{PR}$. The variable π gives the fraction of a worker's salary in Puerto Rico that is spent on migration costs. We can then rewrite the equation as

$$\frac{(1+r)(w_{US} - w_{PR})}{r w_{PR}} = \pi \quad (9-6)$$

The ratio $(w_{US} - w_{PR})/w_{PR}$ is around 1.2, indicating that a worker can increase his income by 120 percent by migrating to the United States. If the rate of discount is 5 percent, the left-hand side of equation (9-6) takes on the value of 25. In other words, migration costs for a worker who is indifferent between migrating to the United States and staying in Puerto

¹⁵ U.S. Department of Commerce, *Statistical Abstract of the United States, 2006*, Washington, DC: Government Printing Office, 2002, Tables 627, 1302; see www.census.gov/compendia/statab/. These differences remain large even if income is adjusted for differences in purchasing power. In 2005, per capita GDP (in PPP dollars) was \$18,600 in Puerto Rico and \$41,800 in the United States; see U.S. Central Intelligence Agency, *The World Factbook, 2006*, Washington, DC: Government Printing Office, 2006, available at www.cia.gov/cia/publications/factbook/index.html.

¹⁶ Fernando Ramos, "Out-Migration and Return Migration of Puerto Ricans," 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. 49–66.

¹⁷ Let $S = 1 + 1/(1+r) + 1/(1+r)^2$ and so on. This implies that $(1+r)S = (1+r) + 1 + 1/(1+r) + 1/(1+r)^2$ and so on. After canceling out many terms, the difference $(1+r)S - S = 1+r$, so $S = (1+r)/r$.

Theory at Work

MIGRATION AND EU EXPANSION

The freedom of movement of persons—together with the freedom of movement of capital, goods, and services—is a general right within the European Union. In theory, the creation of a single market should create many additional employment and earnings opportunities for the workers in the member states of the EU. The unimpeded flows of labor, capital, goods, and service also should greatly reduce intercountry wage differentials within the community.

In 1998, the European Union began to negotiate entry conditions for several central and eastern European countries, including the Czech Republic, Estonia, Hungary, and Poland. An important concern was the possibility that migration flows into the richer member states from the acceding countries would cause downward pressures on wages in the richer states and further aggravate the serious unemployment problem that already exists in many EU countries.

In the past, these concerns had encouraged EU negotiators to propose a “transition period” during which citizens from the acceding countries would face some restrictions if they wished to migrate within the EU. In fact, this transition period was part of the agreement that enabled the entry of Greece, Portugal, and Spain into the community. Although there was fear that the

accession of these countries would generate substantial population flows, these migration flows never materialized. In 1993, 17 million foreigners lived in the various EU countries, but only about 5 million of these foreigners originated in other EU countries. These “EU internal immigrants” accounted for only 1.3 percent of the EU population.

Media reports and politicians in the EU now claim that perhaps 40 million eastern Europeans will take advantage of the open borders and migrate west. But this scenario is unlikely to occur. The combination of large migration costs—particularly across countries that differ in language and culture—and relatively small (and narrowing) wage gaps suggests that the migration gains are not sufficiently large to generate large population flows. A careful analysis of the available data concludes that perhaps 3 percent of the population of the acceding countries (or around 3 million people) will migrate west within the next 15 years. These immigrants would increase the population of the current European Union by less than 1 percent.

Source: Thomas K. Bauer and Klaus F. Zimmermann, *Assessment of Possible Migration Pressure and Its Labour Market Impact Following EU Enlargement to Central and Eastern Europe*, Bonn: IZA Research Report No. 3, July 1999.

Rico are 25 times his salary. If this worker earns the average income in Puerto Rico (or \$22,000), migration costs are around \$550,000!¹⁸

What exactly is the nature of these costs? This quantity obviously does not represent the cost of transporting the family and household goods to a new location in the United States. Instead, the marginal Puerto Rican probably attaches a very high utility to the social and cultural amenities associated with remaining in his birthplace. Needless to say, migration costs are likely to be even larger in other contexts—such as international migration, where there are legal restrictions and much greater differences in language and culture. In short, although internal migration increases labor market efficiency, the gains are limited by the fact that regional wage differentials are likely to persist because the flow of migrants is not sufficiently large.

¹⁸ A more sophisticated analysis of the cost of interstate migration in the United States reaches a similar result, concluding that the migration cost is over \$250,000 for young workers; see John Kennan and James R. Walker, “The Effect of Expected Incomes on Individual Migration Decisions,” University of Wisconsin, Madison, Working Paper, May 2006.

9-3 Family Migration

Thus far, our discussion of geographic migration focuses on the choices made by a single worker as he or she compares employment opportunities across regions and chooses the one location that maximizes the present value of lifetime earnings. However, most migration decisions are not made by single workers, but by families. The migration decision, therefore, should not be based on whether a particular member of the household is better off at the destination than at the origin, but on whether the family *as a whole* is better off.¹⁹

The impact of the family on the migration decision can be easily described. Suppose that the household is composed of two persons, a husband and a wife. Let's denote by ΔPV_H the change in the present value of the husband's earnings stream if he were to move geographically (say from New York to California). And let ΔPV_W be the change in the present value of the wife's earnings stream if she were to make the same move. Note that ΔPV_H also can be interpreted as the husband's gains to migration if he were single and were making the migration decision completely on his own. These gains are called the husband's "private" gains to migration. If the husband were not tied down by his family responsibilities, he would migrate if the private gains ΔPV_H were positive. Similarly, the quantity ΔPV_W gives the wife's private gains to migration. If she were single, she would move if ΔPV_W were positive.

The family unit (that is, the husband and the wife) will move if the *family's* net gains are positive:

$$\Delta PV_H + \Delta PV_W > 0 \quad (9-7)$$

In other words, the family migrates if the sum of the private gains to the husband and to the wife is positive.

Figure 9-2 illustrates the basic ideas. The vertical axis in the figure measures the husband's private gains to migration, and the horizontal axis measures the wife's private gains. As noted above, if the husband were making the migration decision completely on his own, he would migrate whenever ΔPV_H was positive, which is given by the outcomes that lie above the horizontal axis (or the combination of areas *A*, *B*, and *C*). Similarly, if the wife were making the migration decision on her own, she would migrate whenever ΔPV_W was positive, which is given by the outcomes to the right of the vertical axis (or areas *C*, *D*, and *E*).

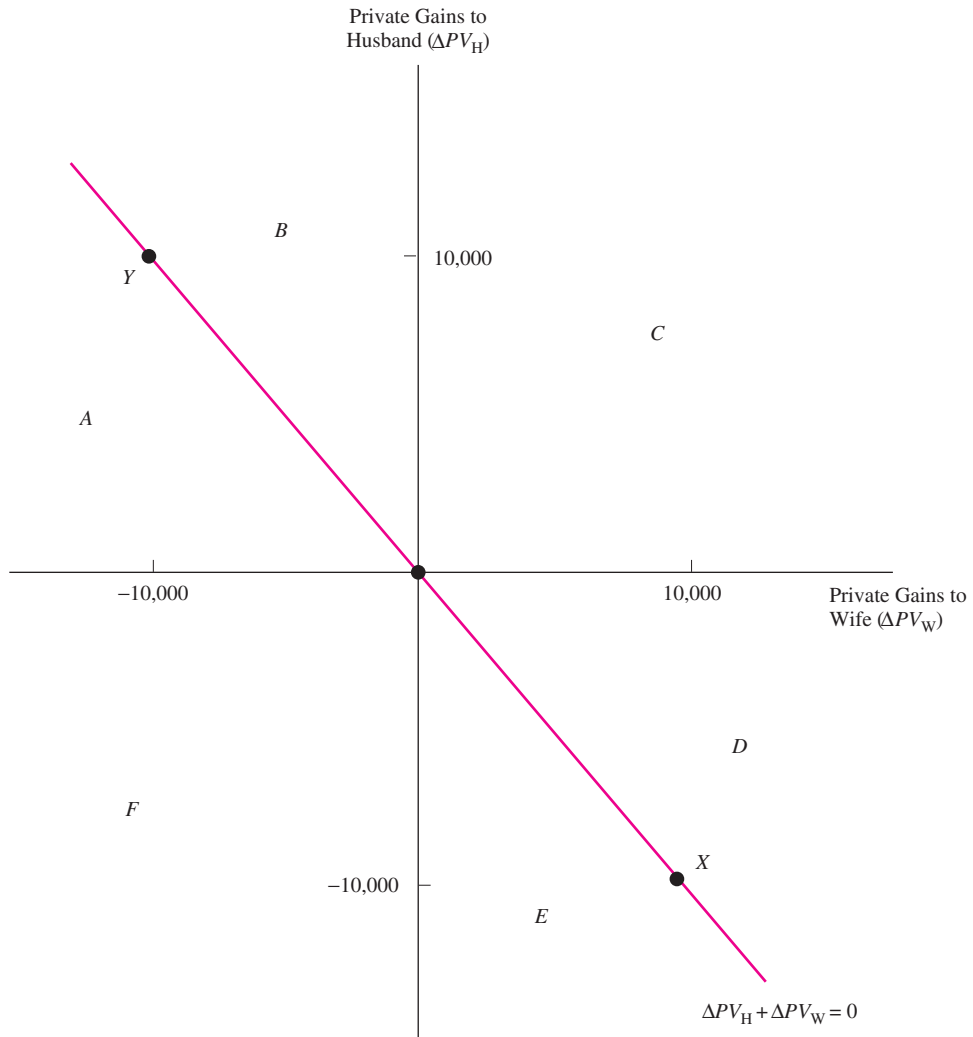
Let's now examine the family's migration decision. The 45° downward-sloping line that goes through the origin connects the points where the net gains to the family are zero, or $\Delta PV_H + \Delta PV_W = 0$. The family might have zero gains from migration in a number of ways. For instance, at point *X*, the wife gains \$10,000 if she were to move, but the husband loses \$10,000. At point *Y*, the husband gains \$10,000, but the wife loses \$10,000.

The family moves if the sum of the private gains $\Delta PV_H + \Delta PV_W$ is positive. The family's decision to maximize the *family's* lifetime earnings implies that the family will move

¹⁹ Jacob Mincer, "Family Migration Decisions," *Journal of Political Economy* 86 (October 1978): 749–73; Julie DaVanzo, "Why Families Move: A Model of the Geographic Mobility of Married Couples," Report No. R-1972-DOL, Santa Monica, CA: The Rand Corporation, 1976; and Steven Sandell, "Women and the Economics of Family Migration," *Review of Economics and Statistics* 59 (November 1977): 406–14.

FIGURE 9-2 Tied Movers and Tied Stayers

If the husband were single, he would migrate whenever $\Delta PV_H > 0$ (or areas *A*, *B*, and *C*). If the wife were single, she would migrate whenever $\Delta PV_W > 0$ (or areas *C*, *D*, and *E*). The family migrates when the sum of the private gains is positive (or areas *B*, *C*, and *D*). In area *D*, the husband would not move if he were single but moves as part of the family, making him a tied mover. In area *E*, the wife would move if she were single but does not move as part of the family, making her a tied stayer.



whenever the gains lie above the 45° line, or the combination of areas *B*, *C*, and *D*. The area in which the family wants to move, therefore, does not coincide with the areas indicating what each person in the family would do if he or she were single. In other words,

the optimal decision for the family is not necessarily the same as the optimal choice for a single person.

Tied Stayers and Tied Movers

To see why the family's incentives to migrate differ from the private incentives of each family member, consider any point in area *E*. In this area, the wife would move on her own if she were single, for there are private gains to her move (that is, $\Delta PV_W > 0$). Note, however, that the husband's loss exceeds her gain (so that $\Delta PV_H + \Delta PV_W < 0$), and hence it is not optimal for the family to move. The wife is, in effect, a **tied stayer**. She sacrifices the better employment opportunities available elsewhere because her husband is much better off in their current region of residence.

Similarly, consider any point in area *D*. In this area, the husband experiences an income loss if he moves on his own (that is, $\Delta PV_H < 0$). Nevertheless, when he moves as part of a family unit, the wife's gain exceeds the husband's loss, so that $\Delta PV_H + \Delta PV_W > 0$. The family moves and the husband is a **tied mover**. He follows the wife even though his employment outlook is better at their current residence.

The analysis of family migration decisions shows that all persons in the family need not have positive private gains from migration. A comparison of the premigration and postmigration earnings of tied movers would indicate that they "lost" from the migration. In fact, the evidence suggests that the postmigration earnings of women are often lower than their premigration earnings. The wage cut is often substantial, sometimes on the order of \$1,000 per year.²⁰

We have seen, however, that the premigration and postmigration comparison of wives' earnings does not necessarily imply that migration is a bad investment. The family as a whole gained, so that both parties in the household are better off.

The rapid rise in the female labor force participation rate implies that *both* husbands and wives increasingly find themselves in situations in which their private incentives to migrate do not coincide with the family's incentives. Because both spouses are often looking for work in the same city and sometimes even in the same narrowly defined profession, the chances of finding adequate jobs for the two parties are slim, reducing the likelihood that the family will move.

The increase in the number of two-worker households has given rise to creative labor market arrangements. Employers interested in hiring one of the spouses facilitate the job search process for the other and sometimes even hire both. There also has been an increase in the number of married couples who maintain separate households in different cities, so as to minimize the financial losses of being tied movers or tied stayers. Finally, the conflict between the migration decision that is best for a single person and the migration decision that is best for the family makes the household unit more unstable. We do not know, however, to what extent divorce rates are driven by the refusal of tied movers and tied stayers to go along with the family's migration decision.

²⁰ Sandell, "Women and the Economics of Family Migration"; see also Paul J. Boyle et al., "A Cross-National Comparison of the Impact of Family Migration on Women's Employment Status," *Demography* 38 (May 2001): 201–13; and Satu Nivalainen, "Determinants of Family Migration: Short Moves vs. Long Moves," *Journal of Population Economics* 17 (February 2004): 157–75.

Theory at Work

POWER COUPLES

There are an increasing number of “power couples” in the United States, couples in which both spouses are college graduates. The proportion of power couples rose from 2 percent in 1940, to 9 percent in 1970, and to 15 percent in 1990. Because highly educated women are more likely to participate in the labor force, power couples are predominantly dual-career couples. In 1940, the probability that the wife in a power couple worked was 20.1 percent; this statistic rose to 73.3 percent by 1990.

Because both spouses in a power couple tend to work, it may be difficult for both spouses to obtain their “optimal” jobs in the same geographic labor market. As a result, power couples may have to split and reside in different cities, or one of the spouses in a power couple will have to accept the fact that he or she is a tied stayer (or a tied mover) and work at a job that does not provide the best employment opportunities.

Power couples can minimize these problems by settling in those parts of the country that are likely to provide many employment opportunities for high-skill workers, such as large metropolitan areas. The diversified labor markets in these large cities have the potential to provide satisfactory job matches for both spouses. It

turns out that this is precisely what power couples have done in the past few decades. Table 9-1 summarizes the evidence.

The proportion of power couples settling in a large metropolitan area rose from 14.6 to 34.8 percent between 1970 and 1990. In contrast, the similar proportion for couples in which neither spouse is a college graduate (or a “low-power couple”) rose only from 8.3 to 20.0 percent. If we treat the locational choice made by the low-power couples as the choice of a control group, the difference-in-differences approach implies that being in a power couple increases the probability of residing in a large metropolitan area by 8.5 percentage points. Many power couples, therefore, chose to reduce the cost associated with being a power couple by moving to different parts of the country.

Source: Dora L. Costa and Matthew E. Kahn, “Power Couples: Changes in the Locational Choice of the College Educated, 1940–1990,” *Quarterly Journal of Economics* 115 (November 2000): 1287–314; see also Janice Compton and Robert A. Polak, “Why Are Power Couples Increasingly Concentrated in Large Metropolitan Areas,” National Bureau of Economic Research Working Paper No. 19918, November 2004.

TABLE 9-1 Percent of Couples with Working Wives That Reside in a Large Metropolitan Area

	1970	1990	Difference
Power couples	14.6	34.8	20.2
Low-power couples	8.3	20.0	11.7
Difference-in-differences	—	—	8.5

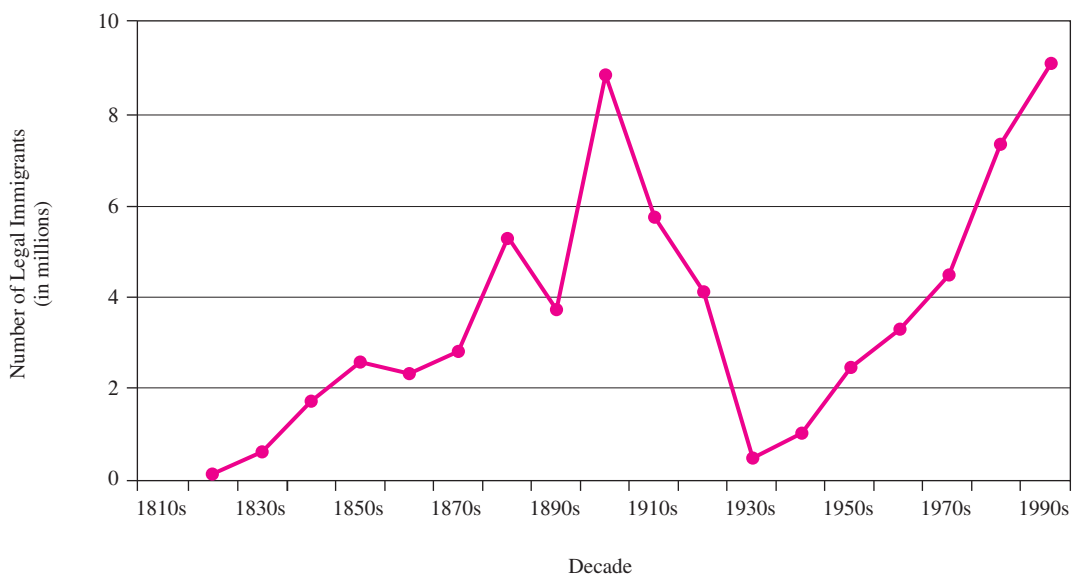
9-4 Immigration in the United States

There has been a resurgence of large-scale immigration in the United States and in many other developed countries. The United Nations estimates that around 190 million people, or almost 3 percent of the world’s population, now reside in a country where they were not born.²¹

²¹ United Nations Population Division, Department of Economics and Social Affairs, *International Migration, 2006*, New York: United Nations, 2006, www.un.org/esa/population/publications/2006Migration_Chart/2006IttMig_chart.htm.

FIGURE 9-3 Legal Immigration to the United States by Decade, 1820–2000

Source: U.S. Immigration and Naturalization Service, *Statistical Yearbook of the Immigration and Naturalization Service, 2000*. Washington, DC: Government Printing Office, 2000, p. 18.



We begin our study of this important population flow by providing a brief history of immigration in the country that receives the largest immigrant flow—the United States.²² As Figure 9-3 shows, the size of the immigrant flow reaching the United States has fluctuated dramatically in the past century. Reacting to the large number of immigrants who entered the country at the beginning of the twentieth century, Congress closed the floodgates in the 1920s by enacting the national-origins quota system, which limited the number of immigrants as well as granted most of the available visas to persons born in northwestern European countries.

During the entire 1930s, only 500,000 immigrants entered the United States. Since then, the number of legal immigrants has increased substantially and is now at historic levels. In 2004, almost 1 million persons were admitted legally. There also has been a steady increase in the number of illegal immigrants. It is estimated that around 10.5 million persons were present illegally in the United States in January 2005 and that the *net* flow of illegal immigrants is at least 400,000 persons per year.²³

The huge increase in immigration in recent decades can be attributed partly to changes in U.S. immigration policy. The 1965 amendments to the Immigration and Nationality Act (and subsequent revisions) repealed the national-origins quota system, increased the number

²² For a more detailed discussion, see George J. Borjas, *Heaven's Door: Immigration Policy and the American Economy*, Princeton, NJ: Princeton University Press, 1999.

²³ U.S. Immigration and Naturalization Service, "Estimates of the Unauthorized Immigrant Population Residing in the United States, January 2005," August 2006, www.dhs.gov/xlibrary/assets/statistics/publications/ILL_PE_2005.pdf.

of available visas, and made family ties to U.S. residents the key factor that determines whether an applicant is admitted into the country. As a consequence of both the 1965 amendments and major changes in economic and political conditions in the source countries, the national-origin mix of the immigrant flow has changed substantially in the past few decades. Over two-thirds of the legal immigrants admitted during the 1950s originated in Europe or Canada, 25 percent originated in Latin America, and only 6 percent originated in Asia. By the 1990s, only 17 percent of the immigrants originated in Europe or Canada, 47 percent originated in Latin America, and an additional 31 percent originated in Asia.

An important factor that motivates these migration flows is the sizable income difference that exists between the United States and the source countries. A recent study of Mexican illegal immigration shows that the flow of illegal immigrants is extremely responsive to changes in economic conditions in the two countries.²⁴ In a typical month between 1968 and 1996, the Border Patrol apprehended 42,890 persons at the Mexican border attempting to enter the country illegally. The elasticity of the number of apprehensions with respect to the wage in the Mexican labor market is around -0.8 ; a 10 percent reduction in the Mexican wage increases the number of apprehensions by around 8 percent. Similarly, the elasticity of border apprehensions with respect to the wage in the U.S. labor market is around $+1$; a 10 percent increase in the U.S. wage increases the number of apprehensions by 10 percent. Moreover, the number of apprehensions responds almost immediately—within one month—to a change in the Mexican wage or the U.S. wage. Put differently, there seems to be a large pool of potential illegal immigrants in Mexico who are ready to almost instantaneously pack up and move at the slightest change in economic conditions.

9-5 Immigrant Performance in the U.S. Labor Market

How do immigrants do in the U.S. labor market? This question plays a crucial role in the debate over immigration policy, not only in the United States but in other receiving countries as well. Immigrants who can adapt well and are relatively successful in their new jobs can make a significant contribution to economic growth. Moreover, natives need not be concerned about the possibility that these immigrants will enroll in public assistance programs and become a tax burden. In short, the economic impact of immigration will depend on the skill composition of the immigrant population.

The Age-Earnings Profiles of Immigrants and Natives in the Cross Section

To assess the relationship between immigrant economic performance and the process of assimilation, many early studies used *cross-section* data sets (that is, data sets that give a snapshot of the population at a point in time, such as a particular U.S. census) to trace out the age-earnings profiles of immigrants and natives.²⁵ A cross-section data set lets us

²⁴ Gordon Hanson and Antonio Spilimbergo, "Illegal Immigration, Border Enforcement, and Relative Wages," *American Economic Review* 89 (December 1999): 1337–57.

²⁵ Barry R. Chiswick, "The Effect of Americanization on the Earnings of Foreign-Born Men," *Journal of Political Economy* 86 (October 1978): 897–921; and Geoffrey Carliner, "Wages, Earnings, and Hours of Work of First, Second, and Third Generation American Males," *Economic Inquiry* 18 (January 1980): 87–102.

compare the *current* (that is, as of the time the snapshot is taken) earnings of newly arrived immigrants with the *current* earnings of immigrants who migrated years ago. Figure 9-4 uses data from the 1970 census to illustrate the typical age-earnings profiles for immigrants and natives. At the time of entry into the United States (at age 20 in the figure), the wages of immigrant men are about 15 percent lower than the wages of comparable native men. The age-earnings profile of immigrants, however, is much steeper. In fact, after 14 years in the United States, the earnings of immigrants seem to “overtake” the earnings of native-born workers. The typical immigrant who has been in the United States for 30 years earns about 10 percent more than comparable natives. The cross-section data thus suggest that upward mobility is an important aspect of the immigrant experience because immigrants who arrived many years ago earn much more than newly arrived immigrants.

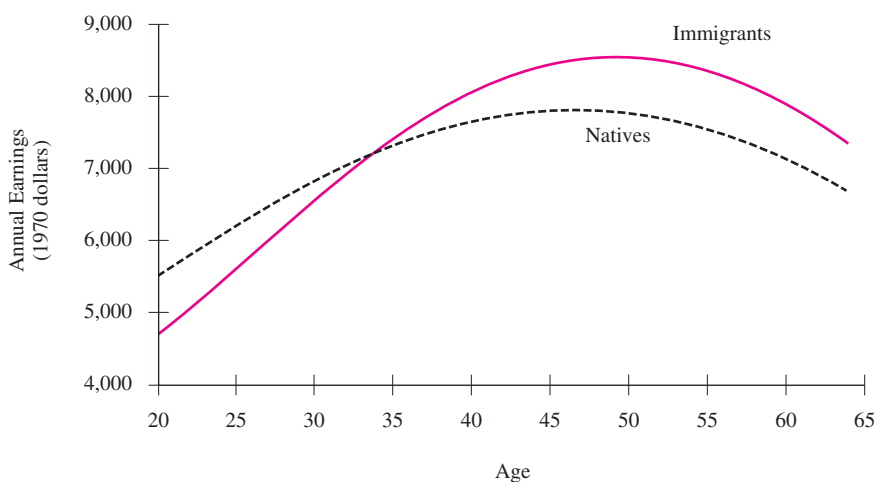
There are three distinct results in Figure 9-4 that are worth discussing in detail. First, note that immigrant earnings are initially below the earnings of natives. This finding is typically interpreted as follows: When immigrants first arrive in the United States, they lack many of the skills that are valued by American employers. These “U.S.-specific” skills include language, educational credentials, and information on what the best-paying jobs are and where they are located.

The second result is that the immigrant age-earnings profile is steeper than the native age-earnings profile. As we saw in Chapter 7, the human capital model implies that greater volumes of human capital investment steepen the age-earnings profile. As immigrants learn English and learn about the U.S. labor market, the immigrants’ human capital stock grows relative to that of natives, and economic assimilation occurs in the sense that immigrant earnings begin to converge to the earnings of natives.

The human capital model thus provides a reasonable story of why immigrant earnings start out below and grow faster than the earnings of natives. This story, however, cannot account for the third finding in the figure: After 14 years in the United States, immigrants seem to earn more than natives. After all, why should immigrants end up accumulating more human capital than natives?

FIGURE 9-4
The Age-Earnings Profiles of Immigrant and Native Men in the Cross Section

Source: Barry R. Chiswick, “The Effect of Americanization on the Earnings of Foreign-Born Men,” *Journal of Political Economy* 86 (October 1978): Table 2, Column 3.



To explain why immigrants eventually earn more than natives, some researchers resort to a selection argument: Some workers in the source countries choose to migrate and others choose to stay, and immigrants are not randomly selected from the population of the countries of origin. It seems plausible to argue that only the persons who have exceptional ability, or a lot of drive and motivation, would pack up everything they own, leave family and friends behind, and move to a foreign country to start life anew. If immigrants are indeed selected from the population in this manner, it would not be surprising to find that immigrants are more productive than natives (and earn more) once they acquire the necessary U.S.-specific skills.

Assimilation and Cohort Effects

The bottom line of the cross-section data summarized in Figure 9-4 is that immigrants who migrated many years ago earn more than newly arrived immigrants. The “assimilationist” interpretation of this result would say that those who migrated many years ago have acquired U.S.-specific skills. In time, the new arrivals will also acquire these skills and will be just as successful as the older waves of immigrants.

The basic problem with this interpretation of the cross-sectional evidence is that we are drawing inferences about how the earnings of immigrant workers evolve over time from a single snapshot of the immigrant population. It might be the case, for example, that newly arrived immigrants are inherently different from those who migrated 20 years ago. Hence, it is invalid to use the economic experience of those who migrated 20 years ago to forecast the future labor market performance of current immigrants. Figure 9-5 illustrates the logic behind this alternative hypothesis.²⁶

To simplify, let’s consider a hypothetical situation where there are three separate immigrant waves, and these waves have distinct productivities. One wave arrived in 1960, the second arrived in 1980, and the last arrived in 2000. Suppose also that all immigrants enter the United States at age 20.

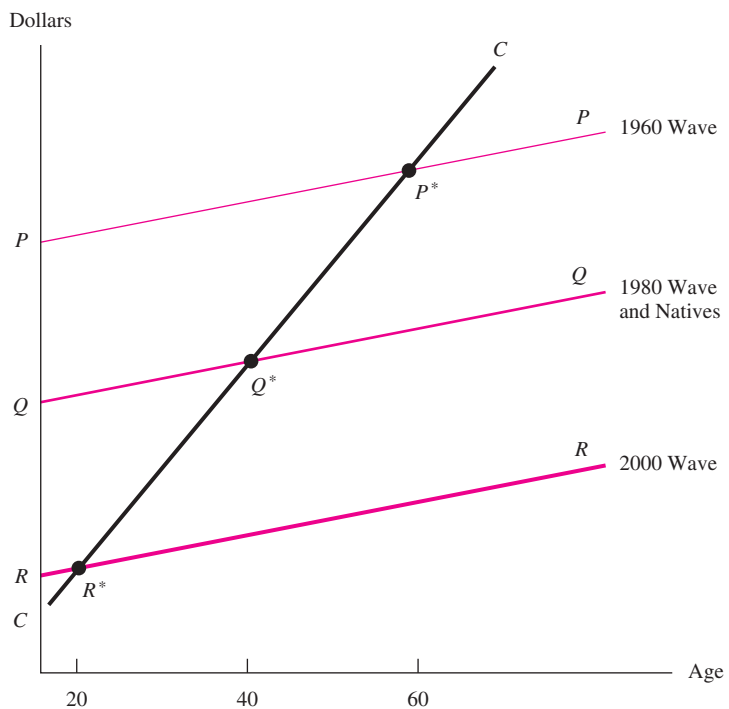
Let’s also assume that the earliest cohort has the highest productivity level of any group in the population, including U.S.-born workers. If we could observe their earnings in every year after they arrive in the United States, their age-earnings profile would be given by the line *PP* in Figure 9-5. For the sake of argument, let’s assume that the last wave of immigrants (that is, the 2000 arrivals) is the least productive of any group in the population, including natives. If we could observe their earnings throughout their working lives, their age-earnings profile would be given by the line *RR* in the figure. Finally, suppose that the immigrants who arrived in 1980 have the same skills as natives. If we could observe their earnings at every age in their working lives, the age-earnings profiles of this cohort and of natives would be given by the line *QQ*. Note that the age-earnings profiles of each of the immigrant cohorts is parallel to the age-earnings profile of the native population. There is *no* wage convergence between immigrants and natives in our hypothetical example.

Suppose we now have access to data drawn from the 2000 decennial census. This cross-section data set, which provides a snapshot of the U.S. population as of April 1, 2000, provides information on each worker’s wage rate, age, whether native or foreign born, and the year the worker arrived in the United States. As a result, we can observe the wage of immigrants who

²⁶ George J. Borjas, “Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants,” *Journal of Labor Economics* 3 (October 1985): 463–89.

FIGURE 9-5 Cohort Effects and the Immigrant Age-Earnings Profile

The typical person migrating in 1960 is skilled and has age-earnings profile PP ; the 2000 immigrant is unskilled and has age-earnings profile RR ; the 1980 immigrant has the same skills as the typical native and has age-earnings profile QQ . Suppose all immigrants arrive at age 20. The 2000 census cross section reports the wages of immigrants who have just arrived (point R^*); the wage of immigrants who arrived in 1980 when they are 40 years old (point Q^*); and the wage of immigrants who arrived in 1960 when they are 60 years old (point P^*). The cross-sectional age-earnings profile erroneously suggests that immigrant earnings grow faster than those of natives.



have just arrived as part of the 2000 cohort when they are 20 years old (see point R^* in the figure). We also can observe the wage of immigrants who arrived in 1980 when they are 40 years old (point Q^*), and we observe the wage of immigrants who arrived in 1960 when they are 60 years old (point P^*). A cross-section data set, therefore, allows us to observe only one point on each of the immigrant age-earnings profiles.

If we connect points P^* , Q^* , and R^* , we trace out the immigrant age-earnings profile that is generated by the cross-sectional data, or line CC in Figure 9-5. This cross-section line has two important properties. First, it is substantially steeper than the native age-earnings profile. The tracing out of the age-earnings profile of immigrants using cross-section data makes it seem as if there is wage convergence between immigrants and natives, when in fact there is none. Second, the cross-section line CC crosses the native line at age 40. This gives the appearance that immigrant earnings overtake those of natives after they have been in the United States for 20 years. In fact, no immigrant group experienced such an overtaking.

Figure 9-5 illustrates how the cross-sectional age-earnings profile can yield an erroneous perception about the adaptation process experienced by immigrants if there are intrinsic

differences in productivity across immigrant cohorts. These differences in skills across cohorts are called **cohort effects**.

The hypothetical example illustrated in the figure assumed that more recent immigrant cohorts are less skilled than earlier cohorts. This type of cohort effect can arise if changes in U.S. immigration policy deemphasize skills as a condition of admission. The cohort effects also can arise because of nonrandom return migration by immigrants. Perhaps one-third of all immigrants eventually leave the United States, presumably to return to their countries of origin.²⁷ Suppose that immigrants who have relatively low earnings in the United States are the ones who make the return trip. In any given cross section, earlier immigrant waves have been filtered out and the survivors have high earnings, whereas more recent waves have yet to be filtered and their average earnings are dragged down by the presence of future emigrants. This process of return migration generates a positive correlation between earnings and years since migration in the cross section, but this correlation says nothing about economic assimilation.

Evidence on Cohort Effects and Immigrant Assimilation

The data suggest that there are skill differentials across immigrant cohorts and that these cohort effects are quite large.²⁸ Figure 9-6 illustrates the trend in the entry wage gap between immigrants and natives across successive immigrant waves between 1960 and 1990. Newly arrived immigrants in 1960 earned about 11 percent less than natives. By 1990, the newest immigrant arrivals earned about 37 percent less than natives. Interestingly, there was a slight turnaround in the 1990s, and by 2000 newly arrived immigrants earned about 31 percent less than natives.²⁹

To determine if the earnings of a specific immigrant cohort reach parity with those of natives, a number of studies “track” the earnings of the cohort across censuses. For instance, the 1980 census reports the average wage of persons who migrated in 1980 when

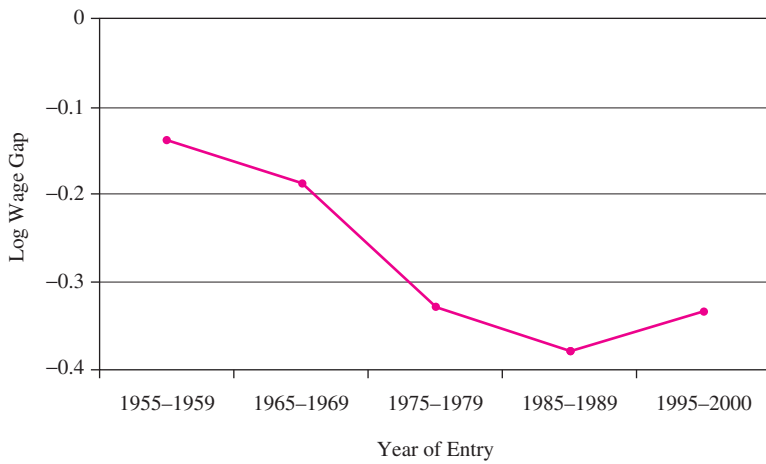
²⁷ Robert Warren and Jennifer Marks Peck, “Foreign-Born Emigration from the United States: 1960 to 1970,” *Demography* 17 (February 1980): 71–84; and George J. Borjas and Bernt Bratsberg, “Who Leaves? The Outmigration of the Foreign-Born,” *Review of Economics and Statistics* 78 (February 1996): 165–76.

²⁸ The evidence is surveyed by George J. Borjas, “The Economic Analysis of Immigration,” in Orley C. Ashenfelter and David Card, editors, *Handbook of Labor Economics*, vol. 3A, Amsterdam: Elsevier, 1999, pp. 1697–760. The tracking of immigrant cohorts across cross sections also is affected by the existence of “period effects,” the impact of macroeconomic changes on the wage structure (due either to inflation or to cyclical fluctuations). These period effects might have a different impact on native and on immigrant wages; see Robert J. LaLonde and Robert H. Topel, “The Assimilation of Immigrants in the U.S. Economy,” 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. 67–92; and George J. Borjas, “Assimilation and Changes in Cohort Quality Revisited: What Happened to Immigrant Earnings in the 1980s?” *Journal of Labor Economics* 13 (April 1995): 201–45.

²⁹ The earnings turnaround of the 1990s was partly due to changes in immigration policy, including the very large increase in the number of high-tech workers admitted as part of the H1-B visa program; see George J. Borjas and Rachel Friedberg, “The Immigrant Earnings Turnaround of the 1990s,” Working Paper, Harvard University and Brown University, July 2006; see also Linnea Polgreen and Nicole B. Simpson, “Recent Trends in the Skill Composition of Legal U.S. Immigrants,” *Southern Economic Journal* 72 (April 2006): 938–57.

FIGURE 9-6
The Wage Differential between Immigrant and Native Men at Time of Entry

Source: George J. Borjas and Rachel Friedberg, "The Immigrant Earnings Turnaround of the 1990s," Working Paper, Harvard University and Brown University, July 2006.



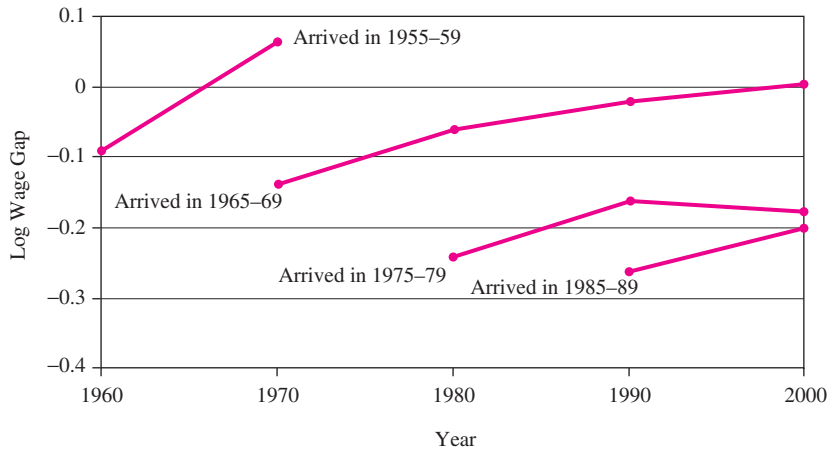
they are 25 years old; the 1990 census reports the average wage of the same immigrants when they are 35 years old; and the 2000 census reports the average wage for the same persons when they are 45 years old. The tracking of specific immigrant cohorts across censuses, therefore, traces out the age-earnings profile for each of the cohorts.

Figure 9-7 illustrates the evidence provided by this type of tracking analysis. The immigrant waves that arrived before 1970 started with a slight wage disadvantage and either

FIGURE 9-7 Evolution of Wages for Specific Immigrant Cohorts over the Life Cycle (Relative to Wages of Comparably Aged Native Men)

Source: George J. Borjas and Rachel Friedberg, "The Immigrant Earnings Turnaround of the 1990s," Working Paper, Harvard University and Brown University, July 2006.

Relative Wage of Immigrants Who Arrived When They Were 25-34 Years Old



caught up with or surpassed the earnings of native workers within one or two decades. The cohorts that arrived in the 1970s or 1980s, however, start out at a much greater disadvantage, making it unlikely that they will catch up with comparably aged native workers during their working lives.³⁰

9-6 The Decision to Immigrate

A number of studies have tried to identify the factors responsible for the decline in relative skills across immigrant waves.³¹ Some of the studies have pointed to a single culprit: the changing national-origin mix of the immigrant flow. As noted earlier, post-1965 immigrants are much more likely to originate in Latin American and Asian countries. Table 9-2 documents a lot of variation in the relative wage of immigrants across national-origin groups. Immigrants from the United Kingdom earn 37 percent more than natives, whereas those from Mexico earn 40 percent less.

Two factors account for the dispersion in relative wages across national-origin groups. First, skills acquired in advanced, industrialized economies are more easily transferable to the American labor market. After all, the industrial structure of advanced economies and

TABLE 9-2
Wages of
Immigrant
Men in 1990,
by Country of
Birth

Source: George J. Borjas, "The Economics of Immigration," *Journal of Economic Literature* 32 (December 1994): 1686.

Country of Birth:	Percent Wage Differential between Immigrants and Natives
Europe	
Germany	24.5
Portugal	-3.1
United Kingdom	37.2
Asia	
India	17.6
Korea	-12.0
Vietnam	-18.9
Americas	
Canada	24.0
Dominican Republic	-29.2
Mexico	-39.5
Africa	
Egypt	12.2
Ethiopia	-21.0
Nigeria	-18.9

³⁰ An interesting study of the factors that contribute to immigrant assimilation in the Swedish context is given by Per-Anders Edin, Peter Fredriksson, and Olof Aslund, "Settlement Policies and the Economic Success of Immigrants," *Journal of Population Economics* 17 (February 2004): 133-55.

³¹ George J. Borjas, "Self-Selection and the Earnings of Immigrants," *American Economic Review* 77 (September 1987): 531-53; and LaLonde and Topel, "The Assimilation of Immigrants in the U.S. Economy."

the types of skills rewarded by firms in those labor markets greatly resemble the industrial structure of the United States and the types of skills rewarded by American employers. In contrast, the industrial structure of less-developed countries probably rewards skills that are less useful in the American labor market. The human capital embodied in residents of those countries is, to some extent, specific to those countries and cannot be easily transferred to the United States.

There is, in fact, a strong positive correlation between the earnings of an immigrant group in the United States and per capita GDP in the country of origin; a doubling of the source country's per capita GDP may increase the U.S. earnings of an immigrant group by as much as 4 percent.³² Because more recent immigrant waves tend to originate in low-income countries, they will be somewhat less successful in the U.S. labor market.

The Roy Model

There also will be dispersion in skills among national-origin groups in the United States because different types of immigrants come from different countries. Which subset of workers in a given source country finds it worthwhile to migrate to the United States: the most skilled or the least skilled?

Consider workers residing in a country that offers a low rate of return to a worker's human capital so that the skilled do not earn much more than the unskilled. This is typical in countries such as Sweden that have relatively egalitarian income distributions and almost confiscatory income tax systems. Relative to the United States, these countries tax able workers and insure the unskilled against poor labor market outcomes. This situation generates incentives for the skilled to migrate to the United States because they have the most to gain by moving. Put differently, the United States is the recipient of a "brain drain."

Consider instead workers originating in source countries that offer a high rate of return to human capital. This is typical in countries with substantial income inequality, as in many less-developed countries. In this situation, it is the United States that taxes the skilled and subsidizes the unskilled (relative to the source country). The United States thus becomes a magnet for workers with relatively low earnings capacities.

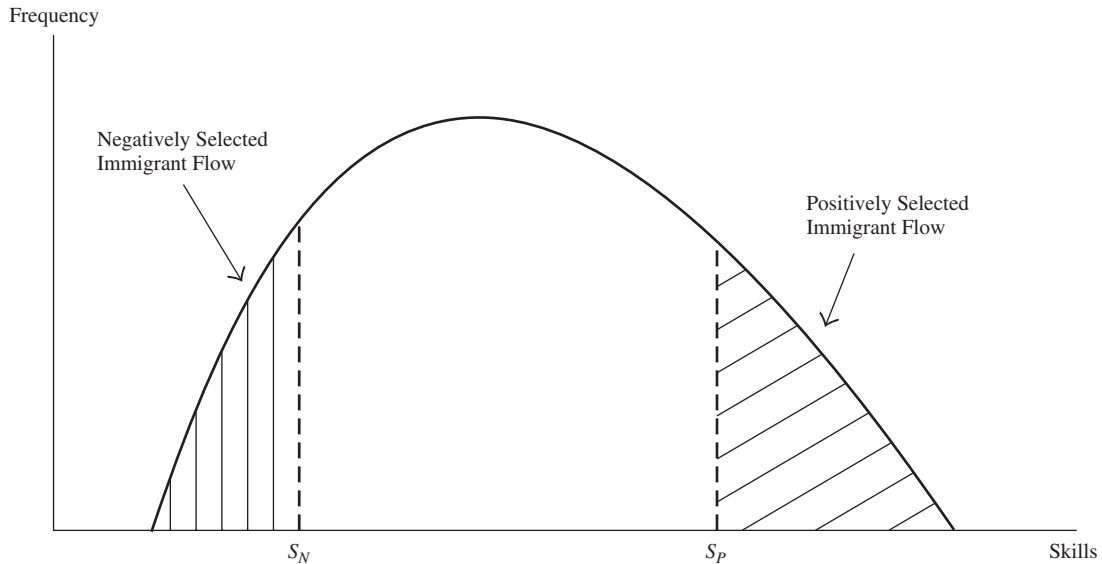
The economic intuition underlying these arguments is based on the influential **Roy model**, which describes how workers sort themselves among employment opportunities.³³ The key insights of the Roy model can be derived easily. Suppose that persons currently residing in the source country are trying to decide if they should migrate to the United States. We assume that earnings in both the source country and the United States depend on a single factor—skills—that is completely transferable across countries. Let the variable s denote the number of efficiency units embodied in the worker. The frequency distribution of skills in the source country's population is illustrated in Figure 9-8. We wish to determine which subset of workers chooses to migrate to the United States.

³² Guillermina Jasso and Mark R. Rosenzweig, "What's in a Name? Country-of-Origin Influences on the Earnings of Immigrants in the United States," *Research in Human Capital and Development* 4 (1986): 75–106.

³³ Andrew D. Roy, "Some Thoughts on the Distribution of Earnings," *Oxford Economic Papers* 3 (June 1951): 135–46. The model was applied to the migration decision by Borjas, "Self-Selection and the Earnings of Immigrants."

FIGURE 9-8 The Distribution of Skills in the Source Country

The distribution of skills in the source country gives the frequency of workers in each skill level. If immigrants have above-average skills, the immigrant flow is positively selected. If immigrants have below-average skills, the immigrant flow is negatively selected.



Each worker makes his or her migration decision by comparing earnings in the source country and in the United States. Figure 9-9 illustrates the relation between wages and skills for each of the countries. The slope of these wage-skill lines gives the dollar payoff to an additional efficiency unit in the United States or in the source country. In Figure 9-9*a*, the wage-skill line is steeper in the United States, so the payoff to an efficiency unit of human capital is higher in the United States than in the source country. In Figure 9-9*b*, the wage-skill line is steeper in the source country, so the payoff to skills is higher in the source country. To easily illustrate how the migration decision is reached, let's assume initially that workers do not incur any costs when they move to the United States. The decision rule that determines immigration is then quite simple: A worker migrates to the United States whenever U.S. earnings exceed earnings in the source country.³⁴

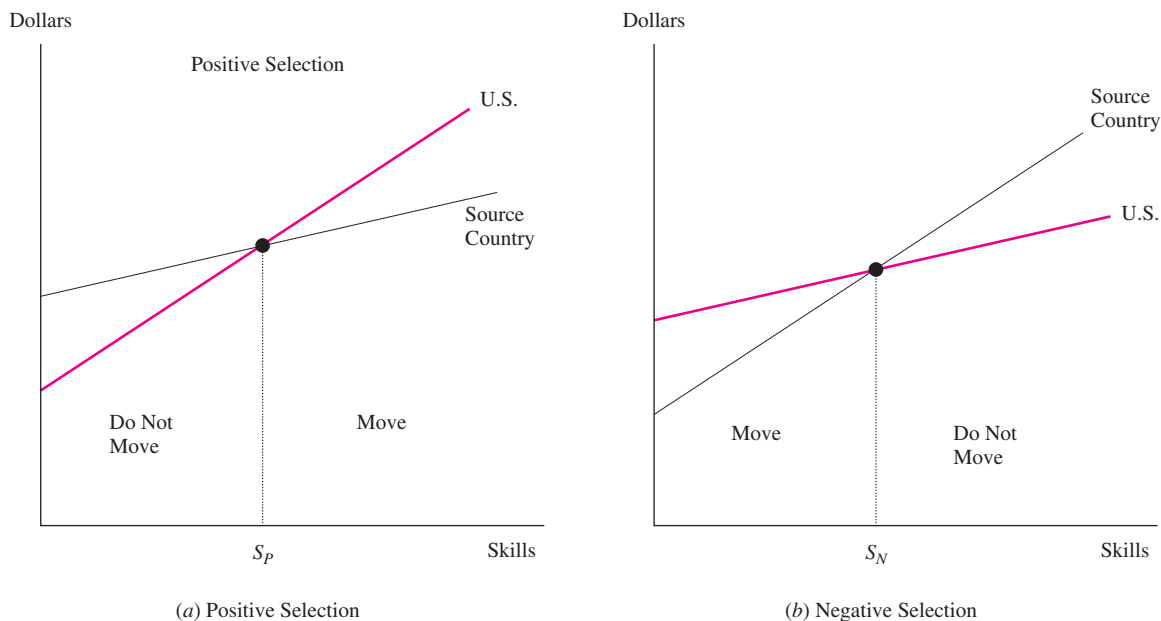
Consider first the sorting that occurs in Figure 9-9*a*. Workers with fewer than s_p efficiency units earn more if they stay in the source country than if they migrate to the United States. Workers with more than s_p efficiency units, however, earn more in the United States than in the source country. Hence, workers with relatively high skill levels migrate to the United States.

As long as the payoff for skills in the United States exceeds the payoff for skills in the source country, all persons who have a skill level exceeding the threshold s_p are better off in

³⁴ Note that the model is also implicitly assuming that immigration policy does not restrict the entry of any immigrants who find it worthwhile to move to the United States.

FIGURE 9-9 The Self-Selection of the Immigrant Flow

(a) If the rate of return to skills is higher in the United States than in the source country (so that the wage-skills line is steeper in the United States), the immigrant flow is positively selected. Workers with more than s_P efficiency units find it profitable to migrate to the United States. (b) If the rate of return to skills is lower in the United States, the immigrant flow is negatively selected. Workers with fewer than s_N efficiency units emigrate.



the United States. Therefore, the migration flow is composed of workers in the upper tail of the skill distribution illustrated in Figure 9-8. This type of self-selection is called **positive selection**. Immigrants, on average, are very skilled and do quite well in the United States.

Consider now Figure 9-9b, where the payoff for skills in the source country exceeds the payoff in the United States. Workers with fewer than s_N efficiency units earn more in the United States and will want to move. In contrast, workers who have more than s_N efficiency units have higher earnings in the source country and will not emigrate. When the payoff for skills in the United States is relatively low, therefore, the immigrant flow will be composed of the least-skilled workers in the source country. This type of self-selection is called **negative selection**. Immigrants, on average, are unskilled and perform poorly in the United States.

The key implication of the Roy model is clear: *The relative payoff for skills across countries determines the skill composition of the immigrant flow.* If an efficiency unit of human capital is highly valued in the United States, immigrants will originate in the upper tail of the skill distribution and will have higher-than-average skills. In contrast, if the source country offers a higher payoff, the immigrant flow contains workers from the lower tail of the skill distribution, who will have lower-than-average skills. Workers “selling” their skills behave just like firms selling their products. Both workers and goods flow to those markets where they can get the highest price.

The Roy model implies that immigrants who originate in countries that offer a low rate of return to human capital will earn more than immigrants who originate in countries that

Theory at Work

VISAS AVAILABLE (IF YOU PASS A TEST OR PAY UP!)

In the early 1990s, Canada had an annual immigrant flow on the order of 1 percent of its population. Since the mid-1960s, Canadian immigration policy has used a *point system* to allocate many of its available visas. Points are awarded according to the applicant's education (up to 25 points), language proficiency in either English or French (24 points), work experience (21 points), age (10 points), arranged employment (10 points), and other factors. In 2003, an applicant needed to obtain 75 out of 100 points to be awarded an entry visa.

The point system has a striking impact on the skill composition of immigrants entering Canada relative to the skill composition of U.S. immigrants. The typical immigrant who entered Canada in the early 1960s (prior to the enactment of the point system) had less schooling than the typical immigrant who entered the United States at the same time (10.5 years of education versus 11 years). By the late 1970s, however, the situation had reversed. The typical immigrant admitted by Canada had far more schooling (12.6 years) than the typical immigrant entering the United States (11.9 years).

Canada also has sold visas in the open market. In particular, persons who are willing to invest about \$1 million in a Canadian business are permitted to immigrate. This

policy has attracted a large number of wealthy persons from many source countries, particularly investors from Hong Kong who bought "insurance" prior to the 1997 transfer of that colony to the People's Republic of China. Both the point system and the visas-for-sale components of Canadian immigration policy, therefore, can be interpreted as attempts to ensure that the immigrant flow is positively selected.

The United States also has entered the business of selling visas. The country allocates up to 10,000 entry visas annually for wealthy foreign investors who create at least 10 full-time jobs in the United States by investing \$1 million. The "purchase price" is reduced to \$500,000 if the investment is made in a high unemployment area. It seems, however, that the United States charges too much for a visa; in 2000, only 226 such visas were sold.

Sources: George J. Borjas, "Immigration Policy, National Origin, and Immigrant Skills: A Comparison of Canada and the United States," in David Card and Richard B. Freeman, editors, *Small Differences That Matter*, Chicago: University of Chicago Press, 1993, pp. 21–43; and Michael Baker and Dwayne Benjamin, "The Performance of Immigrants in the Canadian Labor Market," *Journal of Labor Economics* 12 (July 1994): 369–405.

offer a higher rate of return. The available evidence indeed indicates that there may be a negative correlation between measures of the source country's income inequality (which proxies for the rate of return to skills) and the earnings of immigrants in the United States.³⁵ The income distribution in Mexico, for instance, has about three times more dispersion than the income distribution in the United Kingdom. As a result, part of the sizable wage differential between a Mexican and a British immigrant arises because different types of persons choose to emigrate from these two countries.

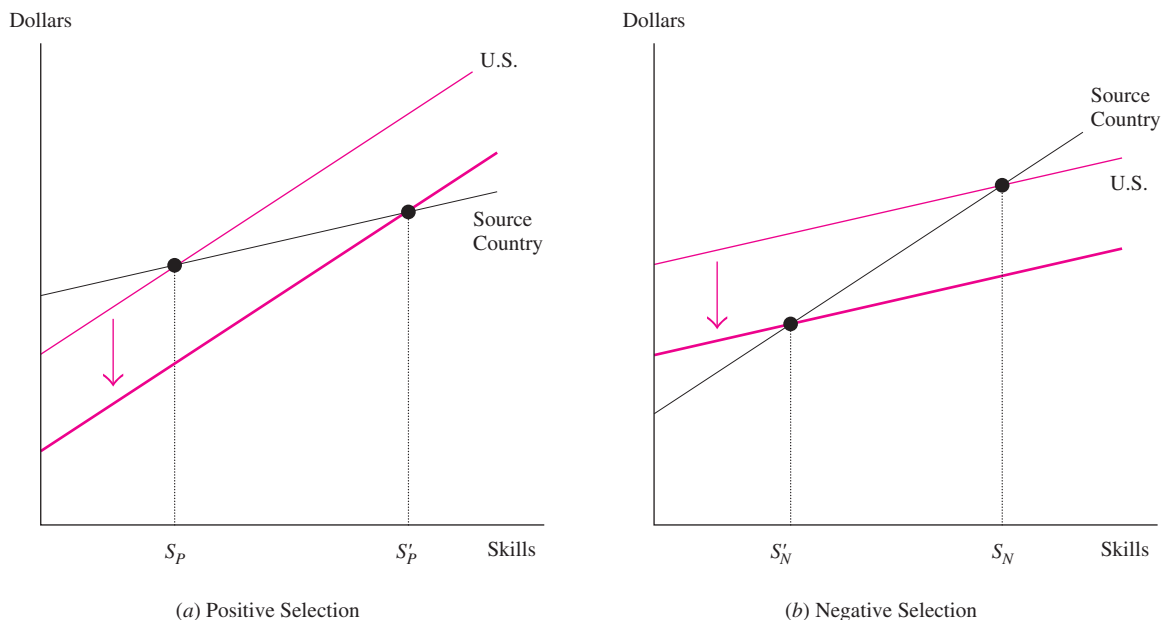
Changes in Income Levels and Migration Costs

A surprising implication of the Roy model is that the "base level" of income in the source country or in the United States (as measured by the height of the wage-skills lines in Figure 9-9) do not determine the type of selection that generates the immigrant flow. Changes in these base income levels, however, do affect the *size* of the flow.

³⁵ Borjas, "Self-Selection and the Earnings of Immigrants"; and Deborah Cobb-Clark, "Immigrant Selectivity and Wages: The Evidence for Women," *American Economic Review* 83 (September 1993): 986–93.

FIGURE 9-10 The Impact of a Decline in U.S. Incomes

If incomes in the United States fall (or if there is an increase in migration costs), the wage-skills line for the United States shifts down and fewer workers migrate. The decline in U.S. incomes, however, does not change the type of selection that characterizes the immigrant flow.



Suppose, for instance, that income levels in the United States fall because of a severe recession. The recession pushes down the wage-skills line in the United States, as illustrated in Figure 9-10. If the payoff for skills in the United States exceeds the payoff in the source country, as in Figure 9-10a, the threshold level s_p increases to s'_p . This implies that fewer workers now find it optimal to migrate to the United States. It is still the case, however, that workers who are above the new threshold s'_p are the ones who find it optimal to migrate, and hence the immigrant flow is positively selected.

If the payoff for skills is higher in the source country, as illustrated in Figure 9-10b, the threshold level s_N falls to s'_N . Because only workers who have skill levels below the threshold level want to move, the drop in U.S. incomes again reduces the number of immigrants. The immigrant flow is still negatively selected because immigrants originate in the lower tail of the skill distribution.

We have derived our main conclusions using the simplifying assumption that the worker does not incur any costs when migrating to the United States. We can now easily introduce migration costs into our framework. To simplify, suppose that it costs, say, \$5,000 to migrate to the United States, *regardless* of the worker's skill level. Migration costs obviously reduce the net income the worker can expect to receive in the United States. Therefore, migration costs shift down the wage-skills line in the United States and are *equivalent* to the reduction in the U.S. income level that we illustrated in Figure 9-10. If migration costs are constant in the population, therefore, an increase in migration costs

reduces the number of immigrants, but does not alter the type of selection that generates the immigrant flow.³⁶

9.7 Policy Application: Intergenerational Mobility of Immigrants

It is widely believed that, on average, the socioeconomic performance of the children of immigrants far surpasses that of their parents.³⁷ This perception originated in early empirical studies that compared the earnings of various generations of workers in the United States at a particular point in time, such as the 1970 decennial census.³⁸ Table 9-3 summarizes the available evidence for three such cross-sections: 1940, 1970, and 2000.

Each of these cross-section data files allows the precise identification of two generations of Americans: the immigrant generation (i.e., persons born abroad) and the second generation (i.e., persons born in the United States who have at least one parent born abroad). The generation of the remaining persons in the sample (i.e., of persons who have American-born parents and were themselves born in the United States) cannot be determined exactly, but they are typically referred to as “third-generation” Americans. It should be noted, however, that this residual group contains persons who are grandchildren of immigrants as well as descendants of the Mayflower Pilgrims.

For each of the available cross-sections, Table 9-3 reports the (age-adjusted) log weekly wage of first- and second-generation male workers relative to that of the baseline third generation. In 1970, for example, immigrant men earned about 1.4 percent more than men in the third generation, while second-generation working men earned 14.6 percent more than the baseline workforce. In short, second-generation workers in 1970 earned more than both the immigrants and the subsequent generations.

In fact, Table 9-3 reveals the same empirical pattern for every single cross section of data. In 1940, second-generation working men earned 17.8 percent more than the baseline third

TABLE 9-3 Relative Wages of Men across Generations

Source: George J. Borjas, “Making It in America: The Immigrant Experience,” *The Future of Children* 16 (Fall 2006).

	1940	1970	2000
Age-adjusted log weekly wage, relative to 3rd generation			
1st generation	0.058	0.014	-0.197
2nd generation	0.178	0.146	0.063

³⁶ The predictions of the model are somewhat different if migration costs vary across workers who differ in their skills; see Daniel Chiquiar and Gordon Hanson, “International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States,” *Journal of Political Economy* 113 (April 2005): 239–81. Chiquiar and Hanson find that the probability of emigration to the United States is highest for Mexican workers in the middle of the Mexican skill distribution.

³⁷ The discussion in this section is based on George J. Borjas, “Making It in America: The Immigrant Experience,” *The Future of Children* 16 (Fall 2006): 57–71.

³⁸ Barry R. Chiswick, “Sons of Immigrants: Are They at an Earnings Disadvantage?” *American Economic Review* 67, no. 1 (1977): 376–80; and Carliner, “Wages, Earnings, and Hours of First, Second and Third Generation American Males.”

generation, while immigrants earned only 5.8 percent more. In 2000, second-generation working men earned 6.3 percent more than the baseline third generation, while immigrants earned 19.7 percent less.

The wage superiority of the second generation in each cross-section snapshot seems to imply that second-generation Americans earn more than both their parents and their children. A common story used to explain this inference is that the children of immigrants are “hungry” and have the drive and ambition that ensures economic success in the U.S. labor market—and that this hunger is lost once the immigrant household becomes fully Americanized by the third generation. If this interpretation were correct, the policy concern over the relatively low skill level of the immigrants who have migrated to the United States in the past three decades may be misplaced. If historical patterns were to hold in the future, the children of these immigrants will outperform not only their parents but the rest of the workforce as well in only a few decades.

However, the evidence summarized in Table 9-3 does not necessarily justify this inference. After all, the family ties among the three generations identifiable in any cross section of data are very tenuous. It is *biologically impossible* for most second-generation workers enumerated in a particular cross section to be the direct descendants of the immigrants enumerated at the same time. For instance, working-age immigrants enumerated in 2000 (most of whom arrived in the 1980s and 1990s) typically cannot have American-born children who are also of working age. Second-generation Americans of working age can only be the descendants of immigrants who have been in the country for at least two or three decades. Put differently, most of the second-generation workers enumerated in 2000 are unlikely to be the children of the immigrant workers enumerated at the same time.

As a result, the fact that second-generation workers earn more than other workers at a point in time does not necessarily imply that second-generation workers earn more than either their parents or their children. To calculate the improvement in economic status between the first and second generations, one must link the economic performance of parents and children, rather than compare the economic performance of workers belonging to different generations in a cross section.

It is possible to approximate the correct intergenerational comparison by tracking the immigrant population over time.³⁹ For instance, the 1970 census provides information on the economic performance of the immigrants present in the United States at that time. Many of these immigrants are, in fact, the parents of the second-generation workers enumerated in the 2000 cross section. Similarly, the 1940 census provides information on the economic performance of immigrants in 1940. These immigrants, in turn, are probably the parents of the second-generation workers enumerated by the 1970 census. It is only by comparing the economic performance of immigrant workers in 1940 with the economic performance of second-generation workers in 1970—or the economic performance of immigrant workers in 1970 with that of the second generation in 2000—that one can correctly determine the economic progress experienced by the children of immigrants.

Consider again the wage information summarized in Table 9-3. If we (incorrectly) used only the information provided by the 2000 cross section, we would conclude that since second-generation workers earn 6.3 percent more than the baseline third generation and first-generation workers earn 19.7 percent less than the baseline, second-generation workers earn

³⁹ George J. Borjas, “The Intergenerational Mobility of Immigrants,” *Journal of Labor Economics* 11 (January 1993): 113–35.

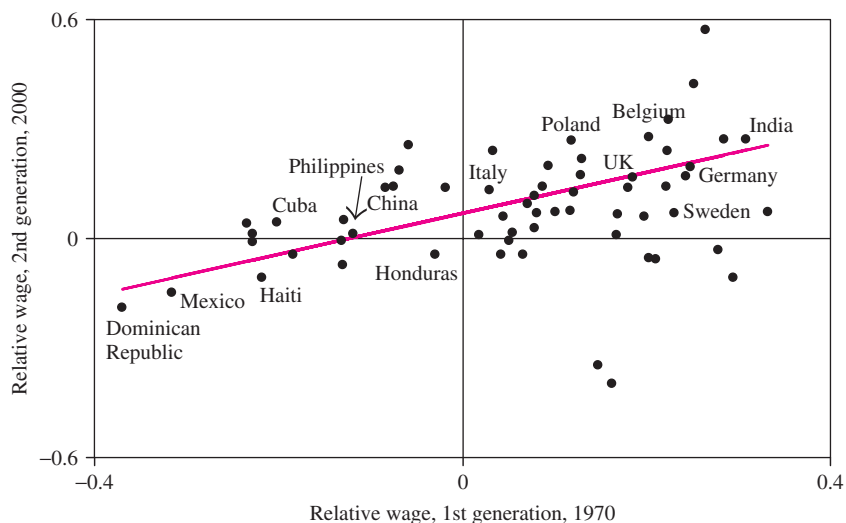
26.0 percent more than first-generation workers. A correct calculation of the second-generation improvement, however, reveals much less intergenerational improvement. After all, the typical immigrant in 1970 earned 1.4 percent more than the typical third-generation worker. And the typical second-generation worker in 2000 (who is presumably the descendant of the immigrants enumerated in 1970) earns 6.3 percent more than the baseline. In short, the true intergenerational growth in relative wages was only on the order of 5 percent—rather than the 26 percent implied by the wage differentials observed in 2000.

The data presented in the last section documented that there was a lot of variation in socioeconomic status among national origin groups in the first generation. Some immigrant groups do quite well in the U.S. labor market, while other groups fare much worse. To determine how much of the ethnic differences in economic status that exist among immigrants persist into the second generation, some studies estimate statistical models that relate the relative wage of a second-generation national origin group to the relative wage of their first-generation counterpart.⁴⁰ The statistical analysis, of course, accounts for the fact that first- and second-generation workers observed in a single cross section of data have little biological connection with each other, so the statistical models link the relative earnings of second-generation workers at a particular point in time (e.g., the 2000 cross section) to the earnings of first-generation workers a few decades past (e.g., the 1970 census).

Figure 9-11 shows the intergenerational link for male workers belonging to a large number of national origin groups in the 1970–2000 period. The horizontal axis gives the age-adjusted relative wage of working men in the immigrant generation. These data are obtained from the

FIGURE 9-11
Earnings
Mobility
between First
and Second
Generations of
Americans,
1970–2000

Source: George J. Borjas, "Making It in America: The Immigrant Experience," *The Future of Children* 16 (Fall 2006).



⁴⁰ Borjas, "The Intergenerational Mobility of Immigrants"; George J. Borjas, "Long-Run Convergence of Ethnic Skill Differentials: The Children and Grandchildren of the Great Migration," *Industrial and Labor Relations Review* 47 (July 1994): 553–73; and David Card, John DiNardo, and Eugena Estes, "The More Things Change: Immigrants and the Children of Immigrants in the 1940s, the 1970s, and the 1990s," in George J. Borjas, editor, *Issues in the Economics of Immigration*, Chicago: University of Chicago Press, 2000, pp. 227–70.

1970 census. The vertical axis gives the age-adjusted relative wage of the working men in the second generation, and these data are obtained from the 2000 cross section. There is a strong positive correlation between the average skills of workers in the two generations; the national origin groups that fared economically well in the first generation also fared well in the second.

The upward-sloping regression line illustrated in Figure 9-11 summarizes the statistical link between the relative wages of particular national origin groups across the two generations. If the regression line were relatively flat, it would indicate that there is little connection between the average skills of the ethnic groups in the second generation and the average skills of the immigrant groups. Put differently, all second-generation groups would have relatively similar wages regardless of the economic performance of their parents. In this case, the intergenerational correlation would be near zero, and there would be complete regression toward the mean. If the regression line were relatively steep, there would then be a substantial link between relative wages in the first and second generations. The intergenerational correlation implied by the regression line in the figure is 0.56.

This estimated intergenerational correlation suggests that about half of the wage differential between any two national origin groups in the first generation persists into the second generation. If the average wage of two ethnic groups is 30 percentage points apart in the first generation, the average wage of the two groups is expected to be about 15 percentage points apart in the second. There is some intergenerational mobility, therefore, but ethnicity remains an important determinant of earnings in the second generation.

Human Capital Externalities

Some researchers argue that **social capital**—the set of variables that characterizes the “quality” of the environment where a person grows up or lives—also helps determine the worker’s human capital.⁴¹ For a given level of parental skills, children exposed to “role models” and “peer groups” that are highly educated, have steady employment, and are economically successful will turn out differently from children exposed to role models who are predominantly unemployed or receive public assistance. In effect, the quality of the environment where the child grows up acts as a **human capital externality** in the production of the children’s human capital. In other words, the environment is an external factor—beyond the control of the parents—that affects the human capital accumulation process.⁴²

Human capital externalities attenuate the regression toward the mean across generations. The children’s human capital will depend both on parental skills and on the social capital to which the children are exposed. Children raised in disadvantaged environments will be “pulled down” by the human capital externality, whereas children raised in high-skill neighborhoods will be “pushed up” by the externality. In effect, the human capital externality acts as a double-sided magnet—preventing the children of the particular demographic group from deviating too far from the group mean.

⁴¹ Glenn C. Loury, “A Dynamic Theory of Racial Income Differences,” in Phyllis A. Wallace and A. LaMond, editors, *Women, Minorities, and Employment Discrimination*, Lexington, MA: Lexington Books, 1977; Shelly Lundberg and Richard Startz, “On the Persistence of Racial Inequality,” *Journal of Labor Economics* 16 (April 1998): 292–323; and George J. Borjas, “Ethnic Capital and Intergenerational Mobility,” *Quarterly Journal of Economics* 107 (February 1992): 123–50.

⁴² Of course, parents may be able to attenuate the impact of the environment by moving to areas where the child is exposed to different characteristics.

Theory at Work

HEY DAD, MY ROOMMATE IS SO SMART, I GOT A 4.0 GPA

In 1993, Dartmouth College, a highly selective school in New Hampshire, began to assign incoming freshmen to dorms and to roommates randomly. Each freshman fills out a brief housing slip. In addition to the gender of the student, the slip contains yes/no answers to four questions: Do you smoke? Do you listen to music while studying? Do you keep late hours? and Are you more neat than messy? There are 16 possible combinations of answers. Because rooms are separate by gender, Dartmouth housing officials put the returned slips into 32 different piles and shuffle the piles. Each pile is then ordered randomly and students are allocated to rooms by order. For example, the first two slips in the pile of students who do not smoke, who do not listen to music while studying, who do not keep late hours, and who are more neat than messy are allocated to the same room.

A recent study uses this random assignment of roommates to document the existence of human capital externalities. It turns out that a student's GPA during freshman year affects the GPA of her roommate during freshman year. In particular, students paired with roommates that

have a GPA of, say, 3.9 versus 2.9 will end up with a GPA that is 0.1 point higher. Although this is not a numerically large increase, it provides strong evidence of spillovers in attitudes, study habits, and even knowledge that occur within a dormitory room.

Prior to their initial enrollment, freshmen also were asked if they intended to graduate with honors. It turns out that a student's GPA is also higher if she is lucky enough to be paired with someone who went into Dartmouth intending to graduate with honors. Being paired with someone who thinks she has "a very good chance" of graduating with honors leads to a GPA that is by about 0.3 point higher than if she had been paired with someone who believed she had "no chance."

Unfortunately, these human capital externalities do not seem to last very long. By the time of the senior year, the impact of your roommate's GPA on your own is close to zero.

Source: Bruce Sacerdote, "Peer Effects with Random Assignment Results for Dartmouth Roommates," *Quarterly Journal of Economics* 116 (May 2001): 681–704.

Human capital externalities also can help explain why racial and ethnic differences in labor market outcomes seem to persist across generations. Some racial or ethnic groups do particularly well generation after generation, whereas other ethnic groups do poorly for a very long time. As we have seen, the evidence suggests that 50 percent of the gap in the average wage between any two ethnic groups persists from one generation to the next. Part of this may be attributable to the fact that children who are raised in disadvantaged ethnic environments will tend to have less human capital, even after adjusting for differences in the human capital of the parents.⁴³

Of course, race and ethnicity are not the only environmental factors that influence the human capital accumulation process. There is evidence that such variables as the overall quality of the neighborhood, membership in religious organizations, and the socioeconomic background of a child's classmates influence a child's human capital.⁴⁴ For instance,

⁴³ Borjas, "Ethnic Capital and Intergenerational Mobility."

⁴⁴ Mary Corcoran, Robert Gordon, Deborah Laren, and Gary Solon, "The Association between Men's Economic Status and Their Family and Community Origins," *Journal of Human Resources* 27 (Fall 1992): 575–601; William N. Evans, Wallace E. Oates, and Robert M. Schwab, "Measuring Peer Group Effects," *Journal of Political Economy* 100 (October 1992): 966–91; and Joshua D. Angrist and Kevin Lang, "Does School Integration Generate Peer Effects? Evidence from Boston's Metco Program," *American Economic Review* 94 (December 2004): 1613–34.

residing in a neighborhood that has relatively high levels of criminal activity greatly increases the probability that an individual will enter that profession, even holding parental background constant. Many studies also document “neighborhood effects” in the accumulation of skills, welfare dependency, substance abuse, and teenage pregnancy.

9-8 Job Turnover: Facts

We now turn to one particular type of mobility that occurs frequently in many labor markets: job turnover. As Figure 9-12 shows, the frequency of job turnover among newly hired young workers in the United States is remarkable. The probability that newly hired young workers (who are in their twenties) will leave their jobs within the next 24 months is nearly 75 percent. In contrast, workers who have a lot of seniority rarely leave their jobs: The probability that a job that has already lasted 10 years will terminate in the next 24 months is less than 5 percent. There is also a strong negative correlation between the probability of job separation and a worker’s age. Workers in their twenties are much more likely to move than workers in their forties and fifties.

It is interesting to note that both the probability of a quit (that is, an employee-initiated job separation) and the probability of a layoff (an employer-initiated job separation) decline with job seniority and with age. Newly hired workers probably have the highest quit *and* layoff rates because both workers and firms are “testing the waters.” Young workers are probably shopping around and trying out employment opportunities in different types of firms, in different industries, and perhaps even in different occupations. Over time, workers find their niche in the firm so that both types of separations occur less frequently. The decline in the quit rate over the life cycle is also implied by the hypothesis that labor turnover is a human capital investment. Older workers have a smaller payoff period over which they can recoup the costs associated with job search, and hence they are less likely to move.

Despite the high probabilities of job turnover among some workers, these statistics disguise an important feature of the U.S. labor market: Long jobs have been the norm rather than the exception. As Figure 9-13 shows, a large (though declining) fraction of men over the age of 35 are in jobs that last at least 20 years.⁴⁵ The period of “job shopping” and frequent turnover observed among young workers seems to end by the time the workers are in their thirties. This result might seem surprising because U.S. employers do not have an explicit “lifetime employment” clause in employment contracts. Nevertheless, many workers in the United States end up in so-called lifetime jobs.

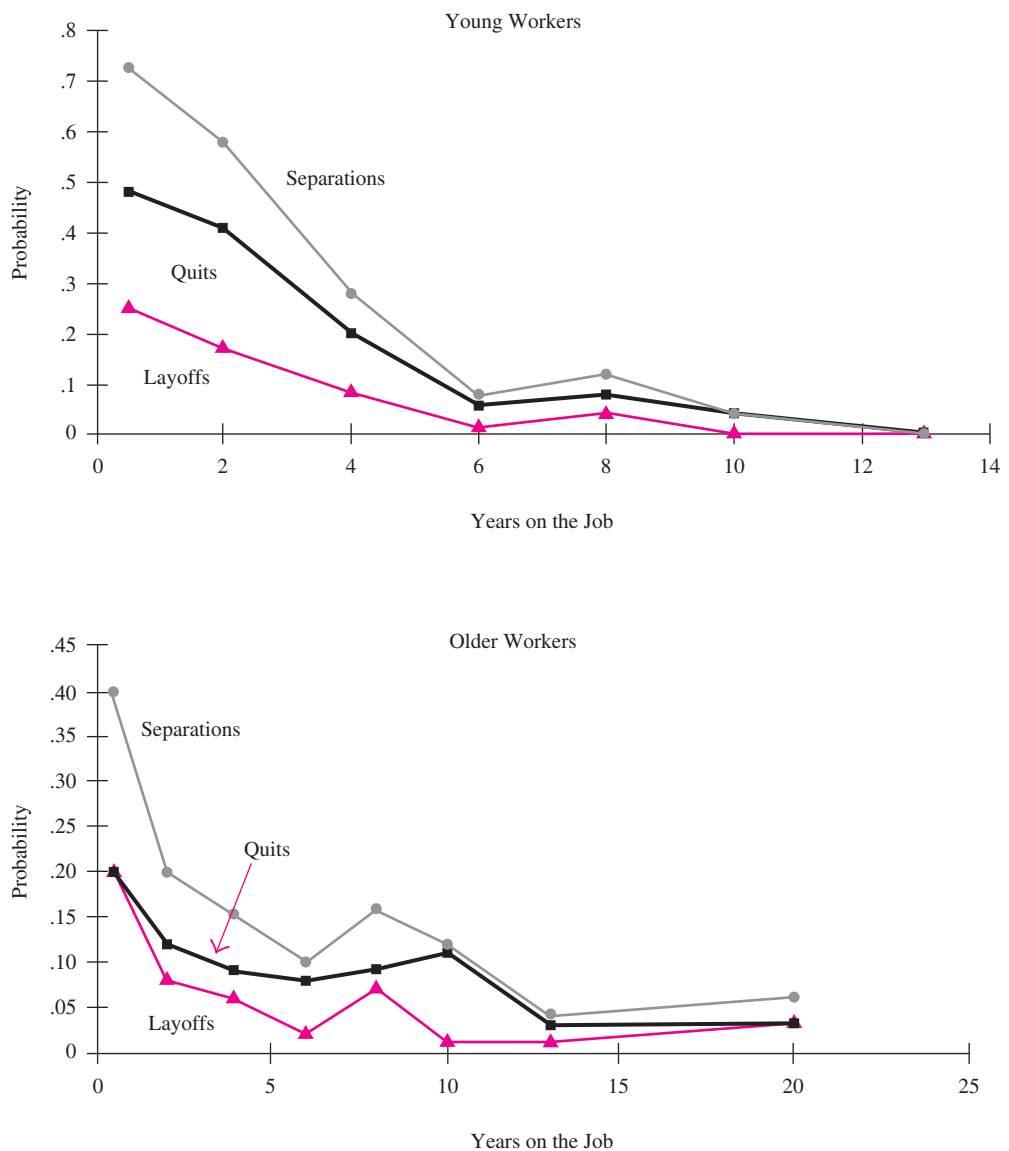
Even though the probabilities of quits and layoffs exhibit the same declining trend within a job and over the life cycle, the evidence indicates that quitters usually move on to higher-paying jobs, whereas workers who are laid off move on to lower-paying jobs. On average, young men who quit get at least a 5 percent wage increase (relative to the wage gain of stayers), whereas young men who are laid off suffer a 3 percent wage decline.⁴⁶ There

⁴⁵ Robert E. Hall, “The Importance of Lifetime Jobs in the U.S. Economy,” *American Economic Review* 72 (September 1982): 716–24; and Manuelita Ureta, “The Importance of Lifetime Jobs in the U.S. Economy, Revisited,” *American Economic Review* 82 (March 1992): 322–35.

⁴⁶ Ann P. Bartel and George J. Borjas, “Wage Growth and Job Turnover: An Empirical Analysis,” in Sherwin Rosen, editor, *Studies in Labor Markets*, Chicago: University of Chicago Press, 1981, pp. 65–90; see also Jacob Mincer, “Wage Changes and Job Changes,” *Research in Labor Economics* 8 (1986, Part A): 171–97.

FIGURE 9-12 Probability of Job Turnover over a Two-Year Period for Young and Older Workers

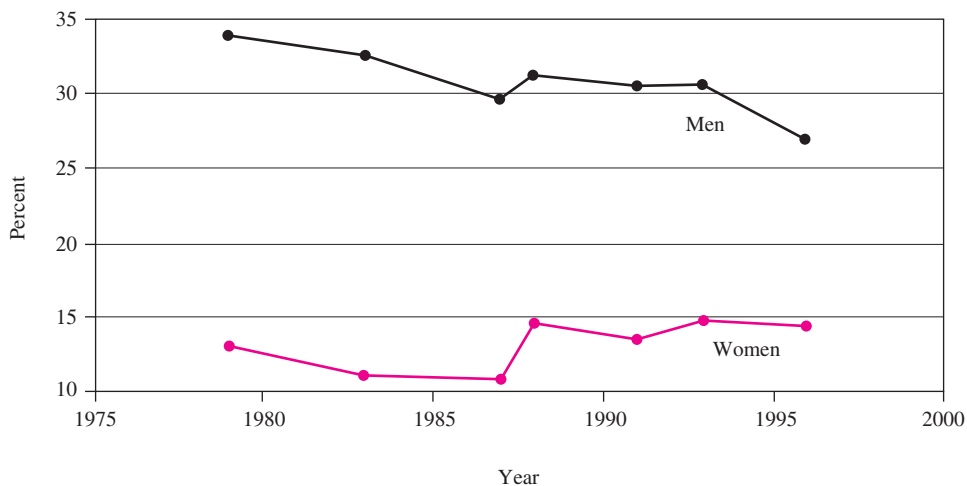
Source: Jacob Mincer and Boyan Jovanovic, "Labor Mobility and Wages," in Sherwin Rosen, editor, *Studies in Labor Markets*, Chicago: University of Chicago Press, 1981, p. 25.



are also important differences in the postseparation employment histories of workers who quit and who are laid off. Most workers who quit find employment without any intervening unemployment spell in between jobs, whereas workers who are laid off typically experience an unemployment spell.

FIGURE 9-13 Incidence of Long-Term Employment Relationships, 1979–1996 (percent of workers aged 35–64 in jobs lasting at least 20 years)

Source: Henry S. Farber, “Mobility and Stability: The Dynamics of Job Change in Labor Markets,” in Orley C. Ashenfelter and David Card, editors, *Handbook of Labor Economics*, vol. 3B, Amsterdam: Elsevier, 1999, p. 2449.



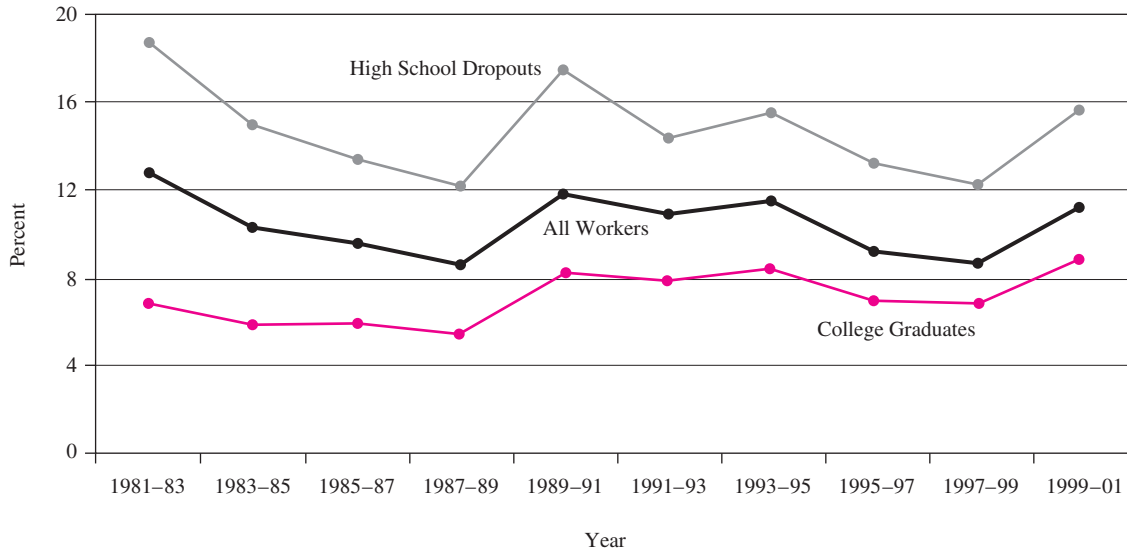
As we saw in the last chapter, there was a substantial increase in wage inequality in the United States in the 1980s and 1990s. This change in the wage structure seems to have been accompanied by an increase in job instability.⁴⁷ A larger number of workers report that they have lost their jobs because of slack work, because the plant closed, or because their positions were abolished. In fact, the rate of job loss—that is, the fraction of workers who claim to have lost their jobs for these reasons—remained high in the 1990s, despite the fact that the economy was booming during this period. Figure 9-14 illustrates the trend in the rate of job loss over the 1981–2001 period. Between 1981 and 1983, about 12.8 percent of workers had lost a job. This three-year job loss rate declined to about 9 percent in the late 1980s and then increased to almost 12 percent in the mid-1990s.

Not surprisingly, the rate of job loss is highest among the least-educated workers. About 16 percent of high school dropouts lost their jobs between 1999 and 2001. It turns out, however, that there was also increased job instability among highly educated workers. Although the rate of job loss for college graduates hovered around 6 or 7 percent throughout much of the 1980s, it increased to over 9 percent by the end of the 1990s. It seems, therefore, that the

⁴⁷ Henry S. Farber, “The Changing Face of Job Loss in the United States, 1981–1995,” *Brookings Papers on Economic Activity, Microeconomics* (1997): 55–142. See also Francis X. Diebold, David Neumark, and Daniel Polsky, “Job Stability in the United States,” *Journal of Labor Economics* 15 (April 1997): 206–33; Daniel Jaeger and Ann Huff Stevens, “Is Job Stability in the U.S. Falling? Reconciling Trends in the Current Population Survey and Panel Study of Income Dynamics,” *Journal of Labor Economics* 17 (October 1999, Part 2): S1–S28; and Henry S. Farber, “What Do We Know about Job Loss in the United States? Evidence from the Displaced Workers Survey, 1984–2004,” *Federal Reserve Bank of Chicago Economic Perspectives* 29 (2nd Quarter 2005): 13–28.

FIGURE 9-14 The Rate of Job Loss in the United States, 1981–2001 (percent of workers losing their jobs in a three-year period)

Source: Henry S. Farber, "Job Loss in the United States, 1981–2001," *Research in Labor Economics* 23 (2004): 69–117.



increase in job instability in the U.S. labor market has even affected skill groups that would probably have been relatively immune in earlier years.

9-9 The Job Match

In the simple supply-demand model of competitive labor market equilibrium, the interaction of workers looking for the best job opportunities and employers attempting to maximize profits equalizes the value of marginal product of labor across firms. The equilibrium allocation of workers to firms maximizes the value of labor's contribution to national income. A worker's value of marginal product would not increase if he or she were to switch to another firm, so there is no incentive for *any* type of job separation to occur.

Nevertheless, quits and layoffs are commonly and persistently observed in competitive labor markets. Job turnover arises partly because workers differ in their abilities and because firms offer different working conditions. Moreover, workers lack information about which firm provides the best opportunities, and firms lack information about the workers' true productivity.⁴⁸

Suppose, for instance, that different firms offer different work environments. At Joe's Newsstand, Joe is well organized, plans the worker's schedule well in advance, and gives

⁴⁸ Boyan Jovanovic, "Job Matching and the Theory of Turnover," *Journal of Political Economy* 87 (October 1979): 972–90; see also Derek Neal, "The Complexity of Job Mobility among Young Men," *Journal of Labor Economics* 17 (April 1999): 237–61.

Theory at Work

HEALTH INSURANCE AND JOB-LOCK

The efficient turnover hypothesis suggests that the optimal allocation of workers to firms results when workers move to those jobs where they are most productive. A number of factors, however, may block workers from moving to “better” jobs and hence prevent the economy from attaining an efficient allocation of labor.

For example, a worker’s employer-provided health insurance is generally not portable across jobs in the United States. Moreover, many health insurance programs refuse to cover a new worker’s preexisting medical conditions (sometimes for up to two years). As a result, workers who have a health problem may not want to move to a job where they are more productive because of the potential costs associated with losing health insurance coverage. In fact, 30 percent of the respondents in a recent CBS/New York Times Poll reported that they had stayed in a job they wanted to leave mainly because they did not want to lose their health coverage. The employer-based health insurance system, therefore, induces

a form of “job-lock,” where workers are locked into their jobs even though this allocation of workers to firms might not be efficient.

Recent studies suggest that this type of job-lock may be a significant problem in the U.S. labor market. For instance, families in which a wife is pregnant (a form of preexisting medical condition) show increased mobility among workers who have no health insurance, but reduced mobility among workers who have employer-provided health insurance. Overall, it has been estimated that job-lock reduces the voluntary turnover rate of workers with employer-provided health insurance by as much as 25 percent per year.

Sources: Brigitte C. Madrian, “Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job-Lock?” *Quarterly Journal of Economics* 109 (February 1994): 27–54; and Mark C. Berger, Dan A. Black, and Frank A. Scott, “Is There Job Lock? Evidence from the Pre-HIPAA Era,” *Southern Economic Journal* 70 (April 2004): 953–76.

the worker a reasonable amount of time in which to complete an assigned task (such as creating a computerized inventory of the store’s newspaper and magazine holdings). At Microsoft, the supervisor waits until the last minute to inform the worker of an upcoming task (such as writing new code for the latest update of a spreadsheet program) and then imposes a tight deadline. If a particular worker does not perform well under such stressful conditions, the value of the match between this worker and Joe may be higher than the value of the match at Microsoft. Other workers, however, might find that their productive juices flow when faced with tight deadlines, and, for those workers, the value of the match at Microsoft would be higher.

The notion that each **job match** (that is, each particular pairing of a firm and a worker) has its own unique value implies that both workers and firms can improve their situations by shopping around.⁴⁹ In other words, it matters if a particular computer programmer is employed at Microsoft or at Joe’s Newsstand. A worker has an incentive to search for a work environment that “fits.” This search would increase the worker’s productivity and wage. The firm also wants to search for workers who are well suited to the firm’s environment. This search would increase the firm’s profits.

⁴⁹ An interesting study of the link between the expectation of job loss and subsequent job turnover is given by Melvin Stephens Jr., “Job Loss Expectations, Realizations, and Household Consumption Behavior,” *Review of Economics and Statistics* 86 (February 2004): 253–69.

If workers and firms knew exactly which particular match had the highest value, workers would look for the best firm, firms would look for the best worker, and there would be no need for turnover after the initial “marriage” was consummated. The sorting of workers and firms would be the optimal sorting, the one that maximizes the total value of labor’s product.

Both firms and workers, however, are ill-informed about the true value of the match at the time the job begins. Over time, both the worker and the firm may realize that they incorrectly predicted the value of the match. Moreover, firms and workers know that there are other workers and firms out there that would provide a better match. Job turnover, therefore, is the mechanism that labor markets use to correct matching errors and leads to a better and more efficient allocation of resources. This type of turnover is called **efficient turnover**, for it increases the total value of labor’s product in a competitive labor market.

9-10 Specific Training and Job Turnover

As we saw earlier, workers who have been employed on the job for only a short time have a very high probability of both quitting and being laid off, whereas workers who have more seniority are unlikely to experience either type of job separation. A simple explanation of this relationship uses the concept of firm-specific training introduced in Chapter 7.⁵⁰ At the beginning of an employment relationship, the worker and firm have not yet invested in skills that are specific to that job, and hence no “bond” between the two parties exists. Once firm-specific skills are acquired, the worker’s productivity in this firm exceeds his wage (lowering the probability of layoff) and the worker’s wage in this firm exceeds the wage he could get elsewhere (lowering the probability of a quit). Therefore, specific training implies that there should be a negative relationship between the probability of job separation and job seniority *for a given worker*, as illustrated in Figure 9-15.⁵¹

As we saw earlier, the available evidence clearly indicates that workers with seniority are less likely to change jobs than newly hired workers. It is tempting to conclude from this cross-sectional correlation that labor turnover rates indeed decline as a particular worker acquires more experience on the job. To document this correlation correctly, however, we have to show that as a *given* worker ages on the job, *his* probability of job separation declines. The comparison of different workers at different points of their tenure on the job may say nothing about whether the probability of separation declines for a particular worker.

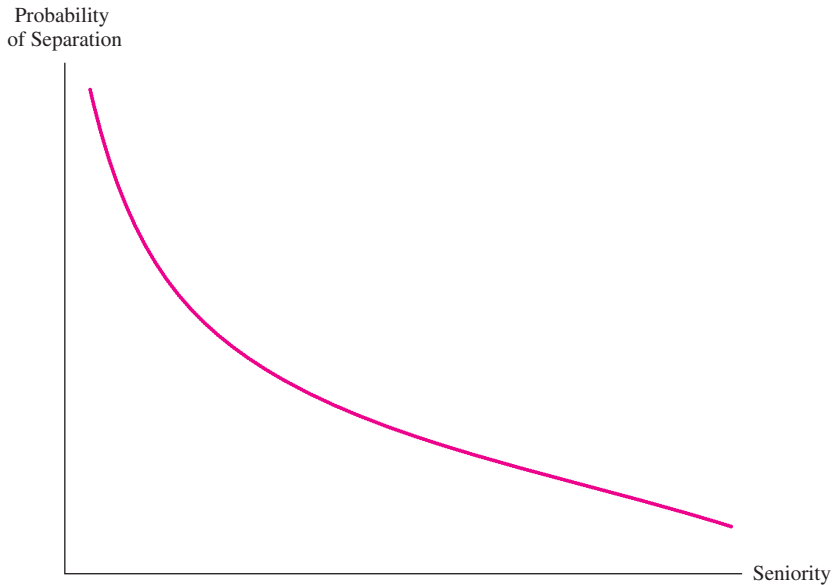
To see why, consider a labor market where there are two types of workers: “movers” and “stayers.” Movers perennially believe that the grass is greener elsewhere and incur the

⁵⁰ An excellent survey of this literature is given by Henry S. Farber, “Mobility and Stability: The Dynamics of Job Change in Labor Markets,” in Orley Ashenfelter and David Card, editors, *Handbook of Labor Economics*, vol. 3B, Amsterdam: Elsevier, 1999, pp. 2440–83. A recent empirical study is given by Lalith Munasinghe, “Specific Training Sometimes Cuts Wages and Always Cuts Turnover,” *Journal of Labor Economics* 23 (April 2005): 213–33.

⁵¹ When a worker’s probability of job separation declines the longer he has been employed on a particular job, we say that the probability of job separation exhibits “negative state dependence.” In other words, the probability of turnover depends negatively on the length of time that the individual has spent in a particular employment state (that is, on a particular job).

FIGURE 9-15 Specific Training and the Probability of Job Separation for a Given Worker

If a worker acquires specific training as he accumulates more seniority, the probability that the worker will separate from the job declines over time.



necessary costs to try out alternative opportunities. In contrast, stayers doubt that things will improve if they move elsewhere and are not willing to incur the costs associated with job turnover. Movers, therefore, have a high probability of job separation; stayers have a low probability.

The key implication of the stayer-mover distinction for the analysis of turnover probabilities is easy to grasp. Because movers are footloose and have a high propensity for turnover, it is unlikely that many movers have acquired a lot of seniority. Most movers, therefore, will have short job tenures and very high turnover propensities. At the same time, because stayers exhibit a lot of inertia, they will tend to have higher job tenure. The correlation between the probability that a worker might quit his job in the next year with the level of job tenure would be negative. But this correlation does not arise because the probability of separation declines for a particular worker—after all, the movers are always movers and the stayers are always stayers—but because workers with low job tenures are likely to be movers. Therefore, it is incorrect to conclude that specific training is important simply because the data indicate that more senior workers are less likely to change jobs than newly hired workers.

A few studies have attempted to determine if the probability of separation declines for a single worker as he or she acquires more job experience. This research typically analyzes the histories of labor mobility for a large number of individual workers over a large span of their working lives. These studies generally find some evidence of the mover-stayer phenomenon in the labor market. There is, for instance, a very strong correlation between a

worker's probability of changing jobs today and the same worker's probability of changing jobs in the near future. Put differently, there seems to be something like the "mover" phenomenon in the population.⁵²

At the same time, there is evidence suggesting that separation rates *do* decline within the job for a particular worker. Even after controlling for differences in turnover probabilities among workers, the probability that a new job terminates in the first year is .5, the probability that the job terminates in the second year is .3, in the third year .25, and in the fourth year .2. After 10 years on the job, the probability of separation is less than 3 percent.⁵³ The evidence thus suggests that specific training may play an important role in cementing the employment relationship between the firm and the worker.

9-11 Job Turnover and the Age-Earnings Profile

Job turnover changes the shape of the worker's age-earnings profile. As noted earlier, young men who quit their jobs experience substantial increases in their wages, whereas workers who are laid off often experience wage cuts. Job turnover, therefore, causes an immediate shift on the *level* of the mover's age-earnings profile, as illustrated in Figure 9-16. As drawn, the wage level increases substantially at ages t_1 and t_3 , when the worker quits his job, and declines at age t_2 when he is laid off.

However, the impact of labor turnover on the age-earnings profile is not restricted to the level of the postseparation wage.⁵⁴ Figure 9-16 also shows the potential impact of labor turnover on the *slope* of the age-earnings profile by contrasting the age-earnings profiles of two workers, a mover and a stayer. The stayer has a continuous profile that is quite steep, so that the rate of wage growth *within the job* is substantial. The mover switches jobs several times and experiences a change in the wage level at each job change. Within a given job, however, the age-earnings profile of the mover is relatively flat.

The existence of firm-specific training, in fact, implies this type of relationship between job turnover and the slope of the age-earnings profile within a job. Workers and firms engaged in a long-term employment relationship have incentives to invest in specific skills. Because workers pay for part of the costs and collect part of the returns to the investment, wage growth is steeper in those jobs that have relatively large specific capital investments, namely, longer jobs. A worker's earnings, therefore, depend not only on total labor market experience but also on his job history and on his seniority on the current job.

Many studies document that workers who have been on the job for a long time earn more than newly hired workers, even after controlling for differences in the worker's age. The wage gap between two similarly aged workers who differ only in that one of the workers has one more year of seniority is on the order of 2 to 3 percent.⁵⁵ Although this

⁵² Henry S. Farber, "The Analysis of Interfirm Worker Mobility," *Journal of Labor Economics* 12 (October 1994): 554-93; and Jacob Mincer and Boyan Jovanovic, "Labor Mobility and Wages," in Sherwin Rosen, editor, *Studies in Labor Markets*, Chicago: University of Chicago Press, 1981, pp. 21-63.

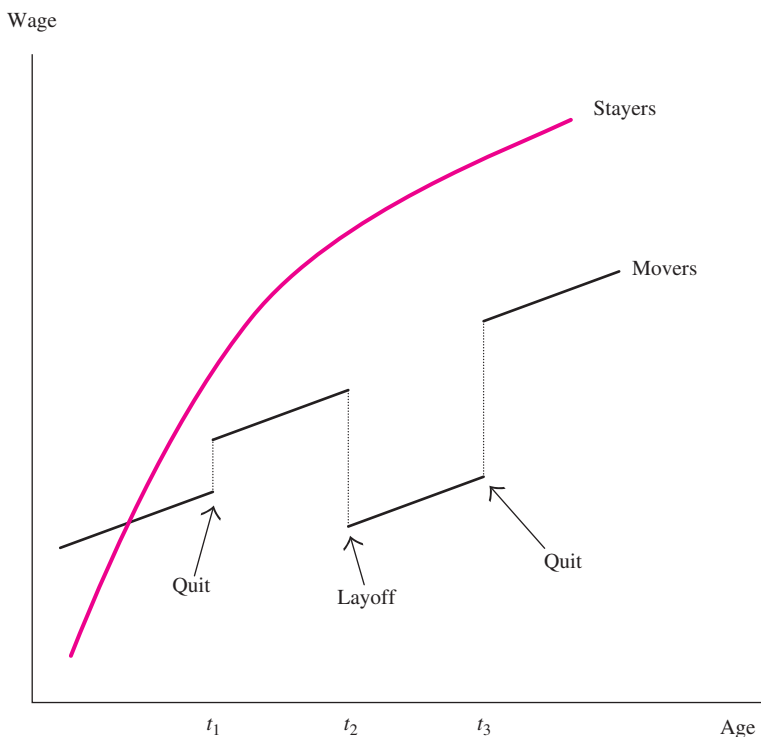
⁵³ Farber, "The Analysis of Interfirm Worker Mobility."

⁵⁴ A careful study of the evolution of earnings with experience is given by Henry S. Farber and Robert Gibbons, "Learning and Wage Dynamics," *Quarterly Journal of Economics* 111 (November 1996): 1007-47.

⁵⁵ Michael R. Ransom, "Seniority and Monopsony in the Academic Labor Market," *American Economic Review* 83 (March 1993): 221-33.

FIGURE 9-16 Impact of Job Mobility on Age-Earnings Profile

The age-earnings profile of movers is discontinuous, shifting up when they quit and shifting down when they are laid off. Long jobs encourage firms and workers to invest in specific training and steepen the age-earnings profile. As a result, stayers will have a steeper age-earnings profile within any given job.



evidence seems to be consistent with the specific training hypothesis, there has been a heated debate over whether job tenure truly has an independent impact on earnings.

The source of the problem is that the positive correlation between earnings and job tenure *across workers* can be interpreted in a very different way. Suppose that some workers got lucky and found high-paying jobs. These workers are in good matches and earn w_H per year as long as they remain in their jobs. Note that the earnings of a well-matched worker do not grow over time. Other workers have not been as lucky; they are badly matched and have low earnings. These workers earn w_L per year as long as they remain in their bad jobs. Note that the earnings of a poorly matched worker also do not grow over time. In this hypothetical example, therefore, job tenure has no impact on earnings. Put differently, specific training plays no role in determining wages.

The lucky workers who earn w_H are satisfied with their current economic situation and feel little need to “test the waters” and look for alternative employment. Workers in good matches, therefore, will have low probabilities of job separation, and these workers will tend to have a lot of seniority. In contrast, the workers who are not well matched are dissatisfied with their current employment situation. These workers will have high probabilities of job turnover and little seniority.

The correlation between earnings and job tenure across workers will be positive, implying that wages grow with job tenure for a given worker when no such thing is actually observed in this simple market. For a given worker, wages do not grow with tenure. Across workers, however, seniority is associated with higher wages because workers with a lot of job seniority are likely to be in good matches, and workers with little seniority are in bad matches. It would be incorrect, therefore, to conclude that the cross-sectional correlation says anything about the importance of specific training in the labor market.

To isolate the impact of seniority on a given worker's wage, we need to track a worker's earnings over time both as he gets older and as he accumulates firm-specific experience. Many studies attempt to track the worker's employment history over a large span of the working life. The evidence on the relationship between wages and seniority is mixed. In fact, a flurry of studies conducted in the late 1980s concluded that job tenure had *no* impact on earnings above and beyond the effect of total labor market experience.⁵⁶ In other words, there was no evidence that earnings actually grew on the job after controlling for the quality of the match between the worker and the firm.

If correct, the finding that wages are unaffected by seniority has important policy implications and would fundamentally alter the way we think about and interpret many labor market outcomes. For example, the unimportance of seniority would suggest that skills in the labor market are mainly general. This portability of skills across firms implies that the costs of worker displacement and unemployment are relatively small (because the worker's human capital stock is not adversely affected by involuntary job separations).

More recent work reexamines the evidence and concludes that wages do indeed increase with tenure, although there is still some disagreement over the magnitude of the correlation.⁵⁷ The first 10 years of job seniority may increase a worker's earnings by about 10 percent more than he could earn elsewhere. Put differently, each year of seniority may expand the worker's earnings opportunities by about 1 percent.

Summary

- The probability of moving across geographic regions depends on economic conditions in both the destination and origin states, and on migration costs. The probability of migration rises when incomes are low in the state of origin or when incomes are high in the state of destination. The probability of migration also rises if migration costs are low.
- If mobility decisions are made jointly by all household members, the migration flow includes a number of tied movers. Tied movers suffer a private loss from the migration, but the loss is more than outweighed by the gains of other family members.

⁵⁶ Katherine G. Abraham and Henry S. Farber, "Job Duration, Seniority, and Earnings," *American Economic Review* 77 (June 1987): 278–97; Joseph G. Altonji and Robert A. Shakotko, "Do Wages Rise with Job Seniority?" *Review of Economic Studies* 54 (July 1987): 437–59; Robert H. Topel, "Job Mobility, Search, and Earnings Growth," *Research in Labor Economics* 8 (1986, Part A): 199–233; and Robert C. Marshall and Gary A. Zarkin, "The Effect of Job Tenure on Wage Offers," *Journal of Labor Economics* 5 (July 1987): 301–24.

⁵⁷ Robert H. Topel, "Specific Capital, Mobility, and Wages: Wages Rise with Job Seniority," *Journal of Political Economy* 99 (February 1991): 145–76; Joseph G. Altonji and Nicolas Williams, "The Effects of Labor Market Experience, Job Seniority, and Mobility on Wage Growth," *Research in Labor Economics* 17 (1998): 233–76; and Margaret Stevens, "Earnings Functions, Specific Human Capital, and Job Matching: Tenure Bias Is Negative," *Journal of Labor Economics* 21 (October 2003): 783–806.

- If there are cohort effects in the skill composition of the immigrant flow, the fact that earlier immigrants earn more than newly arrived immigrants in a cross section need not indicate that immigrants experience significant assimilation as they accumulate “U.S.-specific” labor market experience. There seem to be sizable cohort effects in the immigrant flow entering the United States, with more recent waves being relatively less skilled than earlier waves.
- Immigrants are not randomly chosen from the population of a source country. If the rate of return to skills in the receiving country exceeds the rate of return to skills in the country of origin, the immigrant flow is positively selected and immigrants have above-average skills. If the rate of return to skills in the receiving country is lower than the rate of return to skills in the country of origin, the immigrant flow is negatively selected and immigrants have below-average skills.
- Efficient turnover improves the quality of the job match between worker and firm and increases labor’s contribution to national income.
- Workers who have been on the job for a long time are less likely to move than younger workers. This correlation arises because workers differ in their turnover propensities and because specific training reduces the probability of turnover as workers age on the job.
- Workers who have been on the job for a long time earn more than newly hired workers. This correlation arises because workers in good matches tend to stay on the job longer and because the accumulation of specific training increases the worker’s productivity.

Key Concepts

cohort effects, 338
 efficient turnover, 356
 human capital
 externality, 349
 job match, 355

labor mobility, 321
 negative selection, 343
 positive selection, 343
 repeat migration, 325
 return migration, 325

Roy model, 341
 social capital, 349
 tied mover, 331
 tied stayer, 331

Review Questions

1. Show how workers who wish to maximize the present value of lifetime earnings calculate the net gains to migration, and discuss how this net gain depends on incomes in the states of origin and destination and on migration costs.
2. Show how one can use the human capital framework to obtain an estimate of migration costs.
3. Why is there a difference between the private gains to migration and the family’s gains to migration? Discuss how this difference generates tied stayers and tied movers. Can both the husband and the wife be tied movers?
4. Show how cohort effects in the immigrant flow affect the interpretation of the cross-sectional age-earnings profiles of immigrants.
5. Describe how the immigrant flow is chosen from the population of the country of origin. Why are some immigrant flows positively selected and other immigrant flows negatively selected?
6. How do quits and layoffs help improve labor market efficiency?
7. How should one interpret the fact that—all other things equal—workers with a lot of seniority are less likely to separate from their jobs than newly hired workers?
8. How should one interpret the fact that—all other things equal—workers with a lot of seniority earn more than newly hired workers?

Problems

- 9-1. Suppose a worker with an annual discount rate of 10 percent currently resides in Pennsylvania and is deciding whether to remain there or to move to Illinois. There are three work periods left in the life cycle. If the worker remains in Pennsylvania, he will earn \$20,000 per year in each of the three periods. If the worker moves to Illinois, he will earn \$22,000 in each of the three periods. What is the highest cost of migration that a worker is willing to incur and still make the move?
- 9-2. Nick and Jane are married. They currently reside in Minnesota. Nick's present value of lifetime earnings in his current employment is \$300,000, and Jane's present value is \$200,000. They are contemplating moving to Texas, where each of them would earn a lifetime income of \$260,000. The couple's cost of moving is \$10,000. In addition, Nick very much prefers the climate in Texas to that in Minnesota, and he figures that the change in climate is worth an additional \$50,000 to him. Jane, on the other hand, prefers Minnesota's winters, so she figures she would be \$50,000 worse off because of Texas's blistering summers. Should they move to Texas?
- 9-3. Mickey and Minnie live in Orlando. Mickey's net present value of lifetime earnings in Orlando is \$125,000, while Minnie's is \$500,000. The cost of moving to Atlanta is \$25,000 *per person*. In Atlanta, Mickey's net present value of lifetime earnings would be \$155,000, while Minnie's would be \$510,000. If Mickey and Minnie choose where to live based on their joint well-being, will they move to Atlanta? Is Mickey a tied mover or a tied stayer or neither? Is Minnie a tied mover or a tied stayer or neither?
- 9-4. Suppose a worker's skill is captured by his efficiency units of labor. The distribution of efficiency units in the population is such that worker 1 has one efficiency unit, worker 2 has two efficiency units, and so on. There are 100 workers in the population. In deciding whether to migrate to the United States, these workers compare their weekly earnings at home (w_0) with their potential earnings in the United States (w_1). The wage-skills relationship in each of the two countries is given by

$$w_0 = 700 + 0.5s$$

and

$$w_1 = 670 + s$$

where s is the number of efficiency units the worker possesses.

- Assume there are no migration costs. What is the average number of efficiency units among immigrants? Is the immigrant flow positively or negatively selected?
 - Suppose it costs \$10 to migrate to the United States. What is the average number of efficiency units among immigrants? Is the immigrant flow positively or negatively selected?
- 9-5. Suppose the United States enacts legislation granting all workers, including newly arrived immigrants, a minimum income floor of \bar{y} dollars. (Assume there is positive selection of migrants from the home country to the United States.)
- Generalize the Roy model to show how this type of welfare program influences the incentive to migrate to the United States. Ignore any issues regarding how the welfare program is funded.

- b. Does this welfare program change the selection of the immigrant flow? In particular, are immigrants more likely to be negatively selected than in the absence of a welfare program?
- c. Which types of workers, the highly skilled or the less skilled, are most likely to be attracted by the welfare program?
- 9-6. In the absence of any legal barriers on immigration from Neolandia to the United States, the economic conditions in the two countries generate an immigrant flow that is negatively selected. In response, the United States enacts an immigration policy that restricts entry to Neolandians who are in the top 10 percent of Neolandia's skill distribution. What type of Neolandian would now migrate to the United States?
- 9-7. A country has two regions, the North and the South, which are identical in all respects except the hourly wage and the number of workers. The demand for labor in each region is

$$w_N = \$20 - .5E_N \quad \text{and} \quad w_S = \$20 - .5E_S$$

where E_N and E_S are millions of workers. Currently there are 6 million workers in the North and 18 million workers in the South.

- a. What is the wage in each region?
- b. If there are no shocks to the economy, migration over time will result in an equalization of wages and employment. What would be the long-run wage and employment level in each region?
- c. Return to the original setup where there are 6 million workers in the North and 18 million workers in the South. As a policymaker, you decide not only to allow 2 million immigrants of working age to enter your country, but you have the authority to resettle the immigrants wherever you want. How should you distribute immigrants across the regions to maximize the country's immigration surplus? Besides maximizing the immigration surplus in the short-run, in what other ways does your distribution of immigrants help the economy?
- 9-8. Phil has two periods of work remaining prior to retirement. He is currently employed in a firm that pays him the value of his marginal product, \$50,000 per period. There are many other firms that Phil could potentially work for. There is a 50 percent chance of Phil being a good match for any particular firm and a 50 percent chance of him being a bad match. If he is in a good match, the value of his marginal product is \$56,000 per period. If he is in a bad match, the value of his marginal product is \$40,000 per period. If Phil quits his job, he can immediately find employment with any of the alternative firms. It takes one period to discover whether Phil is a good or a bad match with a particular firm. In that first period, while Phil's value to the firm is uncertain, he is offered a wage of \$48,000. After the value of the match is determined, Phil is offered a wage equal to the value of his marginal product in that firm. When offered that wage, Phil is free to (a) accept, (b) reject and try some other firm, or (c) return to his original firm and his original wage. Phil maximizes the present value of his expected lifetime earnings, and his discount rate is 10 percent. What should Phil do?

364 Chapter 9

- 9-9. Under the recently enacted 2001 tax legislation in the United States, all income tax filers can now deduct from their total income half of the expenses incurred when moving more than 50 miles to accept a new job. Prior to the change, only tax filers who itemized their deductions were allowed to deduct their moving expenses. (Typically, homeowners itemize their deductions and renters do not itemize.) How would this change in the tax bill likely affect the mobility of homeowners and renters?
- 9-10. Would a single-payer, federally funded health care insurance system increase or decrease labor mobility in the United States?

Selected Readings

- George J. Borjas, "Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants," *Journal of Labor Economics* 3 (October 1985): 463–89.
- George J. Borjas, "Self-Selection and the Earnings of Immigrants," *American Economic Review* 77 (September 1987): 531–53.
- George J. Borjas, "Long-Run Convergence of Ethnic Skill Differentials: The Children and Grandchildren of the Great Migration," *Industrial and Labor Relations Review* 47 (July 1994): 553–73.
- Barry R. Chiswick, "The Effect of Americanization on the Earnings of Foreign-Born Men," *Journal of Political Economy* 86 (October 1978): 897–921.
- Dora L. Costa and Matthew E. Kahn, "Power Couples: Changes in the Locational Choice of the College Educated, 1940–1990," *Quarterly Journal of Economics* 115 (November 2000): 1287–314.
- Henry S. Farber, "The Changing Face of Job Loss in the United States, 1981–1995," *Brookings Papers on Economic Activity, Microeconomics* (1997): 55–142.
- Brigitte C. Madrian, "Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job-Lock?" *Quarterly Journal of Economics* 109 (February 1994): 27–54.
- Lalith Munasinghe, "Specific Training Sometimes Cuts Wages and Always Cuts Turnover," *Journal of Labor Economics* 23 (April 2005): 213–33.
- Robert H. Topel, "Specific Capital, Mobility, and Wages: Wages Rise with Job Seniority," *Journal of Political Economy* 99 (February 1991): 145–76.

Web Links

The U.S. Census Bureau maintains up-to-date information on mobility patterns within the United States: www.census.gov/population/www/socdemo/migrate.html.

The Web site of Citizen and Immigration Canada has the "test" that allows a potential applicant to determine if he or she qualifies for a visa: www.cic.gc.ca/english/skilled/assess/index.html.

The Web site of Australia's Department of Immigration and Multicultural and Indigenous Affairs has the similar test required by Australian authorities: www.immi.gov.au/allforms/skill_points.htm.