CHAPTER 5

When People Can Leave: The Effect of Prospective Emigration

People do not actually need to leave a country for it to be affected by the existence of outside opportunities for that country's skilled labor. Indeed, the simple *prospect* of leaving one's country can change domestic economic and political outcomes. The prospect of emigration can also affect an individual's decisions to accumulate financial, social, and enterprise capital. Prospective emigration can be examined under three conditions: when an individual is uncertain about his or her chances of emigration but is certain of receiving a higher return on human capital investments should the opportunity to emigrate arise; when emigration is an *option*—one that, under some conditions, might be "bought" with additional education; and when the availability of outside options is uneven across skill levels and can subtly reshape a society, whether in regard to the progressivity of the fiscal system or the incentive to use "voice" to reform domestic institutions.

A Prospect of Emigration

Various models have been constructed to test the "brain drain" theory of skilled emigration, all of which begin with the basic premise that individuals face some probability of getting a foreign visa and will obtain a higher return on their domestically accumulated human capital if they get that visa.[1] The higher expected return induces them to acquire more

1. Mountford (1997); Stark, Helmenstein, and Yegorov (1997); Stark and Chau (1998); Stark and Wang (2001); Beine, Docquier, and Rapoport (2001, 2002).

human capital. Even though emigration does drain off talent, some remain, and these may be greater than would have been present had the prospect to emigrate not arisen. (We develop our own model of this process in the next section.) One model used to estimate the effect of migration on human capital formation leads to the conclusion that "migration prospects exert a positive effect on human capital formation for a cross section of 50 developing countries" and that this holds for different specifications of the human capital equation.[2] According to this model's calculations of the net balance between this "brain gain" and the "brain drain" effect of the actual subsequent migration, mobile human capital makes countries with low levels of human capital and low migration rates for skilled workers net "winners." Even though it turns out that there are more so-called loser countries than winning ones, the winners tend to have larger populations. Indeed, the winners make up 80 percent of the total developing world's population.

One shortcoming of such models is that they assume emigration results from a sort of lottery in which visas are awarded randomly and all individuals have an equal probability of obtaining one. As outlined in chapter 3, rich countries actively screen a large portion of their skilled worker inflows as they attempt to "cream off" the best talent.[3] If workers fully understand the screening process used by a rich country, they can predict with certainty whether they will be granted a work visa.[4] Individuals who qualify and intend to take up the visa may well be induced to acquire additional human capital before leaving. But since they have definite plans to leave, the home country has no chance of gaining from these additional investments. What is more, those individuals whose chances of obtaining a visa are very small will have no added inducement to acquire more human capital.[5]

Besides rich-country screening, three factors may diminish the importance of this prospective channel. First, consider the substitution and

2. See Beine and others (2002, p. 37). They use Carrington and Detragiache's (1998) estimates of migration rates.

3. For an excellent discussion of screening and its implications for these models, see Commander, Kangasniemi, and Winters (2002).

4. This will be most likely when the rich country uses objective criteria for selecting immigrants, with little room for subjective judgments. Examples might be entry on the basis of the Canadian or Australian points systems.

5. Rich-country screening may also be biasing the empirical results of Beine and others (2002). The observed correlation between migration rates and human capital formation may be partly due to the effect that the countries more successful at producing human capital are more likely to have workers who pass rich-country immigration screens.

income effects of a higher expected return. An individual might respond to the higher expected return by substituting education for work or leisure at any given level of well-being, in accordance with the model just discussed. If the immediate prospect of emigrating provides a higher expected return for an individual's present skills level, however, the income effect predicts that one would rather enjoy the fruits of one's labor than struggle to acquire more education. This is like the teenagers who have to decide whether or not to work hard to gain admission into a good local university. If they do not emigrate, a university education will be essential to maintaining a good standard of living. However, if they have the opportunity to emigrate to New York or London, where they will earn a decent salary as a construction worker, for example, they might choose to forgo university education. Although they would likely earn more with a degree, the tedium of study might cancel out the expected difference in pay.

Second, skills acquired at home simply might not make the transition abroad. Many cabdrivers in North American cities, for example, seem overqualified for the job. Part of the problem is that foreign credentials are often not recognized in the destination country—even when those very qualifications were the basis for entry under a skills-based screening system. It seems that education and labor market experience acquired abroad are valued significantly less than such human capital acquired domestically.[6] Thus potential immigrants might be better off accumulating human capital after they have immigrated (assuming, of course, that they do not have to acquire that education to overcome the rich-country screening process). Interestingly, it has been found that education acquired after immigration has a very high return.[7] This suggests that even though the value of a foreign education is significantly discounted at first, it complements post-immigration education and thus still might be worth acquiring by those who foresee a high prospect of emigrating.[8]

Third, most of these models assume that just because there is a demand, there will be a corresponding supply. This assumption fails

6. See Friedberg (2000).

7. Friedberg (2000).

8. Findings recently released from Canada's 2001 census show immigrants to be relatively heavy acquirers of education. For example, for those in the 25 to 29 age group, 15.2 percent of immigrants who came during the 1990s were in full-time education and 11.8 percent were in part-time education. The figures for all other residents of Canada were 11.1 and 9.2 percent, respectively.

badly, not only with regard to those countries that people want to leave the most, such as Liberia or Moldova, but also with regard to structural considerations, including unstable university systems and limited faculty, which can severely restrict supply (see chapter 6). Accordingly, even if the prospect of immigration substantially increases the incentive to acquire human capital while still at home, severe weaknesses in the higher education system of poor countries will limit such outcomes.

A Simple Model of Prospective Migration

The key idea underlying this model is that a higher probability of international migration has two opposing effects on the economy's expected stock of human capital when a higher return to human capital is available outside the country. First, an increased probability of migration increases the ex ante return to human capital, thus increasing investments in that capital. Second, for any given level of human capital investment, a higher probability of migration increases the expected human capital loss. For the purposes of the model, we treat the probability of migration as being exogenously determined by the immigration policies of other countries. Thus the model captures the effect of changes in foreign immigration policies on human capital investment and retention.

Each individual is assumed to make a final decision on how much human capital, h, to accumulate at time zero. A unit of human capital yields a dollars in domestic wages per unit of time if the individual works domestically, and a^f dollars if the individual works abroad. The constant instantaneous probability of the individual emigrating at any given point in time (conditional on not having emigrated before) is given by m. We assume that all migrations are permanent. Discounting future expected cash flows by an instantaneous interest rate r, we can write the expected value of an individual's human capital as

$$V = \frac{1}{1+r}[ah + (1-m)V + mV^f], \tag{5-1}$$

where V^f is the value of the individual's human capital conditional on having emigrated. Since the individual receives a wage of $a^f h$ in perpetuity post immigration, V^f is simply the value of this perpetuity,

$$V^f = \frac{a^f h}{r}. \tag{5-2}$$

Substituting (5-2) into (5-1) allows us to solve for the expected value of the individual's human capital as a function of the level of human capital, the probability of migration, and the interest rate:

$$V = \frac{1}{r+m}\left(ah + \frac{ma^f h}{r}\right). \tag{5-3}$$

The marginal value of an additional unit of human capital is given by

$$\frac{\partial V}{\partial h} = \frac{1}{r+m}\left(a + \frac{ma^f}{r}\right). \tag{5-4}$$

Turning to the cost of accumulating human capital, C, we assume a simple convex cost function,

$$C = \frac{1}{2}h^2. \tag{5-5}$$

Thus the *marginal cost* of acquiring human capital is taken to be a rising function of the level of human capital. One possible rationale for the rising marginal cost is that the opportunity cost in terms of lost wages is greater the more human capital the individual has. With our chosen functional form, the marginal cost is exactly equal to the prior level of human capital:

$$\frac{\partial C}{\partial h} = h. \tag{5-6}$$

Equating equations (5-4) and (5-6) allows us to solve for the optimal level of human capital:

$$h^* = \frac{1}{r+m}\left(a + \frac{ma^f}{r}\right). \tag{5-7}$$

Not surprisingly, the effect of an increase in the probability of migration on the optimal level of human capital to accumulate depends on the relative return to human capital in domestic and foreign labor markets,

$$\frac{\partial h^*}{\partial m} = \frac{1}{(r+m)^2}(a^f - a). \tag{5-8}$$

We assume from this point on that the foreign return is higher than the domestic return (that is, $a^f > a$).

Now consider how the home country is affected by an increase in the probability of migration. For simplicity, we measure this by the worker's domestic wage, ah, and assume that the country gets no benefit once the

individual has emigrated. The expected value of an individual who has not yet emigrated, but who faces a constant probability of migration equal to *m,* is thus given by the perpetuity,

$$X = \frac{ah^*}{r+m}, \tag{5-9}$$

where the overall discount rate is now the sum of the interest rate and the (constant) probability of migration. It is now apparent that an increase in the probability of migration affects two factors: (1) the optimal choice of human capital, and (2) the rate at which the future potential human capital flows are discounted:

$$\frac{\partial X}{\partial m} = \frac{a}{(r+m)^3}\left[(a^f - a) - \left(a + \frac{m a^f}{r}\right)\right]. \tag{5-10}$$

If a^f is sufficiently greater than a, an increase in the probability of migration will actually increase the expected value of the worker to the home country. If m becomes large enough, however, the higher foreign return effect will be outweighed by the higher discount rate effect.[9] It is possible, then, that the optimal (in the narrow sense of X-maximizing) probability of migration, m^*, is non-zero—that is, there is a range where the country actually benefits from a higher probability of losing its workers. Such a case is shown in figure 5-1.[10]

The Option of Emigration

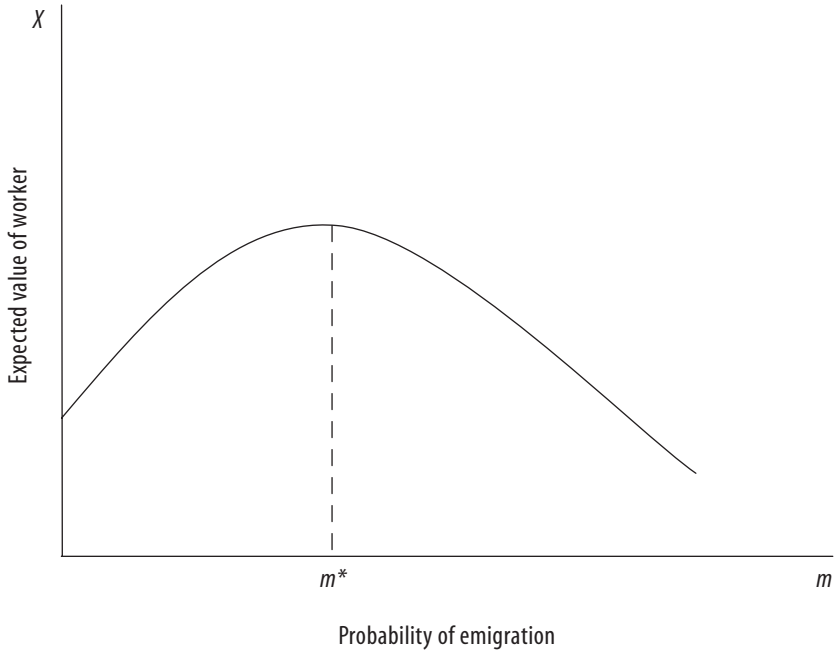
In place of a randomized lottery, rich-country governments are currently developing elaborate screening programs to select the most highly skilled temporary and permanent migrants. In this way, emigration becomes an option rather than a prospect for many highly skilled individuals.

When emigration is an option, there is an increase in domestic human capital accumulation, as demonstrated under the model of emigration as a prospect. As discussed previously, additional education might be necessary to first acquire the option to emigrate. Canada's points system,

9. Note that when m is equal to one the term in brackets is strictly positive given that $af > a$.

10. If this is true, starting from a zero value for m, an increase in m must strictly increase X. It is easy to show using equation (10) that a necessary and sufficient condition for this to be true is that af is at least twice as large as a.

Figure 5-1. Brain Gain with Emigration



for instance, makes it extremely difficult to qualify for entry without a university education.

The existence of the option might also distort the type of education acquired, pushing individuals toward more portable skills rather than toward those narrowly tailored to the home economy. Where a country's existing comparative advantage ties it to low-growth industries, the option to emigrate might actually help the country break out of this growth trap. Suppose that a developing country has a very limited software industry, though it possesses some prospects for developing one. This country might find itself in a catch-22 situation in that its college students might remain wary of studying programming because their future with these skills is presumably uncertain, yet a supply of programmers is exactly what the country needs to get the software industry off the ground. A strong global market for programmers can reduce the risk of acquiring these skills, whether or not a student plans to emigrate. Therefore the option of emigrating can lead students to acquire more forward-looking skills, possibly allowing a country to experiment and thereby better determine where its comparative advantages lie.

Outside Options and Effects on Inequality

It is no secret that international labor mobility can adversely affect the design of an optimal fiscal system (one that maximizes social welfare).[11] The basic problem is clear: once the fiscal system is made too progressive, it will generate an exodus of highly educated and high-earning individuals, who want to avoid becoming large net contributors to the system. When such contributors leave, the country suffers direct fiscal losses (see chapter 6) as well as the losses endured by those remaining behind (TRBs) when the fiscal system is made less progressive in order to keep people from leaving. Some evidence from the past two decades suggests that top marginal tax rates (MTRs) for developing countries dropped from about 56 percent in the mid-1980s to 34 percent in 2001. For industrialized countries, top MTRs dropped to about 40 percent (figure 5-2). Although migration is not the only reason behind these declines, it appears to be limiting the degree to which countries can push the progressivity of the tax regime.

Evidence on the links between the propensity of the skilled to migrate (taken from the *World Competitiveness Handbook*) and income inequality appears in table 5-1 and figure 5-3. The archetypal cases are Brazil and India. The highly skilled in Brazil have a lower propensity to migrate because they can command a much higher income at home than their Indian counterparts. The reason is intuitive: why leave if one can already enjoy a lifestyle that is close to that of the destination country? The share of national income accruing to the top 20 percent of the population in Brazil (64 percent) is substantially greater than that in India (46 percent).

Still, there are other factors that would weigh into one's decision to emigrate. These range from political uncertainty and violence (as in Colombia and Venezuela) and an uncertain future for the country's minority (as for the whites in South Africa) to perhaps a "national culture" (as in the Philippines). Note, too, that the effects of inequality might wane with increasing average income (as in Hungary and Korea). Nonetheless, if one controls for top marginal tax rates and per capita income, there appears to be a fairly strong relationship between inequality and the "brain drain" such that in more unequal societies the elite have less incentive to leave. Furthermore, the results are robust if the

11. See the collection of papers in Bhagwati (1982).

Figure 5-2. Top Marginal Tax Rates (MTRs), Developing versus the Top Seventeen OECD Countries, 1985–2001

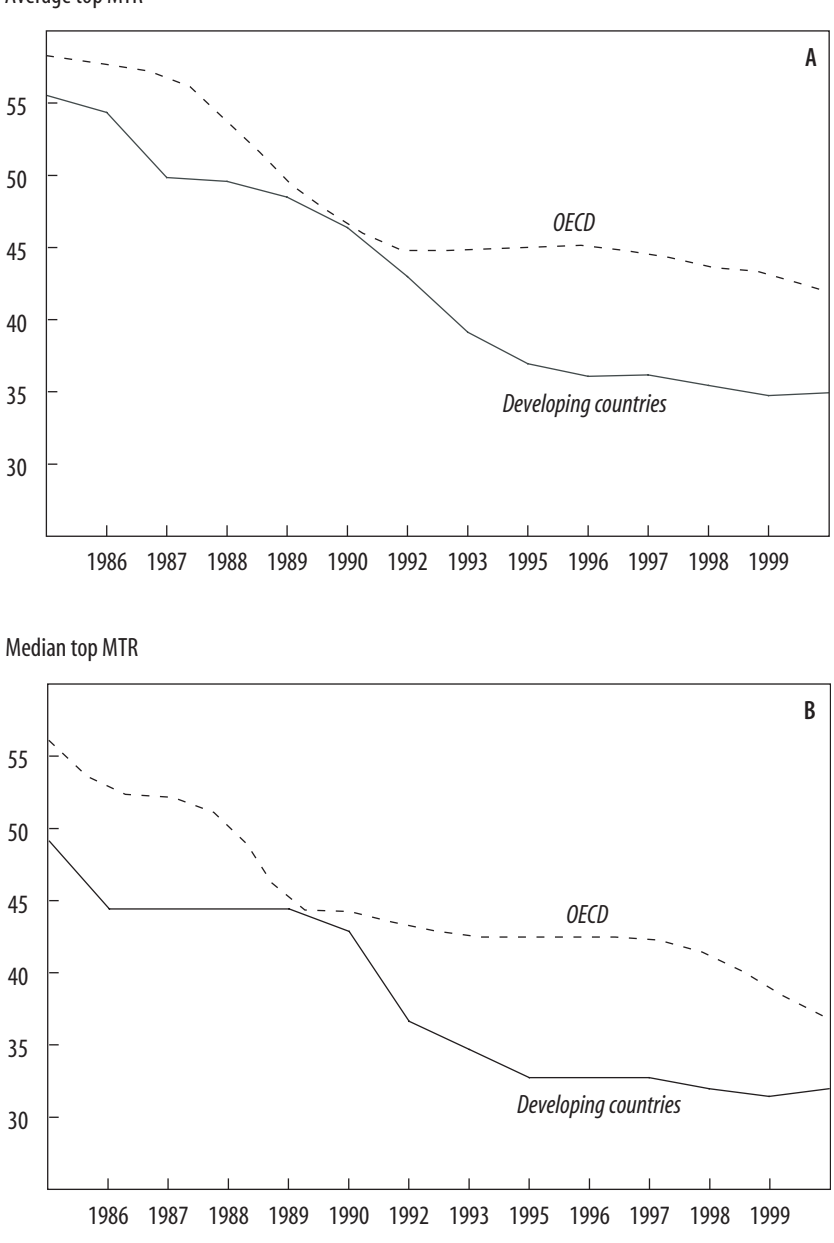
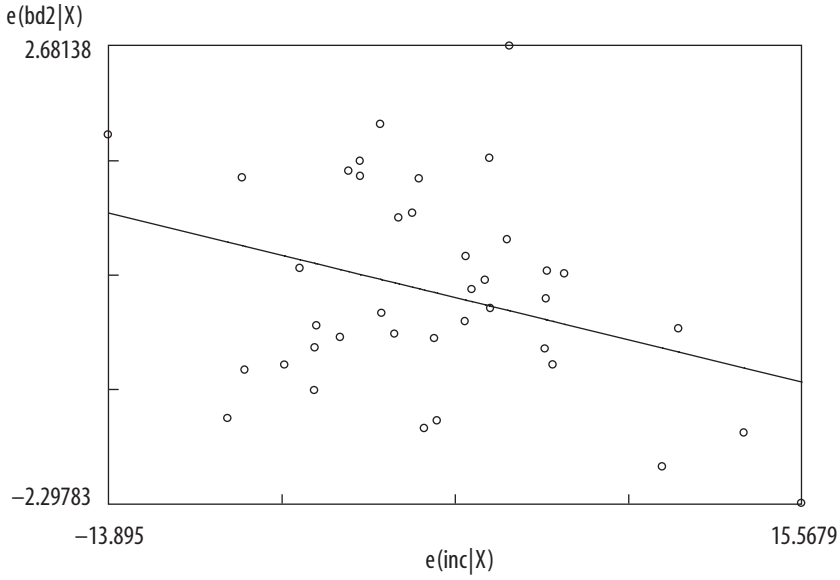


Table 5-1. Inequality and the Propensity of the Highly Skilled to Emigrate

Country	*Brain drain (10=high, 0 = low)*	*Percent income held by top 20 percent*
Australia	4.30	41.30
Austria	3.12	33.30
Belgium	4.27	34.50
Brazil	4.07	63.80
Canada	5.88	39.30
Chile	2.68	61.00
China	6.22	46.60
Colombia	8.05	60.90
Czech Republic	3.40	35.90
Denmark	4.59	34.50
Estonia	4.63	41.80
Finland	3.46	35.80
France	4.95	40.20
Germany	3.32	38.50
Greece	4.24	40.30
Hong Kong	4.62	47.00
Hungary	4.48	39.90
Iceland	4.11	37.00
India	6.85	46.10
Indonesia	5.00	44.90
Ireland	2.86	42.90
Israel	3.94	42.50
Italy	5.36	36.30
Japan	3.17	35.70
Korea	5.89	39.90
Malaysia	5.62	53.80
Mexico	4.86	58.20
Netherlands	2.81	40.10
New Zealand	7.17	46.90
Norway	2.84	35.80
Philippines	7.08	52.30
Poland	5.38	40.90
Portugal	4.04	43.40
Russia	5.52	53.70
Singapore	4.42	48.90
Slovak Republic	6.62	31.40
Slovenia	4.11	35.40
South Africa	7.92	64.80
Spain	2.71	40.30
Sweden	5.52	34.50
Switzerland	3.66	40.30
Thailand	3.97	48.40
Turkey	5.54	47.70
United Kingdom	4.22	43.00
United States	1.45	46.40
Venezuela	8.31	53.10

Sources: For propensity to migrate: World Competitiveness Handbook. For inequality: World Development Indicators.

Figure 5-3. Inequality and the Propensity to Migrate



Coefficient = −.06245735, standard error = .02960818, *t* statistic = −2.11.

share of the top 10 percent is considered instead of the top 20 percent. Low-income countries might well be caught between a rock and a hard place, in that they have to either tolerate much higher levels of income inequality or risk losing their best and brightest.

Outside Options: Other Effects

"Outside options" for a privileged portion of the population may affect a society in a myriad of ways. Three of particular interest here are public spending on education, the unemployment rate, and the incentive to improve domestic policies and institutions.

Public sector funding on education springs from numerous rationales: to overcome pecuniary and nonpecuniary externalities that drive a wedge between the private and social return to education, to counter imperfect capital markets, or to provide a means of generating lifetime redistribution and breaking intergenerational cycles of poverty without

too much economic distortion. These arguments become less cogent, of course, if the subsidized individual is likely to leave after receiving an education. For example, if the argument for public funding depends on positive externalities, the external benefits accrue to the residents of other countries if an individual leaves. As with the adoption of a less progressive tax system, the rational response by policymakers might be to spend less public money on education. Of course, the government does not know ex ante who will leave. Thus even those who do not leave, and never had any intention of doing so, might end up having lower access to publicly funded education.

It is easy to see how skilled emigration will lead to larger skill differentials for purely demand- and supply-based reasons. But where wages of workers with specialized skills are determined through domestic bargaining, even the *option* of emigrating can lead to higher wages by improving the specialized workers' bargaining position. Attractive outside options also play an important role in many theories of involuntary unemployment, especially in the form of unemployment benefits.[12] In models where wages are set in bargaining between unions and firms, generous benefits can lead to high unemployment in general equilibrium, for unions push for higher wages as they become less fearful of unemployment. Similar results arise in a shirking-based efficiency wage model, as workers must be paid a higher wage to induce them not to shirk in a world where job loss is not particularly feared. An outside option such as an attractive foreign alternative will affect the working of a domestic labor market by encouraging larger wage demands. The result, however, is that a higher level of domestic unemployment among the workers that choose to remain might be required to bring wage demands into line with what it is feasible for firms to pay. In effect, the options of the potentially mobile group can create higher unemployment for the immobile group through their influence on wage setting.

The prospect of emigration can also have significant political economy consequences. Just after the collapse of the Soviet Union, Cuba faced a severe economic crisis, but the government refused to change any policies. As popular discontent grew in 1994, between 35,000 and 50,000 people fled Cuba in what became known as *la crisis de los balseros*, or the rafters' crisis. The exodus eased the atmosphere somewhat but forced Castro to open up the economy (if only modestly) to

12. See, for example, Layard, Nickell, and Jackman (1991).

avert a more ominous crisis. The Cuban government allowed limited forms of domestic private enterprise and foreign investment and also permitted millions of Cubans with relatives in the United States to receive remittances from abroad. The strategy worked. The inflow of new money pulled Cuba's economy back from the brink, even as it undermined the country's socialist system.

Still, when the elites that are best positioned for reform do not see their future (or that of their children) in their country of origin, they are likely to put less effort into making domestic institutions work better. Consider the long-term consequences of rich families sending their children abroad for education, a common phenomenon in developing countries. For decades, Pakistani elites sent their children abroad for their undergraduate education. This was one reason why this sector of the population had little direct stake in reforming the country's higher education system, with deep long-term economic and political consequences for the country.

Outside Options and Other Forms of Capital Accumulation

Obviously, the prospect of emigration can induce financial capital accumulation, as people save the means to fund an expensive move and to set up a new life in another country. Less obvious is the effect on the accumulation of local social capital.[13] On the one hand, people might shy away from developing local social ties when there is a substantial possibility that they will be moving on to a new country. On the other hand, social ties that endure can create valuable opportunities for "brokerage" and for tapping into domestic information that is hard to obtain. The role of such long-distance ties in relation to diaspora is discussed in chapter 7.

The prospect of emigration may also affect the incentive to start new businesses. Given the start-up costs involved, many entrepreneurs might be reluctant to launch a business if they believe the opportunity to emigrate will suddenly arise. Thus the very prospect for emigration that increases the incentives for the acquisition of human capital also reduces the incentives to use that human capital for entrepreneurship.

13. See Agrawal, Cockburn, and McHale (2003).

As this chapter has demonstrated, even the mere possibility of emigration sparks changes in individuals' preferences and behavior toward the accumulation of human, social, and financial capital. However, it is far more difficult to ascertain whether and to what degree this is to the benefit of the home country, the destination country, or both. In chapter 6, we provide some quantitative estimates of the effects on a home country when a portion of the skilled population actually leaves.