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THREE ESSAYS ON THE LABOR-MARKET CHARACTERISTICS OF IMMIGRANTS

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ABSTRACT

THREE ESSAYS ON THE LABOR-MARKET CHARACTERISTICS OF IMMIGRANTS

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This dissertation is a theoretical and empirical analysis of the labor-market characteristics of different immigrant groups.

The first two groups considered are skill-based and family-based immigrants. By estimating the earnings difference between these two groups from a range of countries, I develop an indicator of the nature of the immigrant flows from those countries. A small difference between the two immigrant groups from a country indicates a family-based group that is quite skilled, so the immigrant selection process of that country leads to the immigration of the high skilled. The opposite applies if there is a large difference in skill levels.

I expand on the analysis by examining whether the variation in my indicator of labor-market quality can be explained by country-specific characteristics. In so doing, I test the model developed by Borjas in his A.E.R. article of September 1987.

The next two groups I compare are family-based immigrants and those who won a greencard in one of the lotteries of

recent years. These groups differ in that one group joins family members while the other does not. My analysis includes how these groups differ in their locational choices.

The final two groups of immigrants that I compare are those who arrived in the years 1979 to 1980 and 1989 to 1990. This comparison helps to determine whether the decline in immigrant quality of recent decades continued into the 1980's.

The data I use is from the Immigration and Naturalization Service. I find that the relative skill levels of family-based and skill-based immigrants differ across countries. Part of this variation can be explained by differences in income inequality, so the Borjas model receives support. The lottery immigrants are more skilled than the family-based immigrants and are more geographically concentrated. Finally, the data show that the decline in immigrant quality did not persist in the 1980's.

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Introduction

Section 1: Statistics on Immigration

Although the United States is a nation of immigrants there has been a long debate in this country on the desirability of admitting more immigrants. As a reflection of this, U.S. immigration policy has, since the 1880's, attempted "to restrict the numbers, race and national origin composition of the immigrant flow". [1]

The first of two arguments which underlie concerns over additional immigration is that those admitted will compete in the labor market with U.S. nationals and drive down employment and wages. Underlying this argument is the assumption that immigrants and natives are substitutes in production. The second argument against allowing additional immigration is that the characteristics of immigrants are such that they will not make a positive contribution to U.S. life, but rather will create social tension and put pressure on public budgets through their use of publicly provided programs and facilities. The assumption implicit here is that immigrants do not possess the skills required for success in the U.S. labor market or for assimilation into U.S. life.

It is the second argument on immigrant characteristics which motivates this dissertation. The specific characteristic that I consider is labor-market quality. Central to the

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[1] Borjas, 1990 p4

discussion is whether, and how, immigrant labor-market quality differs across sending countries. I also consider labor-market quality across classes of admission and over time.

Before proceeding with a discussion of the economic issues in the area of immigrant labor-market characteristics, I will put the general issue of immigration in context by considering the number of immigrants coming to the U.S. and the trend in immigration during the century. Table 1 presents the number of legal immigrants coming to the U.S. over the period 1901 to 1990, along with the annual rate per 1000 of the U.S. population.

While the numbers admitted dropped in the middle part of this century, the trend is clearly toward an increase in immigration. When the numbers currently being admitted are considered in the context of low growth in the native population, it is clear that immigrants will make up an increasing proportion of the population and of the labor force.

Along with this growth in the numbers coming to the U.S. there has been a shift in the last fifty years in the source of immigrants. In the period 1941 to 1950, 17.7 percent of legal immigrants came from Latin America and the Caribbean, while 76.6 percent came from Europe and Canada. In the period 1981 to 1990, these numbers were 47.1 percent and 12.5 percent respectively.[2] If it is the case that immigrants from

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[2] Rolph, p24

Table 1: The Flow of Immigrants into the United States 1901-1990

Period	Immigrants Admitted (000,000)	Rate[a]	Percentage of Population Foreign-born[b]
1901-1910	8.8	10.4	-
1911-1920	5.7	5.7	13.2
1921-1930	4.1	3.5	11.6
1931-1940	0.5	0.4	8.8
1941-1950	1.0	0.7	6.9
1951-1960	2.5	1.5	5.4
1961-1970	3.3	1.7	4.7
1971-1980	4.5	2.1	6.7
1981-1990	7.3	3.0	8.6

Source: Elizabeth S. Rolph, Immigration Policies: Legacy from the 1980's and Issues from the 1990's, Rand 1992

[a] Annual rate per 1,000 U.S. population

[b] Includes both undocumented and documented foreign-born residents

different regions have different characteristics then this shift will have a large effect on the overall nature of the immigrant flow.

It should also be pointed out that the vast majority of immigrants locate in a small number of states. Of all immigrants legally admitted between the years 1982 and 1990, 74 percent intended to locate in one of six states: California, Florida, Illinois, New Jersey, New York or Texas. This means that whatever impact immigrants will have, it will be concentrated in these areas.

Section 2: The Issues Involved in Immigrant Labor-Market Quality

The main issue I address in this dissertation is immigrant labor-market quality. The primary question here is whether the skill levels of immigrants are greater or less than those of people born in the United States. The importance of this question stems from the effect labor-market quality has on the impact of immigrants on the U.S. If immigrants are highly skilled and highly educated the potential exists for the impact of immigration to be positive. The influx of such a group would mean the provision of a productive body of people who will contribute to taxes and not be a drain through their use of public assistance programs. Such people are also more likely to assimilate into American life, lessening the potential social strife that can accompany the co-existence of different cultural groups in a society. Furthermore, given the shift in the demands of the U.S. labor market toward more

highly skilled workers, it is possible that high-skilled immigrants will have a growing positive effect.

Alternatively, if immigrants are a low-skilled group and have low education levels the potential exists for immigration to have a negative impact. Such immigrants will not contribute much in terms of productivity or taxation and may have a greater propensity to take advantage of public assistance programs. Likewise, the potential for greater geographic concentration, which tends to hinder assimilation, seems greater among low-skilled immigrants is greater, making the above mentioned social strife more possible.

Although studies such as Borjas (1987a) and Lalonde and Topel (1991) find that immigrants do not depress the wages or employment of native workers, more recent work has produced a different finding. Borjas, Freeman and Katz (1992) and Topel (1994) find that immigration has reduced the wages of low-skilled native workers, presumably because of labor-market competition between low-skilled immigrants and low-skilled native workers. This creates an additional concern over the immigration of the low-skilled. No such labor-market effect has been found for the high-skilled so the same concern is not present for the immigration of the high-skilled.

Rather than immigrants in general being low-skilled or high- skilled, the potential exists for the skill levels of immigrants to differ across countries. The economic issue is whether it is possible to identify country characteristics which determine the nature of the immigrant flow from a

country. The policy issue is then whether it is possible to target admission policies toward countries that send the high-skilled immigrants.

Another issue that arises in this context is the administrative method of granting permanent legal residency to people. In order to ensure that immigrants have desirable labor- market qualities some countries have had immigration policies that deliberately favored the admission of the highly skilled. Immigration law in the United States currently does not in general grant permanent residency with reference to labor-market quality but focuses instead on the humanitarian goal of family re-unification, leaving a broad avenue of entry for low-skilled immigrants.

Section 3: Literature Review

Previous research on the economics of immigration has looked at both the effect of immigration on the U.S. economy and at the characteristics of immigrants. As the latter topic is of relevance here the focus of this review is on papers which deal with immigrants' characteristics.

One of the more important papers in this area is Chiswick (1978), which presents a view of immigrants containing the following elements. When immigrants first arrive in the U.S. they have less knowledge of the U.S. labor market and less U.S. specific education and training than native-born workers. This leads to a wage disadvantage for foreign-born workers relative to comparable native-born workers. Over time the foreign-born workers learn about the U.S. labor market and

acquire U.S. specific training and education. This produces a reduction in the difference between the wages of the foreign-born and the native-born. Were the two groups similar in terms of innate ability and motivation, wage differentials, adjusted for the usual characteristics, should disappear over time. Chiswick, however, hypothesized further that immigrants may be more motivated and have more innate ability than the average native-born citizen. If this is true, the wages of immigrants should not just rise to equal those of the native-born but should rise above them.

Using data from the 1970 Census, Chiswick shows that immigrant wages were below those of the native-born at the time of entry but rose with years in the U.S. and eventually overtook the wages of the native-born. Such a finding put immigrants in a favorable light.

This view of immigrants is also seen in a paper by Carliner (1980). In explaining his observations on the relative earnings of immigrants he makes reference to the higher motivation of immigrants and to their greater preference for money over family ties, leisure and easy work.

A series of papers by Borjas (1985, 1987b, 1991) produced arguments and results that cast doubt on the Chiswick/Carliner findings and on their general view that immigrants had favorable labor-market characteristics. In the 1985 paper Borjas brings up the possibility that the use of a single cross-section to draw implications on the earnings growth of immigrants could suffer from a serious flaw. Although Chiswick

concludes that the observed earnings growth of immigrants is the result of labor-market assimilation, Borjas suggests that the observation could be a result of a decline in the labor-market quality of successive immigrant cohorts. The empirical work in his 1985 paper shows that the use of a single cross-section did indeed overestimate the true earnings growth of immigrants and that within cohort earnings growth was much lower than previously estimated.

This finding implies that there was a decline in the labor- market quality of immigrants across cohorts. This in turn casts doubt on the view that immigrants are always selected from the upper end of a country's ability distribution. In his 1987b and 1991 papers Borjas explores further the issue of immigrant selection and shows theoretically how country-specific characteristics can lead to the immigration of the low skilled from some countries and the high skilled from other countries. Whereas Chiswick and Carliner see selection as being always "positive" in the sense that the best choose to immigrate, Borjas shows how selection could be "positive" or "negative". Furthermore, he demonstrates that relative income inequality between the home and the host countries has a crucial effect on the nature of the immigrant flow from a particular country.

Borjas' empirical work shows that the quality of immigrants does differ across countries of origin and that certain country-specific characteristics can explain the differences. One of the important implications of this is that

a shift in the national- origin mix of immigrants can alter the quality of the immigrant pool. Borjas maintains that the shift in immigration into the U.S. from a European to a Latin American origin has produced the decline in immigrant quality that has been observed in recent decades.

The issue of the interrelation between immigrant earnings and country of origin is also considered by Jasso and Rosenzweig (1986). As in Borjas (1987b), Jasso and Rosenzweig show that differences in the earnings of immigrants across countries can be explained not just by dummy variables for different countries but by country-specific characteristics. They show that the effects of country dummy variables on the earnings of immigrants practically disappear if such factors as economic conditions, travel costs and the level of information available about the U.S. are controlled for.

Lalonde and Topel (1991) look at the decline in the skill levels of immigrants between the 1970's and 1980's and conclude, like Borjas, that the shift in the origin of immigration was almost entirely responsible for the decline. They go on to show, however, that these immigrants assimilate quickly and eventually earn as much as comparable natives. When combined with their observation that immigrants do not have negative effects on the labor-market outcomes of natives, they conclude that the concerns generated by observations of declining immigrant skill levels are overstated.

Characteristics of immigrants other than earnings have also been studied. Borjas and Trejo (1991 and 1993) examine

the propensity of immigrants to use the welfare system and how this propensity differs across countries of origin. As with the work on earnings, their results show that country characteristics can explain much of the variation in welfare use. In particular, recent increases in welfare use by immigrants can be explained by the changing national-origin mix of immigrants.

Bartel and Koch (1991) have studied the propensity of immigrants to migrate within the U.S. This is important because it determines the extent to which any effects of immigrants are dispersed or localized. Their main finding is that there is little evidence that immigrants become more dispersed over time. The only national groups to show some dispersion were Indians, Japanese and Koreans. Younger and more educated immigrants were also found to be more likely to move.

Section 4: Dissertation Outline

The purpose of this dissertation is to add to the insights already produced in the area of immigrant labor-market characteristics. As with other work, I explore variation in the labor-market quality of immigrants across countries. However, an important and useful departure is contained in the work to be presented here. In both the theorethical and empirical analyses I use, in an unprecedented way, the fact that immigrants are admitted under different legal classes of admission. Most work in this area treats all immigrants as a single group, regardless of the legal basis on

which they were admitted. By separating legal immigrants into those admitted on the basis of their skills, family contacts, refugee status and lottery winning, important insights will be gained into the nature of the immigrant flows from different countries.

The structure of the dissertation is a follows. In Chapter 2 I develop a model which shows how the labor-market quality of skill-based immigrants relative to the family-based immigrants differs across countries. This quality difference between the two groups of immigrants reflects the general nature of the immigrant flow from a country, which is of immediate interest. A small difference between the skill-based and the family-based immigrants from a particular country means that the family-based must be reasonably high skilled, so such a country, in general, sends high quality immigrants. A big difference between the skill- based and family-based means that the family-based must be low skilled and in this case the country sends low skilled immigrants, in general. I estimate these differences for a range of countries using data on immigrants from the years 1978 to 1980. These estimates have immediate interest since they allow us to identify which countries send which types of immigrants. The analysis does go a step further, however, as I to explain variation in the wage premium of the skill-based immigrants relative to the family-based across countries, using country-specific characteristics consistent with the model. In this way it becomes possible to predict which types of countries will send which types of

immigrants.

The purpose of Chapter 2 is similar to that of Borjas (1987b, 1991) and Jasso and Rosenzweig (1986) but the approach is very different, exploiting the existence of the different classes of admission. The results show how a legislative shift toward skill requirements for more immigrants would have a different effect on the nature of the immigrants flows across countries. For some countries, skill requirements would have little effect since those who choose to immigrate are quite skilled anyway. For other countries, such requirements would increase the quality of immigrants by excluding the low skilled who wish to immigrate.

In Chapter 3 I turn my attention to those immigrants who gained legal admission to the United States through the lottery programs of the late 1980's and 1990. Again, an effort is made to use the relative earnings of two groups of immigrants to gain some insight into the nature of the immigrant flow from a particular country. I develop a model to show how the migration decision of the lottery immigrants differs from that of the family-based immigrants. Home-country economic conditions are then incorporated into the model and predictions about the relative skill levels of the lottery and family-based immigrants are derived. I estimate the skill differences between the two groups for some countries and consider the results in the context of the predictions of the model. In this chapter I also consider the location decisions of a group of lottery immigrants to see how such decisions

differ from those of the family immigrants. Location of immigrants is an important issue when the pressures faced by areas of high immigrant concentrations are considered. Hence, additional insights into the location decision are useful.

The lottery immigrants are a potentially valuable resource in the examination of the immigration decision. Immigrants who are admitted because of family ties or because of their skills do not necessarily give researchers a random sample of those who want to immigrate. The desire of these individuals to immigrate had to be supported by the legal ability to do so, hence the possible non-random nature of the immigrant pool. The lottery immigrants are, however, a random sample of those who wish to immigrate and so studying them can produce a truer picture of those who find it optimal to immigrate.

In Chapter 4, I compare the family-based and skill-based immigrants again, this time using data on immigrants admitted in the years 1988 to 1990. In Chapter 2, support is found for the ideas of the model, most notably that the level of inequality in the sending country has an important effect on the quality of the immigrants coming from that country. The empirical analysis is done again to see if this support is maintained using data from the later period. The idea that inequality in the home country would influence the nature of the immigrant flow was first proposed by Borjas (1987b). The model used in Chapter 2 builds on the Borjas' ideas by incorporating class of admission, so the empirical work of

Chapters 2 and 4 can be seen as further testing those ideas. The final part of Chapter 4 contains an examination of the relative labor-market quality of immigrants admitted in the years 1979 to 1980 and 1989 to 1990. Borjas has suggested that rising income inequality in the United States may lead to an increase in the quality of immigrants into the U.S. Given the rise in inequality over the 1980's and data on immigrants admitted at the beginning and end of the period, I am able to test this hypothesis. As the skill level of immigrants declined from the 1960's to 1980, it is important to see if this trend continued through the 1980's. It is also possible to see if any change in immigrant skill levels is the result of a change in the country of origin mix of immigrants, as was the case between the 1960's and 1980.

Chapter 2

The Effect of Class of Admission on Immigrant Selection across Countries

Section 1: Introduction

A common finding in the literature on the characteristics of immigrants is that immigrants are not merely a random sample from their countries of origin. They are the products of a selection process which leads the immigrant group from a country to differ from the population of that country in its labor-market characteristics. Another common finding is that certain economic characteristics of each country of origin influence the nature of the group who choose to migrate. Hence, immigrants from different countries will differ in their labor-market characteristics.

This reported difference in the labor-market quality of immigrants across countries has important implications for immigration policy. Current U.S. policy pays very little attention to the labor-market characteristics of immigrants as a criterion in determining eligibility for permanent residency. As such, the actual labor-market quality of the immigrant pool depends to a great extent on the outcomes of the immigrant selection process across countries and the numbers coming from various countries. An understanding of the selection process and how national characteristics influence the outcome of the process can help to identify which sorts of immigrants will come from which sorts of countries.

Borjas (1987b) and Jasso and Rosenzweig (1986) have

addressed these issues, examining the labor-market characteristics of immigrants from various countries and the relationship between the labor-market quality of immigrants from a country and the characteristics of that country.

In this chapter, I add to the examination of the difference in the labor-market quality of immigrants across countries. I do so in a way that exploits a useful element in the structure of U.S. immigration policy. A small proportion of permanent residency visas are granted each year to immigrants who are classified as highly skilled. Although the recipients of these visas are the products of the immigration selection process of their various countries, they are constrained by U.S. law to be in the upper region of the U.S. earnings distribution. As such, this group will be similar across countries. A much larger proportion of permanent residency visas are awarded on the basis of family ties to U.S. citizens or permanent residents. As labor market criteria are not used for this group in allowing immigration, the position of this group in the U.S. earnings distribution is unconstrained by U.S. law. The position of the group in the earnings distribution depends on the nature of the immigrant selection process and will differ across countries as the parameters underlying the process differ.

The existence of these two groups, skill- and family-based immigrants, allows me to examine the immigrant selection process across countries. A small difference in labor-market quality between the skill- and family-based immigrants from a

country indicates that the selection process of that country tends to lead to the migration of high quality people. Alternatively put, the group that is unconstrained by law in its labor-market characteristics is similar to the group that is constrained to be in the upper end of the earnings distribution. A large difference between the two indicates that the selection process tends to result in the migration of the low-skilled. Here the unconstrained group is quite different from the group who are admitted because of their high skill levels.

The approach I take in this chapter will be as follows. I first outline a model showing how the divergence between the skill-based and family-based groups in labor-market characteristics may differ across countries. In testing the model, I show that there is a divergence across countries in the difference between the labor-market quality of the skill-based and family-based immigrants. I then attempt to explain the pattern across countries using country-specific variables consistent with the model presented. Finally, I present a summary and some conclusions.

Section 2: The Model

In the years which I examine in the empirical part of this chapter, 1978, 1979 and 1980, about 500,000 immigrants gained permanent residency annually. The 500,000 were admitted under a number of "classes of admission". Of these, some 290,000 were subject to numerical restrictions. The group which was not subject to numerical restrictions was made up of

refugees and spouses, parents and minor children of adult U.S. citizens. The numerically restricted group was broken up into seven preference categories and included unmarried adult children of U.S. citizens, spouses and unmarried children of permanent resident aliens, etc. Another group which was included in the numerically restricted category was the professional and highly skilled group. Ten percent of the 290,000 visas were reserved for such individuals, their spouses and their children. It is to this group that I am referring when I write about the skill-based immigrants. The family-based immigrants are those admitted because of family ties. Refugees are not dealt with at any length in this chapter.

I now present a model which deals with the difference between the labor-market quality of skill-based and family-based immigrants. Consider first the skill-based group. For now, I assume that the mean earnings of this group are equal across countries. Given that individuals in this group are admitted because of their high skill levels, the mean earnings of this group will be greater than the mean earnings of the U.S. population. Denoting the mean earnings of the immigrants by $E(y_s)$ and the mean earnings of the U.S. population by μ_1, let

$$E(y_s) = \mu_1 + \delta \qquad (2.1)$$

where δ is some positive number.

The focus of this chapter is on the difference between the labor-market quality of the skill-based and the family

based immigrants across countries. The extent of the difference between the two reflects the extent to which the immigrant selection process of a country tends to lead to the immigration of high- or low-skilled people when the outcome of that process is unconstrained by U.S. law. Denoting the mean earnings of the family-based group by $E(y_f)$, the focus is on the variation in the following quantity across countries:

$$E(y_s) - E(y_f). \tag{2.2}$$

As $E(y_s)$ is assumed to be constant across countries, the variation in (2) will come about through variation in $E(y_f)$. Even if this assumption of a fixed $E(y_s)$ is relaxed, it appears that the variation in $E(y_f)$ would be greater than that in $E(y_s)$ due to the fact that $E(y_f)$ can vary over the entire range of the earnings distribution. $E(y_s)$ can only vary over the smaller region at the upper end of the earnings distribution. Given this, the variation in (2) across countries will be driven by variation in $E(y_f)$, so that a model explaining variation in $E(y_f)$ is required.

The model I use is that of Borjas (1987b). Due to differences in the data sets used in that paper and this chapter, the empirical interpretations of the models differ slightly. I will point out the relevant differences at the appropriate place. The Borjas model specifies wages to be distributed in the country of origin (country 0) as follows:

$$\ln w_0 = \mu_0 + \epsilon_0 \tag{2.3}$$

where ϵ_0 is normally distributed $N(0,\sigma_0^2)$. Borjas takes μ_0 to be earnings due to observed socioeconomic characteristics and

ϵ_0 to be earnings due to unobserved characteristics. As the data set used in this chapter only has information on age, sex and marital status by way of "observed socioeconomic characteristics", μ_0 is taken to be average earnings due to those characteristics. The distribution of earnings about μ_0 is then determined by the distribution of ϵ_0, which reflects the distribution of other characteristics in the population such as education, health, innate ability, etc.

Wages in the country of destination (which Borjas labels the U.S. or country 1), were all individuals in country 0 to migrate, are distributed as follows:

$$\ln w_1 = \mu_1 + \epsilon_1 \qquad (2.4)$$

where ϵ_1 is normally distributed $N(0,\sigma_1^2)$. The definitions of μ_1 and ϵ_1 are similar to those of μ_0 and ϵ_0. The correlation coefficient between ϵ_0 and ϵ_1 is ρ. Borjas also takes μ_1 to be the average earnings of U.S. natives by assuming that differences in skills across countries have been standardized. This assumption has strong implications for the interpretations of the selection outcomes which Borjas goes on to derive. While I keep the assumption in this use of the Borjas model, I will point out, where appropriate, its implications.

Given the income distributions in the two countries, the migration decision is determined by the sign of the index function

$$I = \ln\{w_1/(w_0 + C)\} \qquad (2.5)$$
$$= (\mu_1 - \mu_0 - \pi) - (\epsilon_1 - \epsilon_0)$$

where C represents costs of migration and π gives a "time equivalent" measure of these costs. The emigration rate which arises is given by

$$P = Pr[v > -(\mu_1 - \mu_0 - \pi)] \qquad (2.6)$$
$$= 1 - \Phi(z)$$

where $v = \epsilon_1 - \epsilon_0$; $z = -(\mu_1 - \mu_0 - \pi)/\sigma_v$; and Φ is the standard normal distribution function.

This model of the immigration decision can next be used to predict selection outcomes of the immigration process. In order to obtain these predictions the following conditional means are required:

$$E(w_0|I>0) = \mu_0 + (\sigma_0\sigma_1/\sigma_v)(\rho - \sigma_0/\sigma_1)L \qquad (2.7)$$

$$E(w_1|I>0) = E(y_t) = \mu_1 + (\sigma_0\sigma_1/\sigma_v)(\sigma_1/\sigma_0 - \rho)L \qquad (2.8)$$

where $L = \phi(z)/P$ and ϕ is the density of the standard normal.

It can readily be seen from equations (2.7) and (2.8) that the position of immigrants in their home country earnings distribution is determined by whether $\sigma_0/\sigma_1 \gtrless \rho$. Similarly, their position in the host country earnings distribution is determined by whether $\sigma_1/\sigma_0 \gtrless \rho$, again, assuming μ_1 is the mean earnings of both immigrants and the U.S. population. Defining Q_0 to be the earnings differential between the average person and the average emigrant in country 0, Q_1 to be the earnings differential between the average immigrant and the average native in country 1, and $k = \sigma_1/\sigma_0$, three selection outcomes can be identified.

The first selection outcome is "positive selection", whereby $Q_0 > 0$ and $Q_1 > 0$. This is where immigrants come from

the upper end of the home country distribution and are in the upper end of the host country distribution. The necessary and sufficient conditions for this to arise are derived from equations (2.7) and (2.8):

$$\rho > \min [1/k, k] \text{ and } k > 1. \qquad (2.9)$$

The intuition underlying this result is that as long as the ranking of skills is sufficiently similar across countries (i.e. ρ sufficiently large), those in the upper end of the home country distribution will migrate to a country with a greater income spread so as to avoid being "taxed" because of their position in the home country distribution. Those in the lower end of the home country distribution will not migrate to the country with the greater earnings spread because in their home country they are being "insured" against lower earnings. An example of this sort of country is a Western European social democracy with high tax rates and generous social benefits.

The importance of the μ_1 assumption can be seen here. Rather than the average skill level being the same in the home and host countries, suppose the average skill level in the home country is higher. A random draw from this population would produce an immigrant pool that is more skilled on average than the U.S. population. It would be a mistake, however, to see this immigrant group as being the product of the selection process described above.

The second selection outcome which can be identified is "negative selection", whereby $Q_0 < 0$ and $Q_1 < 0$; those in the

lower part of the home country distribution migrate and are located in the lower part of the host country distribution. The necessary and sufficient conditions for this to arise are:

$$\rho > \min [1/k, k] \text{ and } k < 1. \quad (2.10)$$

In this case the low earners can insure themselves against lower earnings by migrating to the country with the narrower earnings spread. The high earners stay where earnings are more spread and avoid the "tax" which would apply were they to migrate. A country with very low marginal tax rates and little provision for those in the lower end of the earnings distribution is an example of a negative selection country.

A violation of the μ_1 assumption, again, has implications for the interpretation of the source of this selection outcome. If a country's population is, on average, less skilled than the U.S. population, its immigrants may be less skilled than the U.S. population. This may be a random outcome, however, and not the result of a selection process driven by differences in inequality.

A third selection outcome is labeled "refugee sorting" and arises when $Q_0 < 0$ and $Q_1 > 0$. In this case, although the immigrants come from the lower part of the home country distribution, they are in the upper part of the host country distribution. The necessary and sufficient condition for this to arise is

$$\rho < \min [1/k, k]. \quad (2.11)$$

The intuition here is that skills valued little in one country may be valued highly in another, thus attracting the migration

of owners of these skills. An example is a communist country which rewards bureaucrats well and entrepreneurs poorly. The remarks made about the μ_1 assumption apply here also.

With an expression for $E(y_f)$ and different potential values outlined, I return to the quantity $E(y_s) - E(y_f)$. This quantity is equal to:

$$[\mu_1 + \delta] - [\mu_1 + (\sigma_0\sigma_1/\sigma_v)(\sigma_1/\sigma_0 - \rho)] \quad (2.12)$$

$$= \delta - (\sigma_0\sigma_1/\sigma_v)(\sigma_1/\sigma_0 - \rho) \quad (2.13)$$

In the case of positive selection, $\sigma_1 > \sigma_0$ and $\sigma_1/\sigma_0 > \rho$. Therefore, the second quantity in expression (2.13) is positive, so the total quantity is less than δ. In the case of negative selection, this same second quantity is negative, so the total quantity is greater than δ. Finally, in the case of refugee sorting, the total quantity is less than δ. The clear conclusion from this is that the difference between the skill-based and family-based immigrants from positive selection and refugee sorting countries will be less than the difference for the same groups of immigrants from negative selection countries. In addition, it is clear from the model that a high degree of earnings inequality leads a country to exhibit negative selection and hence a large difference between its skill-based and family-based immigrants. Similarly, low earnings inequality in other countries leads to positive selection and a smaller difference between the skill-based and the family-based.

In order to see this, consider Figures 1-3. Figure 1 shows two earnings distributions, one for a foreign country

and one for the U.S. In the U.S. earnings are less equally distributed and, following the Borjas model, this foreign country will exhibit positive selection, assuming a sufficiently high correlation between the return to various skills in the two countries. The positive selection comes about because individuals between points A and B in the foreign earnings distribution wish to migrate, and arrive between points A and D in the U.S. distribution.

Notice that for the foreign country in Figure 1, above average quality immigrants will come to the U.S. regardless of whether labor-market characteristics are a criterion for immigration. That being the case, family-based immigrants from a positive selection country will have above average earnings in the U.S., compared to the native population of the U.S. In the diagram the mean earnings of this group is represented by $E(y_f)$. This assumes that these immigrants are responding to economic incentives when migrating and are not migrating for strictly family reasons.

The skill-based immigrants will be located between points C and D in the U.S. earnings distribution, and their mean earnings are represented by $E(y_s)$. The wage premium for the skill-based relative to the family-based immigrants for this positive selection country is then the distance indicated in the figure.

Figure 2 is the negative selection case, with earnings more widely spread in the foreign country than in the U.S. Those who immigrate from the foreign country, in the absence

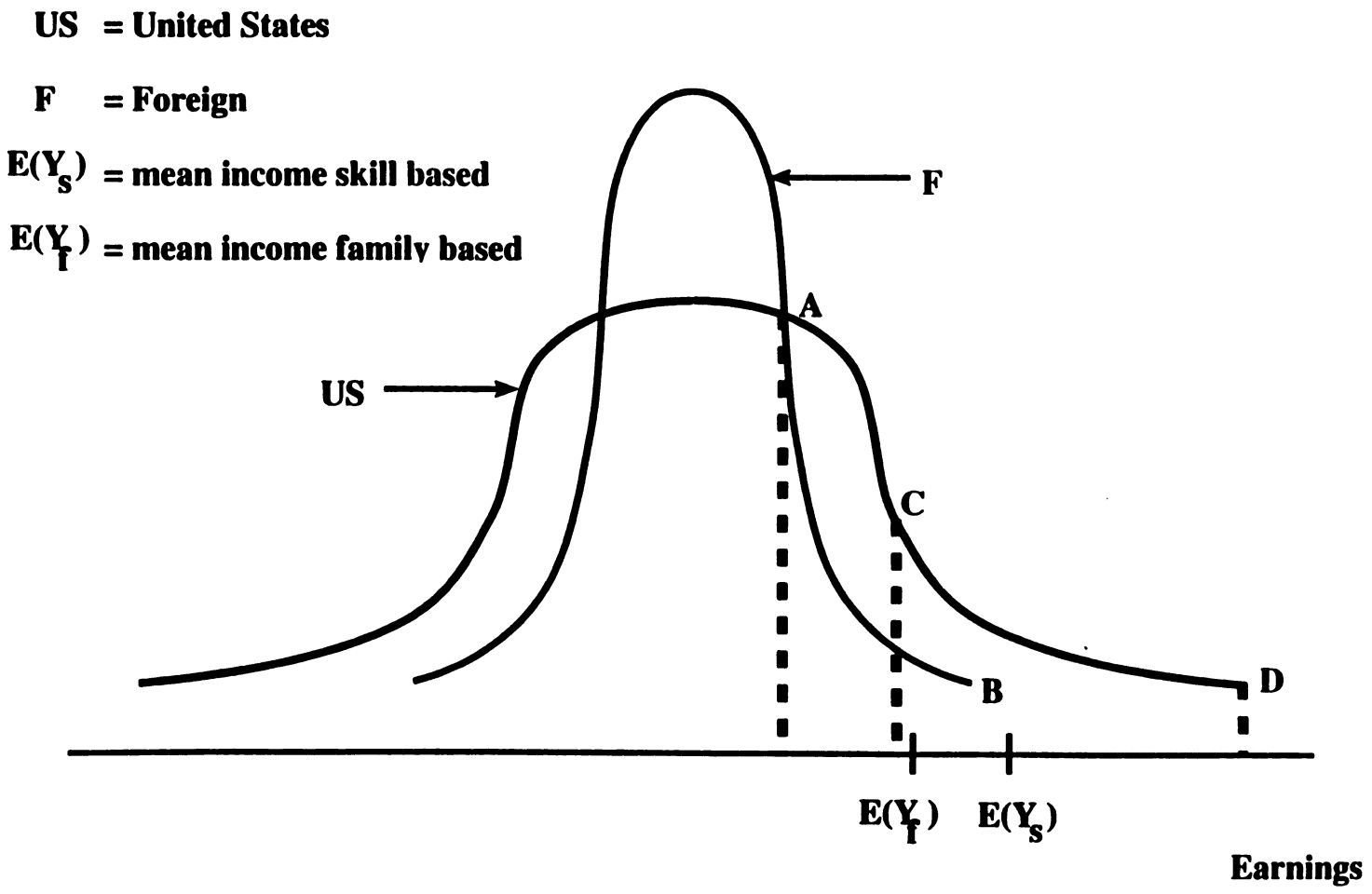

Figure 1. Positive Selection

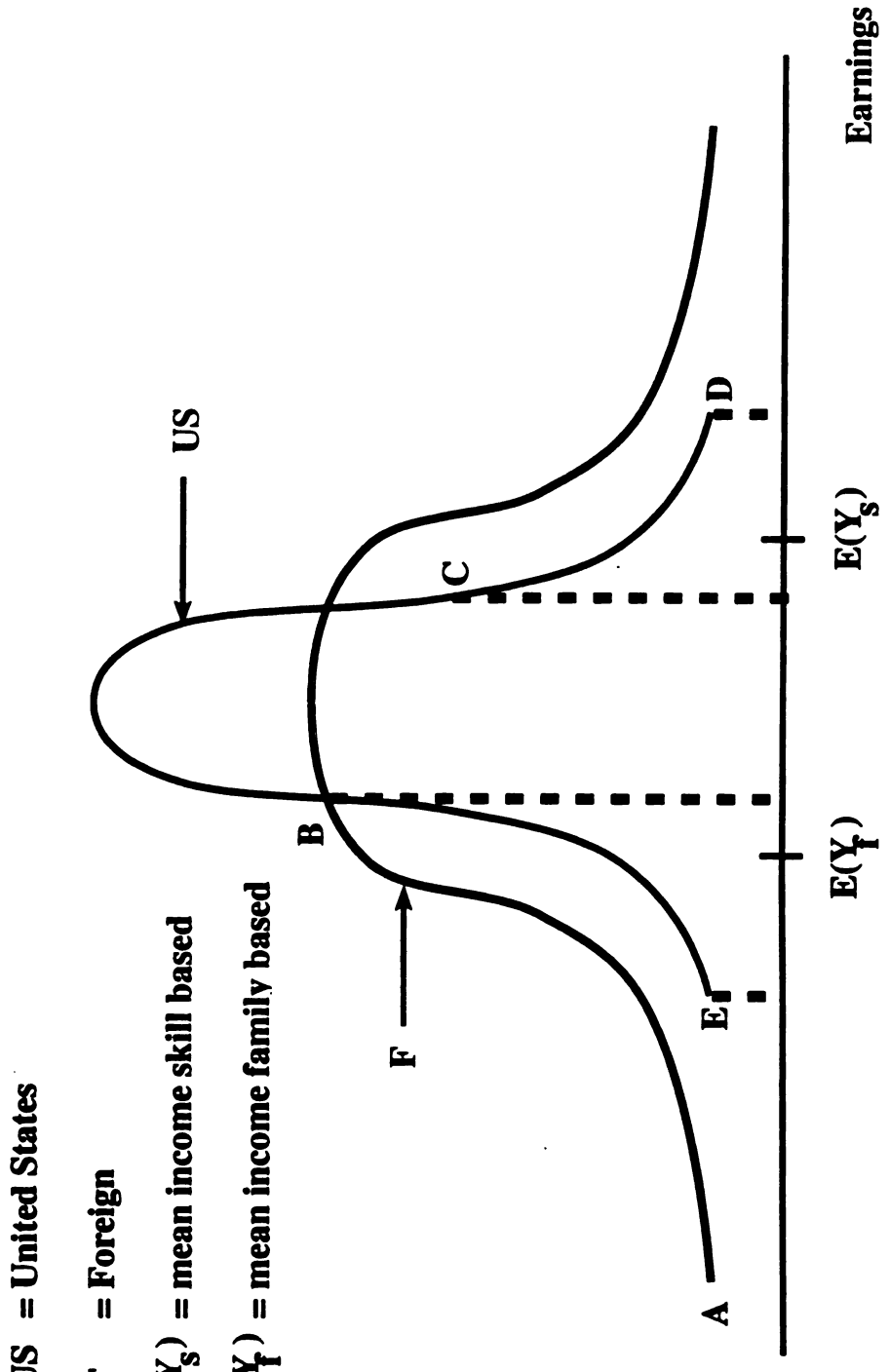

Figure 2. Negative Selection

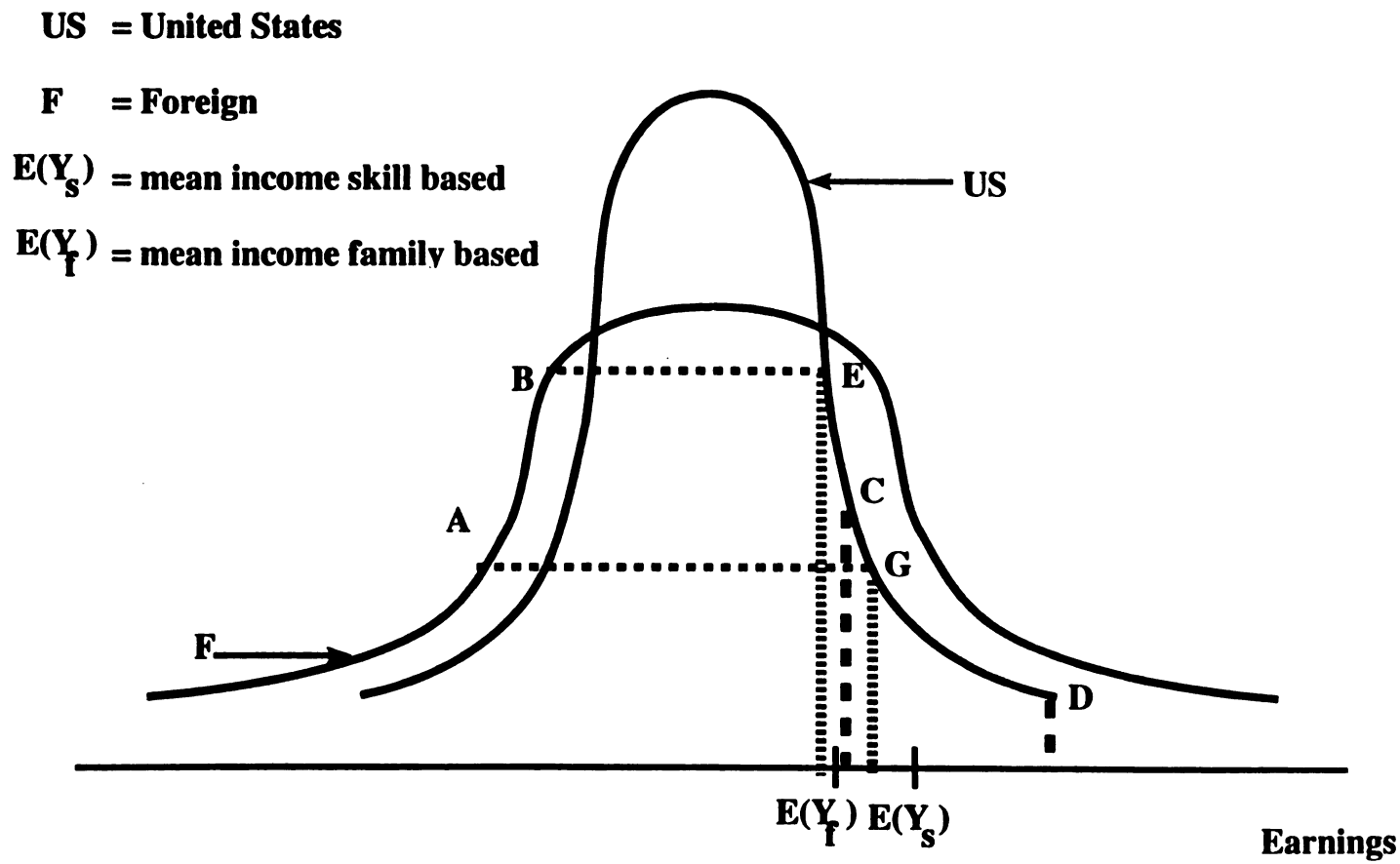

Figure 3. Refugee Sorting

of labor-market immigration criteria, are those in the lower end of the earnings distributions. They are located between points A and B in the home country distribution and arrive between points E and B in the U.S. distribution. Their mean earnings are as shown and are below mean earnings in the U.S. population.

From the theory developed so far it is likely that the numbers of skill-based immigrants from negative selection countries will be small, given that they can earn more in their home country. However, assuming that some will choose to immigrate, their mean earnings should be the same or at least very similar to the mean earnings of the skill-based immigrants of positive selection countries. Hence, they too will be located between points C and D in the U.S. distribution. This being the case, the wage premium for the skill-based relative to the family-based immigrants for negative selection countries should be greater than the corresponding premium for the skill-based immigrants from positive selection countries.

The skill-based versus family-based wage premium in the case of refugee sorting is shown in Figure 3. Those from the lower end of their home country earnings distribution migrate and arrive in the upper end of the host country distribution. This is represented in the diagram as people between points A and B in their own country's earnings distribution moving to the area between points E and G in the U.S. distribution. In this situation the family-based immigrants have mean earnings

above the host country's mean. The skill-based premium is thus similar to the positive selection case and smaller than the negative selection case.

In summary, for positive selection and refugee sorting countries the influence of class of admission on the labor-market quality of immigrants will be less than the influence for negative selection countries. Regardless of the immigration criterion faced, immigrants from positive selection and refugee sorting countries will arrive in the upper end of the U.S. distribution. For negative selection countries, however, immigrants admitted without reference to labor-market quality, i.e., family-based immigrants, will come from the lower end of both their home and the U.S. earnings distributions. Skill-based immigrants from negative selection countries will be in the upper end of the U.S. earnings distribution.

Section 3: Outline of the Empirical Approach

I do the empirical analysis in two stages. The first stage is to determine whether or not across country differences between the family-based and skill-based immigrants exist. I do this by estimating wage equations for a range of countries and including in the regression a dummy variable equal to one if the individual is a skill-based immigrant and equal to zero if they are a family-based immigrant. The coefficient of this dummy variable is then interpreted as measuring the wage premium of the skill-based relative to the family-based immigrants. If the model is

correct this coefficient should vary across countries in a predictable way. The second stage of the testing process will be to determine whether or not any observed variation in the measure of the wage premium of the skill-based is consistent with the theory presented earlier. I do this by regressing the measure of the skill-based premium on some country-specific variables to see if these variables do indeed explain the observed pattern in this premium.

In the first stage I use data from the Immigration and Naturalization Service. Information on all aliens legally admitted to the United States for permanent residence in the fiscal years 1978 to 1980 is available on tape and contains variables such as occupation, class of admission and nationality. Other information such as age, marital status and sex is also contained, as is information on whether the alien is a new arrival in the U.S. or is adjusting to permanent residence from a non-immigrant status.

For aliens admitted on the basis of job skills, the occupation reported is that which they will perform in the United States. The occupation reported for all other aliens is that which they were doing in their most recent country of residence. Those admitted under the skill class of admission would probably practice their particular skill in their own country, so no major inconsistency should arise due to this way of reporting occupation. Use of these data does, however, require the assumption that occupational attainment is highly correlated across countries of origin and the U.S.

I selected males aged 22 to 64 from 41 countries for analysis. Using only males adds credence to treating family-based immigrants as if they are responding to economic as opposed to purely family considerations. The same consideration motivated the omission of the very old. The very young are omitted because the occupations they report will less accurately reflect their true potential labor-market quality. The 41 countries used are those for which country specific data are available.

In order to perform analysis, the occupational variable had to be converted into a wage variable. I did this by imputing earnings for each 3-digit occupation code, using earnings data from the 1980 Census. I matched the median earnings of full-time full-year males in each occupation with the occupation for each individual in the sample.

The equation I estimated for each country is

$$\begin{aligned} \text{LWAGE} = {} & b_0 + b_1\ \text{AGE} + b_2\ \text{AGESQ} + b_3\ \text{MARRIED} + b_4\ \text{D78} + \\ & b_5\ \text{D79} + b_6\ \text{D80} + b_7\ \text{ADJUSTER} + b_8\ \text{YEARS IN U.S.} \\ & + b_9\ \text{SKILL} + b_{10}\ \text{REFUGEE} + e \end{aligned}$$

where LWAGE is the logarithm of the earnings of the occupation reported by the immigrant; AGESQ is age squared; MARRIED is a dummy variable equal to 1 if the individual is married and 0 otherwise; D78, D79 and D80 are dummy variables for each year of admission (the omitted year is 1977); ADJUSTER is a dummy variable equal to 1 if the immigrant was already in the U.S. as a non-resident alien before adjusting to permanent residence and equal to 0 for new arrivals; YEARS IN U.S. is

the number of years spent in the U.S. before gaining permanent residence (it equals 0 for new arrivals); SKILL is a dummy variable equal to 1 if the immigrant gets permanent residence on a skill-based class of admission and 0 otherwise; REFUGEE is a dummy variable equal to 1 if the immigrant gets permanent residence on a refugee based class of admission and 0 otherwise.

The coefficient of greatest interest is that of SKILL. This represents the wage premium of the skill-based relative to the family-based immigrants for each country. The larger the coefficient for a country, the larger is the difference between the skill-based and the family-based immigrants from that country. The theoretical discussion suggests that this should increase with the variance of the home country earnings distribution.

I use AGE, AGESQ and MARRIED as standard socio-economic controls. The year dummy variables, D78, D79 and D80, are added to capture any possible changes in immigrant cohort quality over these years. The variables ADJUSTER and YEARS IN U.S. are intended to capture any possible difference between the position of new arrivals and those who gain permanent residency after having been in the U.S. for a number of years. Finally, I use the variable REFUGEE to control for the experience of refugees who presumably have immigrated for non-economic reasons.

Section 4: Empirical Results, Part 1

Table 2 presents results from a pooled regression of all

41 countries with 40 dummy variables included to represent countries. This equation gives an overview of the value of these coefficient estimates. The table shows that the signs on most coefficients are as expected. The SKILL coefficient shows that on average across countries those admitted on a skilled class of admission are in occupations which pay 32 percent more than the occupations performed by those admitted on a family class of admission. Of passing interest is the negative coefficient on REFUGEE, the refugee dummy variable. That it is significantly different from the family group indicates that the migration motive for this group is truly different from that of other migrants and that they are not merely economic refugees in disguise.

The negative coefficient on the variable YEARS IN U.S. for those adjusting to permanent residency may appear at odds with other results in this area which show a positive relationship between years in the U.S. and immigrant earnings. This apparent conflict is explained by the use of individual wage rates in other studies but occupational wage rates in this study. Individuals may earn more as they spend longer in the U.S. but the occupation they report may place them in the lower end of the earnings distribution. This problem may be particularly relevant for immigrants whose work opportunities were limited by their visa status prior to gaining permanent residency. They may have had to work illegally or, in the case of students, restrict their work time to a small number of hours. In both cases, occupational attainment will be low.

Table 2: Regression which Estimates the Coefficients of the Variables Shown Using Data from all 41 Countries

Dependent Variable: log wage		
Parameter	Parameter Estimate	Standard Error
INTERCEPT	9.364	0.0103
AGE	0.014	0.0005
AGESQ	-0.0001	0.000006
MARRIED	0.019	0.0017
D78	-0.013	0.0023
D79	-0.018	0.0024
D80	-0.019	0.0025
ADJUSTING TO PERMANENT RESISENCY	0.012	0.0022
YEARS IN U.S.	-0.001	0.0004
SKILL	0.323	0.0036
REFUGEE	-0.106	0.0048
Adjusted R^2 = .1858		N=249,102

Note: also included in the regression but not reported here were 40 country dummy variables.

Table 3 contains a limited presentation of the results from the 41 country regressions. It is apparent from the values of the SKILL coefficient that considerable variation does exist across countries. This finding supports the idea that the family-based immigrants from some countries are not too unlike the skill-based immigrants from the same country, while for other countries there is a considerable difference. The low European values such as the Netherlands (.1849) and Sweden (.1662) and the high South and Central American values such as Mexico (.6827) and Haiti (.9090) also give an indication that something systematic may be giving rise to the different outcomes across countries.

Section 5: Empirical Results, Part 2

The regressions presented in Table 4 have as the dependent variable the coefficient of SKILL estimated earlier for each country and reported in Table 3. The first two independent variables reported in Table 4 are intended to reflect economic conditions in the countries of origin. INEQUALITY is the ratio of the income of the top 10 percent of households to the income of the bottom 20 percent of households. It captures the extent of income inequality in the countries of origin. Clearly, given the crucial role of income inequality in the theoretical model, the sign and significance of the estimated coefficients of this variable are of paramount interest.

The second variable which I use to capture the economic conditions in the country of origin is LOG GNP. This is the

Table 3: Estimating the Wage Premium for the Skill-Based Immigrants

Dependent Variable: Log wage				
Country	Skill Coefficient	Standard Error	# Skill-Based	N
Austria	.3451	0.0658	28	293
Czechoslovakia	.2410	0.0889	21	621
Denmark	.2793	0.0592	32	329
France	.3013	0.0395	94	1433
Germany	.2178	0.0262	163	1813
Greece	.4440	0.0481	60	5048
Hungary	.1667	0.0963	11	529
Ireland	.4627	0.0469	65	964
Italy	.4842	0.0375	81	4454
Netherlands	.1849	0.0305	112	1004
Norway	.1973	0.0723	24	336
Poland	.3669	0.0453	47	3022
Portugal	.4643	0.0648	26	6905
Romania	.3287	0.0848	18	1272
Spain	.5479	0.0616	32	1266
Sweden	.1662	0.0388	71	458
Switzerland	.2281	0.0476	58	590
U.K.	.2876	0.0085	1396	16970
U.S.S.R.	.2363	0.0863	13	805
Yugoslavia	.3473	0.0699	25	1495
China	.3540	0.0153	948	13984
Egypt	.1408	0.0271	217	2232
India	.2322	0.0092	2470	15318
Israel	.2588	0.0218	210	3323
Japan	.3638	0.0286	201	2596
Korea	.1273	0.0169	346	13737
Philippines	.3981	0.0178	544	17977
Argentina	.6354	0.0395	86	2458

Table 3 (cont'd):

Dependent Variable: Log wage				
Country	Skill Coefficient	Standard Error	# Skill-Based	N
Canada	.4639	0.0105	1370	12809
Colombia	.4265	0.0436	42	6241
Cuba	-0.0400	0.1489	3	12861
Dominican Rep.	.7028	0.0884	10	13499
Ecuador	.6036	0.0864	10	3817
Guatemala	.7765	0.1136	6	2205
Haiti	.9090	0.0806	14	5246
Jamaica	.4367	0.0566	26	11712
Mexico	.6827	0.0334	62	48691
Panama	.6148	0.1438	5	1397
Trinidad and Tobago	.6447	0.0722	12	3511

logarithm of 1980 per-capita GNP in dollars and is intended to represent the mean income in the countries of origin.

The next three variables are constructed to capture the political conditions in the countries of origin. POLITICALLY COMPETITIVE is a dummy variable equal to 1 if the country had a competitive party system during the entire period 1950 to 1973, and 0 otherwise. RECENT LOSS OF FREEDOM is a dummy variable equal to 1 if the country had a competitive party system at the beginning of the 1950 to 1973 period but did not have one at the end, and 0 otherwise. NUMBER OF ASSASSINATIONS is equal to the number of politically motivated murders or attempted murders of high government officials or politicians in the period 1950 to 1973.

I use these political variables to capture empirically the theoretical conditions which give rise to refugee sorting. Countries without competitive party systems and with political unrest are more likely to be countries which reward skills differently than does the U.S. Returning to the example used earlier, one can think of a communist state in which a bureaucrat is well compensated while an entrepreneur is not.

The next variable used in the regressions presented in Table 4 is ENGLISH. It is measured as the fraction of the 1975-1980 immigrant cohort from each country that speaks English well or very well. The ENGLISH variable is included because of the findings in other studies that it plays an important role in determining labor-market outcomes for immigrant groups [McManus et al. (1983) and Borjas (1987b)].

The next variable is DISTANCE, measured as the number of air-miles between the country's capital and the nearest U.S. gateway of New York, Miami or Los Angeles. I include this variable to reflect costs of migration and because it has been found to have an important effect on migration decisions and outcomes (Schwartz 1973). This variable is meant to capture both the pecuniary and the psychic costs of immigration. The pecuniary costs are picked up through the more expensive travel from more distant locations. The psychic costs arise from the greater difficulty of returning home for visits, the lower likelihood of visits from friends and family and the greater likelihood of cultural differences. The DISTANCE variable can also be viewed as a proxy for information available to potential immigrants, further distances being associated with less information.[1]

The final variable I include is HIGHER EDUCATION and is equal to the percentage of the population aged 20 to 24 that is enrolled in higher education. This variable is included to deal with the issues associated with the violation of the assumption of standardized skills across countries. As I pointed out when discussing the three selection outcomes, it could be that a small difference between the family-based and skill-based immigrants is simply the result of the family

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[1] Most of the data used in this section of the paper were provided by George Borjas. A description of his sources can be found in Appendix 1. The values of HIGHER EDUCATION were taken from the World Development Report of 1982.

immigrants being drawn randomly from a highly skilled population as opposed to the systematic selection process described in the model. This variable will measure the skill level of the group most likely to migrate and so will control for the the effect I describe, to a limited extent. This variable does not, however, control for the average level of skills in the population of the home country. As such, I can not claim to have fully accounted for differences in skill levels across countries and the results should be considered in this light.

The regressions presented in Table 4 are weighted least squares regressions, because the dependent variable is a coefficient estimate from an earlier set of regressions. The variance of the dependent variable will differ across observations because these are coefficient estimates. In order to correct for this I weighted the observations by the inverse of the standard errors of the SKILL coefficient estimates from the earnings equations.[2]

As I noted earlier, the sign and significance of the variable INEQUALITY are of great importance if the results are to be interpreted as giving support to the Borjas model from this new perspective that I have developed. In all four models INEQUALITY is significant, and the positive sign is as predicted. According to the model, negative selection is a result of high income inequality, which should in turn lead to

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[2] I would like to acknowledge the advice provided to me on this point by Jeff Wooldridge.

a big difference between the family-based and skill-based immigrants from such a country. Similarly, low income inequality is associated with positive selection and, by extension, is likely to lead to a smaller difference between the skill-based and family-based immigrants. Hence, the relationship between INEQUALITY and the measure of the skill-based premium should be positive, again, assuming μ_1 is the mean earnings of both immigrants and the U.S. population.

The coefficient on the variable LOG GNP is positive in each of the three models and is significant in two of them. This means that a higher mean income in a country tended to lead to a greater difference between the family-based and skill-based immigrants. Such a result may strike some as being counter-intuitive if the assumption held is that higher mean incomes are associated with positive selection and hence a smaller difference between family-based and skill-based immigrants. The theoretical model does, however, allow for such a result. A higher mean income reduces the average quality of immigrants from a negative selection country by removing from the group the most skilled. As such, the family-based mean income is dragged further away from the mean. (A further explanation of this point can be found in Appendix 2).

As can be seen from the adjusted R^2 of Model 1, the two economic variables alone explain almost 30 percent of the variation in the wage premium measure. I take this to be reasonably impressive and quite satisfying, especially when combined with the results for the INEQUALITY variable.

Table 4: Using Country-Specific Characteristics to Explain the Variation in the Coefficient of SKILL

Dependent Variable: Coefficient of SKILL from Table 3				
Variable	Model 1	Model 2	Model 3	Model 4
INTERCEPT	-0.1717 (0.1844)	-0.2474 (0.2277)	0.3375 (0.2268)	0.1595 (0.2911)
INEQUALITY	0.0233 (0.0056)	0.0222 (0.0057)	0.0129 (0.0051)	0.0146 (0.0057)
LOG GNP	0.0439 (0.0199)	0.0572 (0.0247)	0.0272 (0.0222)	0.0456 (0.0322)
POLITICALLY COMPETITIVE	-	-0.0649 (0.0494)	-0.0089 (0.0576)	-0.0373 (0.0706)
RECENT LOSS OF FREEDOM	-	-0.0036 (0.0712)	0.0545 (0.0661)	0.0212 (0.0857)
NUMBER OF ASSASSINATIONS	-	0.0031 (.0059)	0.0112 (.0051)	0.0152 (0.0063)
ENGLISH	-	-	0.2196 (0.1153)	-0.1621 (0.1358)
DISTANCE	-	-	-0.0392 (0.0105)	-0.0368 (0.0121)
HIGHER EDUCATION	-	-	-	-0.0015 (0.0035)
Adjusted R^2	.2792	.2619	.5167	.5081

(Standard errors are in parentheses; N for models 1-3 = 41, N for model 4 = 37.)

I add the political variables in Model 2. The only one which is significant in any of the models is NUMBER OF ASSASSINATIONS. A possible interpretation of the positive coefficient is as follows: a country may experience political unrest if income inequality is large in that country; but income inequality is precisely the factor which leads to negative selection and a large wage premium for skill-based immigrants relative to family-based. In this way, the positive coefficient on NUMBER OF ASSASSINATIONS makes sense. I would suggest that the negative coefficient on POLITICALLY COMPETITIVE is a result of the correlation of lower income inequality and politically competitive systems in Western Europe.

The addition of ENGLISH and DISTANCE in Model 3 increases the explanatory power quite dramatically, bringing the adjusted R^2 to .52. That ENGLISH is significant, albeit at the 90 percent level, is consistent with work referred to earlier. Its negative sign makes sense when one considers the different impact English language skills have across skill groups. A country whose immigrants have, on average, low English-language skills is more likely to have a large group of low-skilled immigrants among the family-based immigrant group. This is because the lack of good English skills will be less of a penalty for low-skilled than for high-skilled workers. Such a country will therefore exhibit a big difference between the skill-based and family-based immigrants. This explains the negative relationship between English language skills of the

immigrant population and the wage premium for the skill-based immigrants.

That the coefficient on the DISTANCE variable is significant and negatively signed is also consistent with other work (Schwartz 1973). The negative sign indicates that the further away a country is, the smaller will be the wage premium for the skill-based relative to the family-based immigrants. In other words, the further away is the country in question, the higher is the quality of the family-based immigrants. DISTANCE is being used to get a handle on costs, so I will consider first the pecuniary cost argument. The further away the country, the higher is the cost of transport to the U.S. As such, the greater will be the resource constraint for potential immigrants from further away places. Only those who can overcome this constraint can immigrate from far-away places, i.e., the high earners or the high- skilled. From the psychic cost perspective, it can be argued that the greater the distance, the greater are the psychic costs. If it is the case, though, that psychic costs are lower for high-skilled people, these will be less of a deterrent for them. The family-based immigrant group from far away places will then have a higher concentration of high-skilled people, and this will reduce the premium.

The final point to be made on the DISTANCE variable concerns the information argument. The further away a country is, the lower is the level of information about the U.S. However, deficient information is likely to be less of a

problem for high-skilled people, given education, professional contacts, etc. This, once again, leads to a situation in which the family-based immigrant groups from far-away countries lose a number of lower-skilled immigrants, thus raising the average quality of the family-based group and lowering the skill-based wage premium.

The addition of HIGHER EDUCATION in Model 4 does not alter the significance of the INEQUALITY coefficient, so the idea that the SKILL coefficient is merely a product of the distribution of skills in a country is not supported. The only effect of the HIGHER EDUCATION variable is to reduce the significance of the ENGLISH coefficient. This is hardly surprising, since a high correlation should exist between the level of education in a country and the English language ability of its people. This variable does not, however, measure average skills in the populations of the home countries, so it is still possible that the distribution of skills plays a role in determining the SKILL coefficient.

Section 6: Summary and Conclusion

The first finding in this chapter is the variation across countries in the difference in labor-market quality between the skill-based and family-based immigrants. This supports the idea that the underlying national framework, in which individuals make migration decisions, influences the nature of the immigrant group from that country. The second finding, and the more interesting one, is that income inequality in the sending country has an influence on the make-up of the

immigrant group, a finding that gives support to the Borjas model. Additional evidence has also been found which indicates the importance of distance and English language skills in determining the quality of immigrants.

Some tentative policy lessons can be drawn. It may be thought that an immigration policy that does not use labor-market characteristics as immigration criteria will lead to the immigration of the low-skilled. The analysis here indicates that for some countries such as Sweden, with its SKILL coefficient of .1662, and the Netherlands, with its SKILL coefficient of .1849, such a view is untrue. For these countries, the absence of labor-market immigration criteria does not lead to an inflow of unskilled people. Rather, the immigrants from these and other similar countries will tend to be of higher quality regardless of immigration criteria. Restricting immigration from such countries does not keep out the low-skilled, against whom so much anti-immigration rhetoric is directed. Instead, it keeps out the relatively high-skilled.

For other countries, the absence of labor market criteria in immigration policy does lead to the influx of the low-skilled. The Mexican SKILL coefficient of .6827 shows how far below the skill- based immigrants Mexican family-based immigrants are. A policy which favors the immigration of those from negative selection countries will lead to a pool of immigrants with less desirable labor-market characteristics.

If the labor market objective of immigration policy gains

precedence over the family re-unification objective, then the need for labor market criteria for negative selection countries is clear. For positive selection countries, however, such criteria appear to be less necessary in an effort to restrict immigration to the high-skilled. Whatever the objective of immigration policy one point seems clear; the effect of immigration policy across countries will differ because of the different nature of the potential immigrant groups from each country.

Chapter 3

Evidence on Immigrant Selection from the Greencard Lottery Winners

Section 1: Introduction

Since 1987 the U.S. State Department has run a series of lotteries in which the prizes are permanent residency in the United States. Citizens from various countries could enter these lotteries by simply sending a piece of paper with their name, address and one or two other details to a post office box. From the pile of entries, the winners are randomly drawn and informed that they are eligible for permanent residency.

The lotteries came about because of the shift in the national origin mix of immigrants to the United States in the last 20 to 25 years. The decline in the numbers coming from the former "Old World" countries means that these countries do not "have access to immigration channels primarily because sponsorship links have been depleted".[1] The purpose of the lotteries is to provide a quick and simple way "to promote diversification in (the) legal immigration system". This is done by restricting the lotteries to citizens of countries "that have sent the United States relatively few immigrants over the past several years".

The first lottery was authorized by the Immigration Reform and Control Act of 1986. This act provided for the issuance of 5,000 greencards through lottery in each of 1987

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[1] Quotes in this paragraph are taken from House of Representatives, Report 100-1038

and 1988. This was later extended by the Immigration Amendments of 1988 to 15,000 in each of 1989 and 1990. The Immigration Amendments of 1988 also set up a second program to distribute 10,000 visas in each of 1990 and 1991. A third lottery program was established under the Immigration Act of 1990 which provided for the issuance of 40,000 visas in each of 1992, 1993 and 1994.

This chapter exploits this natural experiment in immigrant selection. Prior to the lotteries, immigrants coming to the United States were not a random sample of people in a country who wanted to migrate. In order to migrate their desire to migrate had to be supported by the legal ability to do so. In practical terms only those with close family ties in the U.S., those with highly sought skills or refugees could immigrate. The resulting pool of immigrants did not necessarily give a complete and unbiased picture of those who wanted to migrate, although economists have studied them as if they did.

The lottery immigrants are, however, a random draw from the pool of people in a country who want to migrate. In this chapter I develop a model to show how the relative skill levels of lottery-winning and family-based immigrants provide us an insight into the nature of the pool of people in a particular country who want to immigrate into the United States. I then show how the relative shapes of the income distributions in the U.S. and a sending country will influence the relative skill levels of lottery and family immigrants. I

then examine the actual relative skill levels of lottery and other immigrants from a range of countries to determine if there is support for the model, using data from the Immigration and Naturalization Service. Finally, I consider the locational choices of different immigrant groups to see if there is evidence supporting one of the model's assumptions.

Section 2: The Model

In this section I develop a model which will help to predict how lottery immigrants may differ in labor-market quality from immigrants who gain admission into the United States through family contacts. It will show how the relative skill levels of the two groups can provide insight into the nature of the potential immigrant pool from a country.

When choosing whether or not to migrate to a particular country people compare their utility levels in the two countries. Having adjusted for the costs of migration, they choose the location in which utility is maximized. In this model, utility comes from two sources; wages and the presence of family. Denoting the utility from wages as w and the utility from the presence of family as f, the decision on whether or not to migrate is based on the comparison:

$$w_1 + f_1 - c \gtrless w_0 + f_0.$$

The subscript 1 means a value in the U.S., and 0 means a value in the home country. The person will want to migrate if the argument on the left is greater, i.e., if utility in the U.S. less the cost of migration is greater than utility at home.

Consider this comparison for a person with close family

in the U.S. who can gain entry into the U.S. through sponsorship by these family members. Assume that the value of f for this person is positive in both the U.S. and in the home country. The subscript r is used to denote a family immigrant, i.e., an immigrant who is sponsored by relatives. This person will choose to migrate if

$$w_{r1} + f_{r1} - c > w_{r0} + f_{r0}.$$

For the marginal family immigrant this will be an equality:

$$w_{r1} + f_{r1} - c = w_{r0} + f_{r0}.$$

If we assume that the utility from family is the same in both the home country and the U.S. for family immigrants, i.e. $f_{r1} = f_{r0}$, then for the marginal family immigrant:

$$w_{r1} - c = w_{r0}.$$

This says that the marginal family immigrant will want to migrate as long as no pecuniary loss is suffered. The loss in utility through leaving family in the home country is offset by the gain in utility from the presence of family in the U.S. The slightest monetary gain will lead to migration. (While this assumption on family utility may appear extreme, all the results hold once there is greater utility from the presence of family for family immigrants relative to lottery immigrants.)

Now consider an immigrant without these sort of family contacts who can only immigrate through the lottery. For such an individual assume that the utility from family is 0 in the U.S. and positive at home. If the subscript 1 is used to denote lottery immigrant, the following holds for the marginal

lottery immigrant:

$$w_{l1} - c = w_{l0} + f_{l0}$$

or $$w_{l1} - c > w_{l0}.$$

This says that for the marginal lottery immigrant wages in the U.S. less costs of migration will have to be greater than wages at home to compensate for the loss in utility from being away from family.

The next issue is how this difference between the two groups on the margins of immigration will affect their relative labor market quality. Consider first a situation in which all in a country have a monetary incentive to migrate. This could arise when the mean income in a country is so far below that of the U.S. that all could improve their wages, adjusting for the cost of migrating, by moving to the U.S. In such a situation, all those with family ties will choose to immigrate. They improve their utility by improving wages, without losing utility from the presence of family. Hence, the average labor-market quality of the family group will be the same as the average labor-market quality in the population of the sending country.

The situation for those without family ties, the lottery group, is different. As stated earlier, only those who will receive a pecuniary gain sufficient to compensate for the loss of family will migrate. To see how the dispersion of wages in the home country will influence who immigrates through lottery, consider Figures 4(a) and 4(b). These figures show the distribution of earnings in the home country and in the

U.S., were all to migrate to the U.S. In 4(a) income is more equally distributed in the home country relative to the U.S. In this case the greater financial gain from migration accrues to those at the upper end of the earnings distribution. This can be seen in the greater distance between the potential earnings in the two locations for upper-income individuals relative to lower income people. This greater earnings gain produces a greater probability that upper-income people will gain sufficiently from migration to compensate for the loss of family and will thus be more prepared to migrate through lottery. In this situation the lottery immigrants will be more skilled than the family immigrants.

In Figure 4(b) earnings are more equally distributed in the U.S., so the distance between the home earnings and the U.S. earnings is greater for those at the lower end of the distribution relative to those at the upper end. As such, 4(b) shows a situation in which the greater financial gain from migration accrues to individuals in the lower end of the earnings distribution. The lottery group will be less skilled than the family immigrants, since the lottery group is selected from those with the greatest financial incentive to migrate and the family group is selected from across the full range of the earnings distribution.

Now consider the situation in which the means between the two countries are sufficiently similar that not all have a monetary incentive to migrate. As discussed in Chapter 2, two

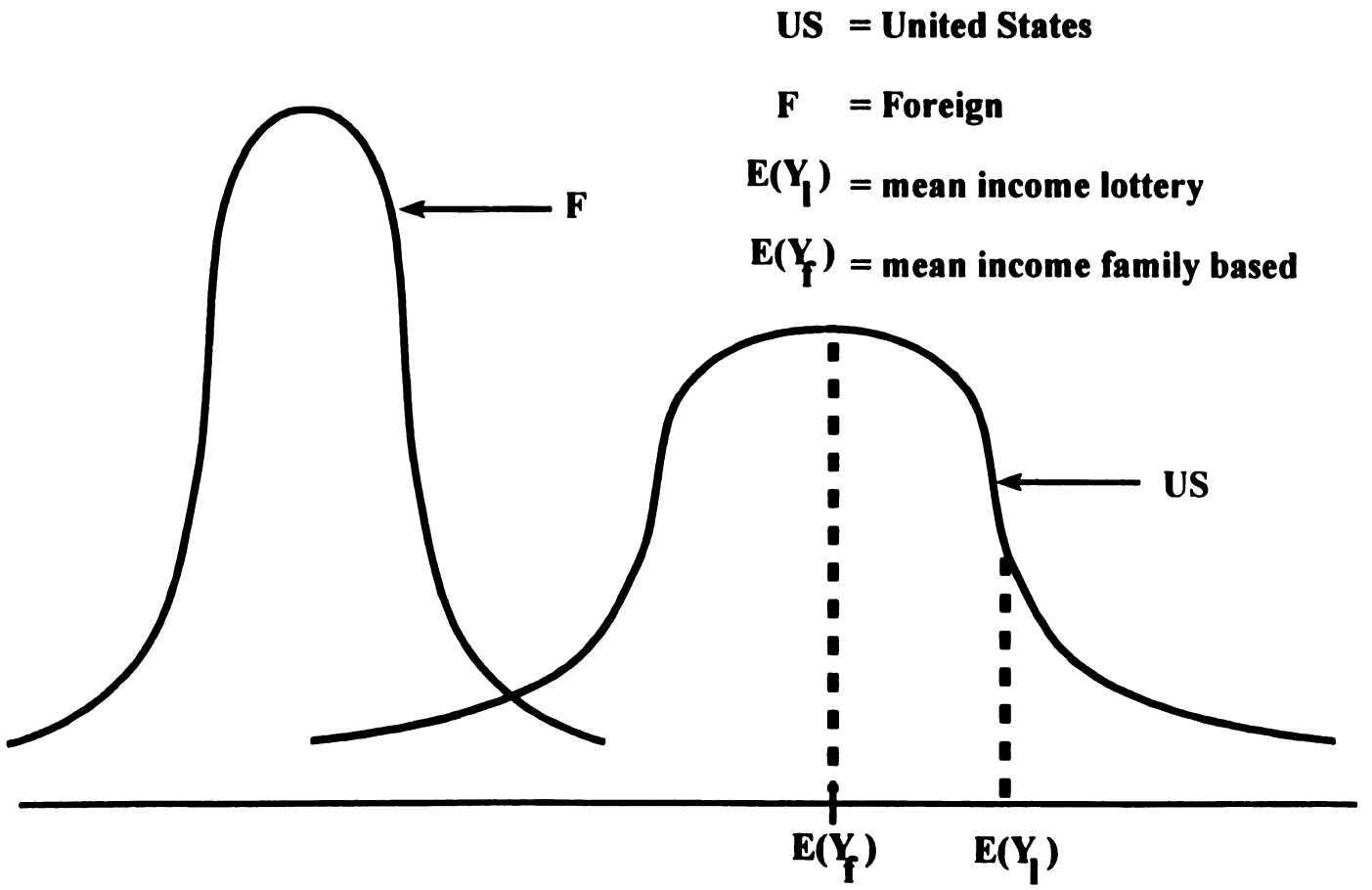

Figure 4A. Lottery Immigrants with Different Means and Smaller Foreign Country Income Variance

US = United States

F = Foreign

$E(Y_l)$ = mean income lottery

$E(Y_f)$ = mean income family based

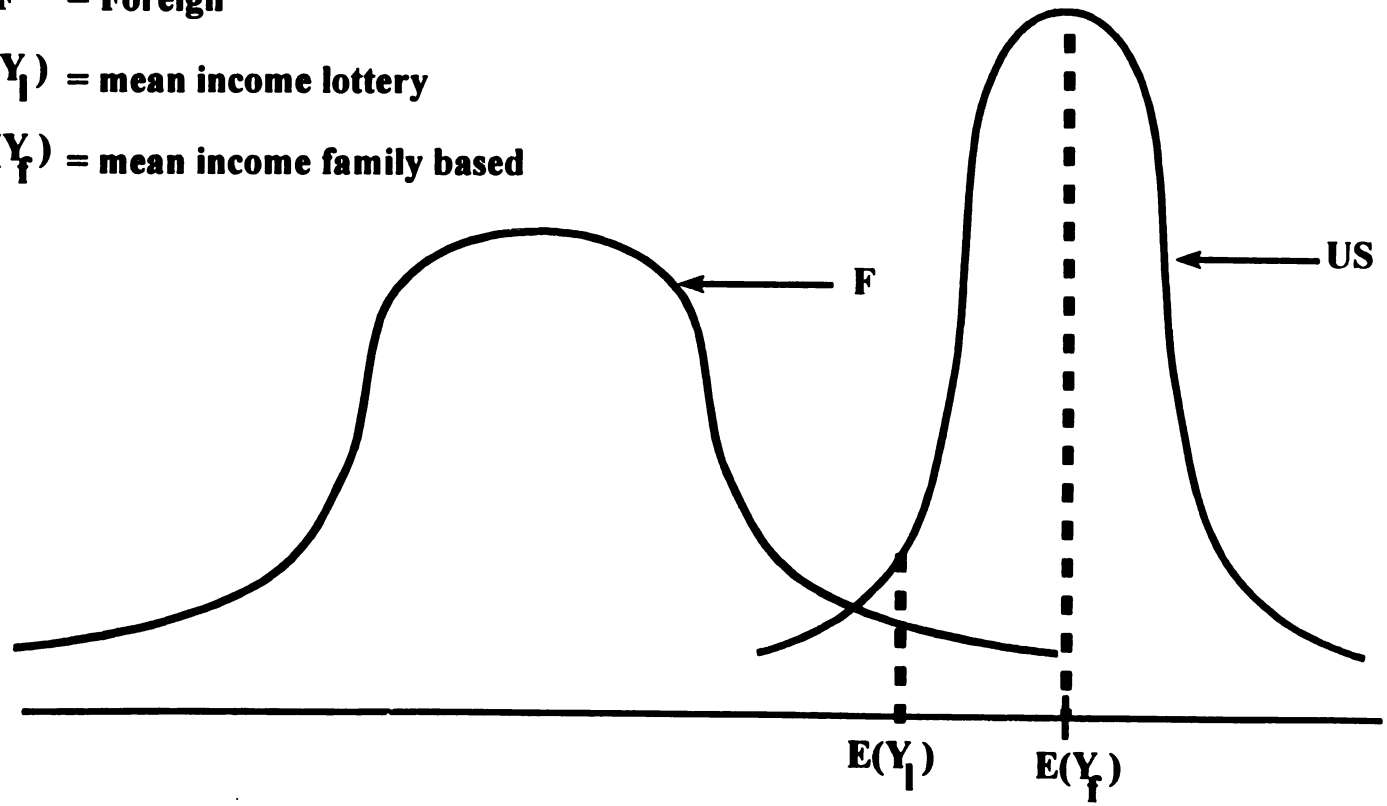

Figure 4B. Lottery Immigrants with Different Means and Bigger Foreign Country Income Variance

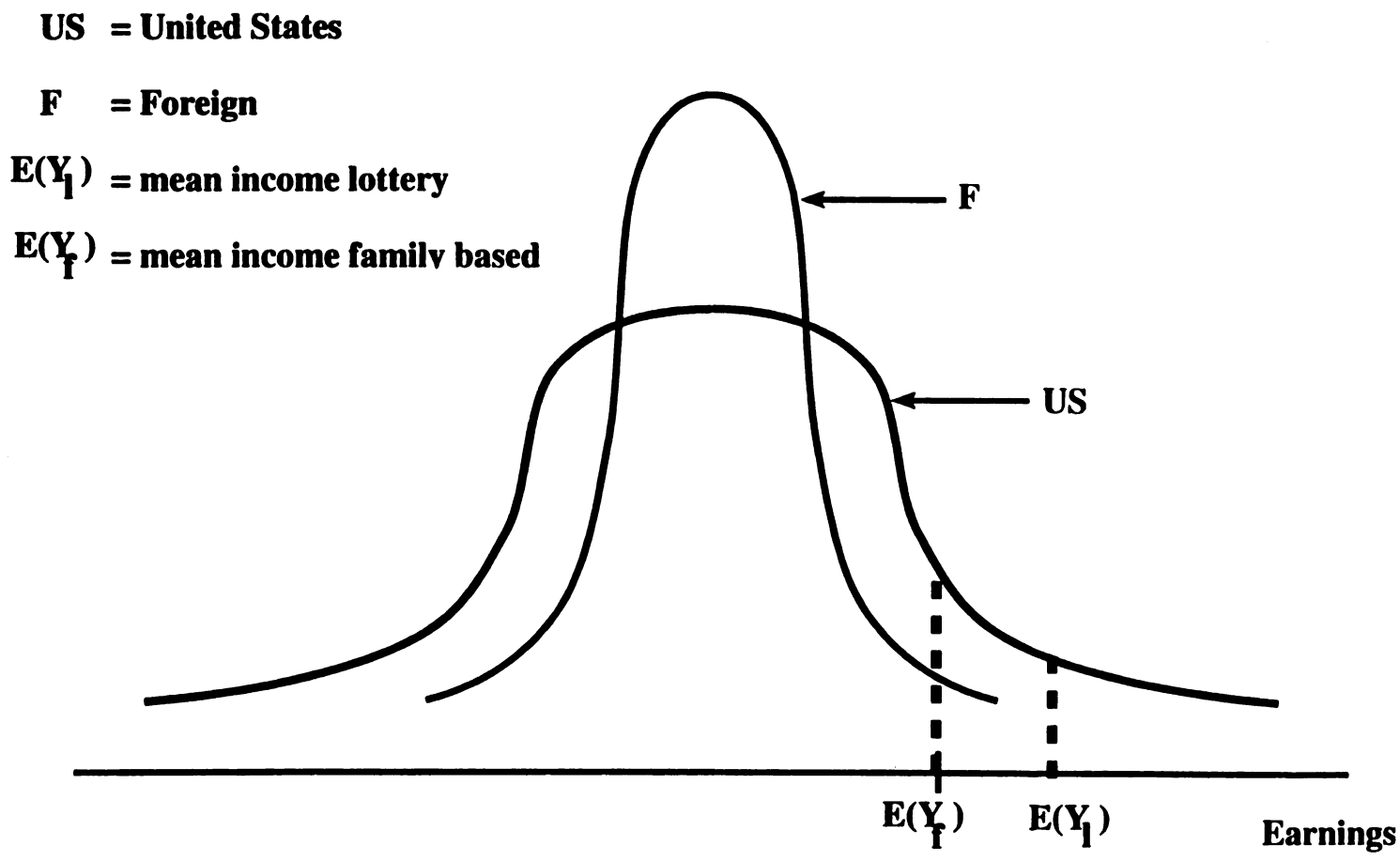

Figure 5. Positive Selection and Lottery Immigrants

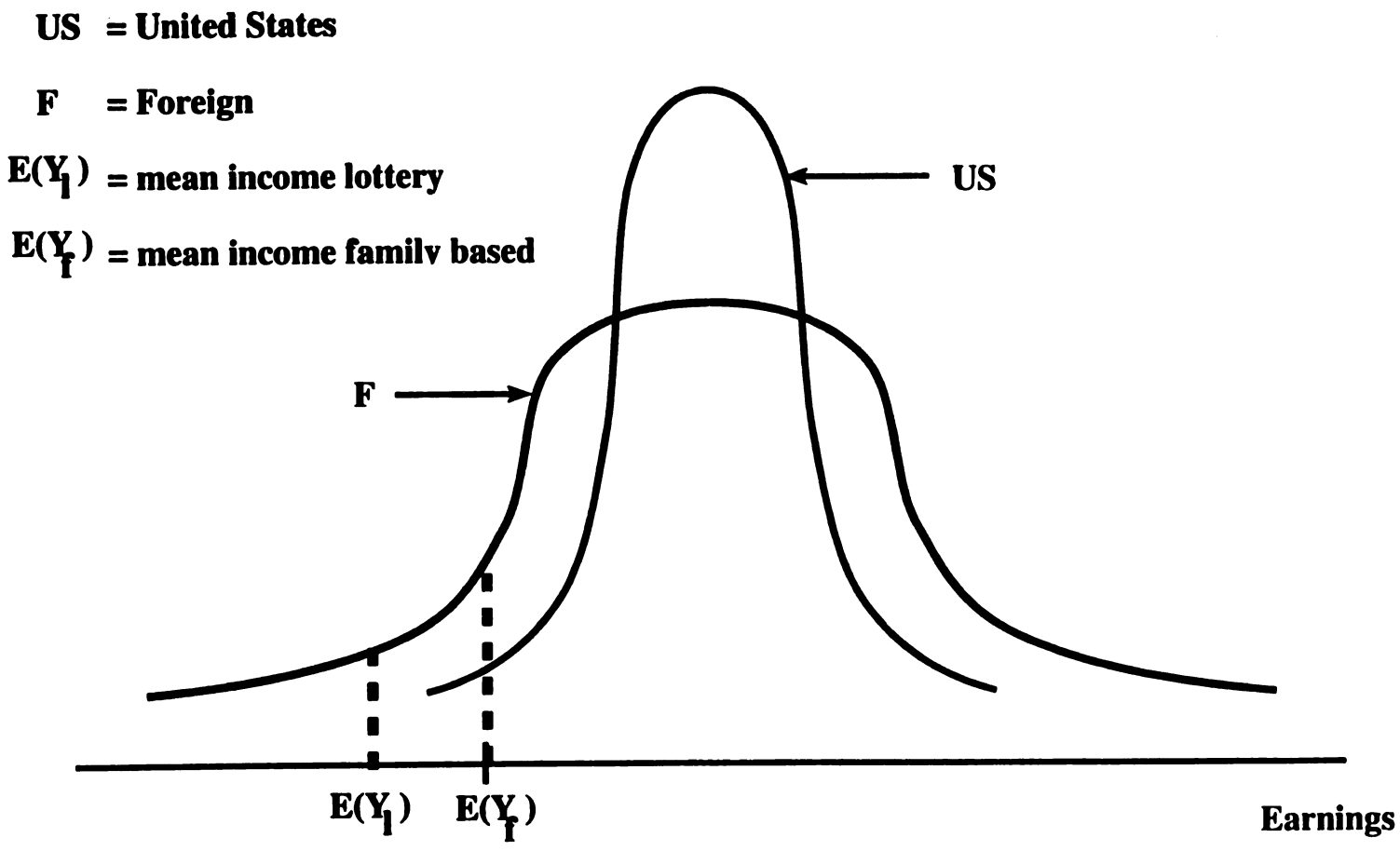

Figure 6. Negative Selection and Lottery Immigrants

selection possibilities exist, positive and negative.[2] Consider first the positive selection case which is drawn in Figure 5. Note that wages are more unequally distributed in the U.S. Immigrants come from the upper end of the earnings distribution. In the case of the lottery immigrants, only those who get a sufficient monetary benefit will choose to immigrate, so the area from which this group is selected is even more skilled than would be the case if only the monetary incentive to immigrate was being considered.[3]

Among the family immigrants all those who make the slightest pecuniary gain from migration will migrate. As the family group comes from a wider range of the distribution than do the lottery immigrants, the lottery immigrants from such a country should be more skilled than the family immigrants.

Now consider the case of negative selection, as shown in Figure 6. The monetary gainers here are located at the lower end of the distribution. The lottery immigrants will come from this end of the distribution but the cutoff will be at a lower level than would be the case if only monetary considerations were involved. Family immigrants also come from the lower end, but the cutoff will be at a higher level than the cutoff for the lottery immigrants. Again, even the slightest pecuniary gain will bring about the migration of the family immigrants

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[2] The third selection outcome, refugee sorting, is omitted to keep the analysis more compact.

[3] The intuition here is based on the model of George Borjas, A.E.R. 1987

since no compensation for loss of family is required. In this situation the model suggests that the family group will be more skilled than the lottery group.

To summarize the model so far, lottery and family immigrants differ in their migration decisions because of the utility derived from the presence of family. Lottery immigrants leave family and must be compensated in order to make migration attractive. Family immigrants substitute the family members in the home country for the family members in the U.S. so no such compensation is required.

The relative labor market quality of lottery and family immigrants depends on which individuals in a country achieve the greatest pecuniary gain from migration and hence the compensation sufficient for them to leave their families. The lower is the level of inequality in the home country relative to the host, the more likely it is that the lottery immigrants come from the upper end of the income distribution and are more skilled than the family immigrants.

Section 3: Estimating the Lottery/Family Wage Differential

In this section I estimate the labor-market quality differences between the family-based and lottery-winning immigrants from nine countries. The data are from the Immigration and Naturalization Service and include all immigrants legally admitted to the United States between 1988 and 1990, except for those admitted under the amnesty program of IRCA. For each individual the data include occupation performed in the country of last residence, nationality, age,

sex, marital status and class of admission, i.e., family, lottery, skill etc. I assigned a wage to each immigrant by matching their occupations with the occupational median weekly earnings of full-time wage and salary workers from Employment and Earnings (January 1990). Although the I.N.S. data include all those legally admitted, I include only males aged 22 to 64 in these regressions. The wage data I use are thus male earnings. I selected the nine countries on the basis of their large representation among the lottery winners. Together they account for over 80 percent of the lottery winners in this age/sex category.

In order to estimate the skill difference between the family and lottery immigrants I estimate wage equations which include a dummy variable equal to one if the individual is a lottery immigrant and zero otherwise. A dummy for those who were admitted on the basis of their skills is also included. As family-based immigrants are the omitted class, the coefficients on the lottery and skill dummy variables can be interpreted as the wages of these groups relative to those of the family immigrants.

The results of the regressions are presented in Table 5 along with an inequality measure for each country. The inequality measure is the ratio of the income of the highest 10 percent to that of the lowest 20 percent and is taken from the World Development Report of 1993. As described in Chapter 2, the size of the coefficient on the skill dummy variable can be taken as an indicator of whether each country exhibits

Table 5: Regressions Estimating the Lottery/Family Wage Differences for Lottery Winning Countries

Variable	Canada	Poland	Bangladesh	Indonesia	Pakistan	Japan
INTERCEPT	5.748 (0.0386)	5.752 (0.049)	5.580 (0.117)	6.439 (0.131)	5.82 (0.073)	5.48 (0.101)
AGE	0.023 (0.002)	0.014 (0.003)	0.027 (0.006)	-0.013 (0.007)	0.022 (0.004)	0.020 (0.005)
AGE SQUARED	-0.0003 (0.00003)	-0.0002 (0.00003)	-0.0003 (0.00008)	0.0002 (0.00008)	-0.0002 (0.00005)	-0.0002 (0.00007)
MARRIED	0.010 (0.007)	0.031 (0.008)	-0.027 (0.019)	0.004 (0.021)	-0.064 (0.013)	0.173 (0.013)
SKILL	0.307 (0.008)	0.496 (0.021)	0.405 (0.029)	0.369 (0.029)	0.337 (0.021)	0.383 (0.016)
LOTTERY	0.120 (0.007)	0.104 (0.010)	0.028 (0.018)	0.115 (0.019)	-0.052 (0.021)	0.116 (0.016)
Adj.-R^2	0.1440	0.0873	0.1159	0.1199	0.0633	0.3182
N	12899	7977	2026	1275	5172	3112
Lottery Immigrants	2498	964	747	708	346	499
Inequality Measure	4.23	2.35	2.59	3.21	3	2.57

Table 5 (cont'd):

Variable	Ireland	Argentina	Ejypt
INTERCEPT	6.03 (0.042)	5.714 (0.096)	5.599 (0.112)
AGE	0.0036 (0.002)	0.023 (0.005)	0.036 (0.006)
AGE SQUARED	-0.00003 (0.00003)	-0.0003 (0.00006)	-0.0004 (0.00007)
MARRIED	0.01 (0.006)	0.006 (0.018)	-0.180 (0.017)
SKILL	0.414 (0.02)	0.343 (0.022)	0.249 (0.027)
LOTTERY	0.044 (0.008)	0.170 (0.022)	-0.041 (0.026)
Adj. R^2	0.0294	0.144	0.099
N	14586	2076	2904
Lottery Immigrants	12151	205	220
Inequality Measure	3.49[a]	8[a]	5.7[a]

a: this figure is taken from an earlier edition of the World Development Report.

positive or negative selection. A large value indicates a big difference between the family-based and skill-based immigrants, so the bulk of the country's immigrants come from the lower end of the distribution, i.e., negative selection. A small difference between the family-based and the skill-based immigrants means that the bulk of a country's immigrants come from the upper end of the distribution, i.e., positive selection. In order to put the inequality measure and SKILL coefficient into context, note that the value of the inequality measure for the U.S. is 5.319 and the average value of the skill coefficient from 38 countries (as reported in Chapter 4) is .3522.

Of the nine countries that are examined six have LOTTERY coefficients that are positive and significant. Five of these six have inequality measures that indicate lower levels of inequality than the United States so these five alone support the ideas in the model. The sixth country however, Argentina, has a greater level of inequality, which runs counter to the predicted effect.

The only other country that has a level of inequality greater than that of the United States is Egypt. While its LOTTERY coefficient is insignificant at conventional levels, it is negative. This gives some support to the model, but the size of the SKILL coefficient erodes this support. I predicted that a country with a high inequality level will have a negative LOTTERY coefficient but also a large SKILL coefficient. Since Egypt has the lowest SKILL coefficient, its

values of the SKILL and LOTTERY coefficients are contradictory by the logic of the model. The small SKILL coefficient indicates that the family immigrants are relatively highly skilled, so the lottery immigrants must be relatively highly skilled also.

The negative LOTTERY coefficient of Pakistan is also contrary to the predictions of the model. Pakistan has a lower level of inequality than the U.S. so the model predicts that its lottery immigrants should be more skilled than the family-based immigrants. This result, along with those of Argentina and Egypt, leaves the model with little empirical support.

From a purely descriptive point of view it is interesting that, in general, the lottery winners seem to be more skilled than the family immigrants. In order to investigate this difference further it is possible to examine whether or not it is present across lotteries or whether one particular wave is driving the results.

For all countries the data include information on which immigrants were admitted under the first and second lotteries. For Ireland, the data also include information on those admitted under the first wave of the third program. Table 6 presents results from regressions in which the individuals from the lottery groups of Table 5 are broken down into the particular lotteries under which they were admitted. Once again, the reference category is the family group. Only six of the countries are reported because two of the remaining three were not included in more than one lottery and Egypt had only

Table 6: Regressions Estimating Lottery/Family Wage Differences with Lottery Groups Broken into Different Lotteries

Lottery	Canada	Poland	Indonesia	Japan	Ireland	Argentina
Lottery 1	0.120 (0.007)	0.104 (0.010)	0.113 (0.021)	0.113 (0.016)	0.068 (0.008)	0.183 (0.023)
Lottery 2	0.146 (0.060)	0.101 (0.031)	0.163 (0.066)	0.164 (0.058)	0.033 (0.03)	0.091 (0.055)
Lottery 3	N/A	N/A	N/A	N/A	0.0002 (0.008)	N/A

one immigrant in one of the lotteries.

In four of the six countries the skill levels of the lottery immigrants relative to the family immigrants are greater for both lottery groups. This supports the idea that the greater skill levels of the lottery groups are the result of some systematic selection process as opposed to a random occurrence. That the skill level of the Irish and Argentinian lottery winners converges to that of the family immigrants dilutes this finding. For the Irish, part of the explanation for this convergence may lie in the fact that in order to qualify for a greencard under the third lottery, the winners had to have an offer of one year's employment in the U.S. This provision may have favored illegals already in the U.S. If the occupations reported by these illegals are the jobs they are doing illegally in the U.S., this explains this part of the convergence. No ready explanation exists for the convergence seen under lottery 2. However, as only 76 individuals come under this heading out of an Irish lottery total of 12,151, results for this wave are of less interest than the other two waves. In the case of Argentina, the lack of significance for the second lottery may also be due to the low number of people admitted under that lottery, only 30.

The observation that the lottery immigrants are, in general, more skilled than the family immigrants suggests that the selection of lottery immigrants may be influenced by a process other than the one described in the model. One possible alternative explanation of the relative skill levels

views the presence of family less in a utility sense and more as a labor market resource. If families offer support to immigrants either through providing employment or through directing immigrants toward employment opportunities, a difference will be generated between those who immigrate with family present and those without family, i.e., the lottery immigrants. If this sort of support from families is particularly important for those at the lower end of the income distribution, the lottery group will have a smaller proportion of low-skilled people. One can think in terms of an unskilled worker who will migrate only if he will have help in finding a job, and a highly skilled worker who will migrate independent of any help.

Section 4: The Locational Decisions of Lottery Immigrants

In the model I assume that the utility from the presence of family members would be higher in the U.S. for family immigrants relative to lottery immigrants. In order to test this assumption, I use information on the location decisions of the various immigrant groups. The implications of the analysis go beyond testing an assumption of the model. Location decisions of immigrants have implications for the social make-up of regions and for public budgetary situations. Location decisions of immigrants also reveal information on the extent of assimilation into U.S. life.[4]

As with all economic goods, whenever a particular good is

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[4] See Ann Bartel and Marianne Koch in Abowd and Freeman (eds.)

not available individuals will seek a substitute. For lottery immigrants the good that is not available is the presence of family members in the U.S. and the substitute which is proposed is the presence of people of the same national origin. The result of this should be a greater concentration of lottery immigrants in areas where they find large numbers of their compatriots. Family immigrants, however, are less in need of the substitute good. They will be more likely to move away from the concentration of compatriots, especially if they are marrying Americans or coming to family members who have been in the United States for a while and have moved away from the hub. Even if the primary purpose of the family in migration is to provide the labor-market support described above, the utility dimension of family can still exist, so the reasoning here is still valid.

In order to test this, I focus on Irish immigrants. The main reason for this is that the Irish are concentrated in one area of the country and this concentration facilitates the econometric analysis presented later. The data have, for each individual, the zip code of intended residence. Table 7 shows how the Irish are distributed across the U.S. as a group and under different classes of admission. The numbers show that 67.9 percent of all Irish immigrants intend to reside in the New England and Middle Atlantic regions. Of the family immigrants 62.4 percent intend to reside in the two regions mentioned above. The corresponding figure for the lottery immigrants is 69.4 percent, so the predicted greater

Table 7: The Geographic Distribution of Irish Male Immigrants by Census Region and Class of Admission

	Family		Skill		Lottery		Total	
Region	#	%	#	%	#	%	#	%
New England	391	18.0	29	11.0	2594	21.3	3014	20.7
Middle Atlantic	960	44.4	76	28.8	5844	48.1	6880	47.2
South Atlantic	164	7.6	31	11.7	675	5.6	870	6.0
East South Central	18	0.8	4	1.5	72	0.6	94	0.6
East North Central	194	9.0	29	11.0	900	7.4	1123	7.7
West North Central	34	1.6	5	1.9	110	0.9	149	1.0
West South Central	50	2.3	13	4.9	139	1.1	202	1.4
Mountain	29	1.3	7	2.7	97	0.8	133	0.9
Pacific	324	15.0	70	26.5	1720	14.2	2114	14.5
Total	2164	100	264	100	12151	100	14579	10

concentration of the lottery immigrants is evident.

I performed two chi-squared tests to see if the different proportions of family and lottery immigrants in the different regions are statistically significant. One test used the nine regions and produced $\chi^2 = 68.925$. As $\chi^2_{.95}(8) = 15.5$, the null hypothesis that the proportions were the same was easily rejected. The second test considered just two areas. The Middle Atlantic and New England were treated as one region and the other seven regions as another region. In this test $\chi^2 = 9.593$, again allowing the easy rejection of the null hypothesis that the proportion of family and lottery immigrants in each region is the same, since $\chi^2_{.95}(1) = 3.84$.

In order to ensure that the different locational pattern between lottery and family immigrants is not solely an Irish phenomenon, I also considered the locational pattern of Polish immigrants. Polish immigrants are concentrated in two areas, the East North Central and the Middle Atlantic. Of the lottery immigrants 87.9 percent are in these two regions. The corresponding figure for the family-based immigrants is 80.6 percent. I performed a chi-squared test to see if the proportions of lottery and family immigrants were significantly different. In this test $\chi^2 = 95.627$. As $\chi2_{.95}(8) = 15.5$, the null hypothesis of equal proportions was once again rejected.

To examine further the hypothesis that the lottery immigrants will be more heavily concentrated in the area where compatriots are found I performed the following test. As the

Boston/New York area is the center of the Irish community in the U.S., the zip code for each immigrant is matched with a measure of distance from New York City. This distance measure is set equal to zero for Massachusetts, Connecticut, New Jersey, New York and Rhode Island, so that no distance is imputed to those who remain in what amounts to the Irish hub. For each individual there now exists a measure of the extent to which they moved to areas away from the Irish hub of the Boston/New York area and, as such, a measure of the need for the substitute good for the presence of family. The usefulness of the single area concentration of the Irish for the present task should now be apparent. If it is true that the family immigrants are less in need of the substitute of the presence of compatriots than the lottery immigrants, we should observe the family group moving out of the Irish hub to a greater extent than the lottery group.

Table 8 presents results from Tobit type regressions in which the dependent variable is distance in miles from New York City to the largest city in the State where the immigrant intends to reside. Tobit analysis is used because over half the values of the dependent variable are zero. Results from similar estimates are presented in Table 9, the difference between the two being the pooling of all lottery immigrants in Table 8 and the breaking up of this group into three waves in Table 9. The distances are taken from the Rand-McNally Road Atlas of 1993. Only the continental United States is included, which causes the loss of a tiny proportion of the sample. The

Table 8: Tobit Analysis of the Location Decisions of Irish Lottery Immigrants

Variable	MODEL 1	MODEL 2	MODEL 3
INTERCEPT	-1725.139 (358.763)	-1700.613 (363.021)	-2335.170 (444.338)
AGE	62.153 (20.885)	56.515 (21.066)	79.649 (23.173)
AGE SQUARED	-0.677 (0.283)	-0.596 (0.286)	-0.708 (0.291)
SKILL	967.673 (155.471)	976.313 (156.331)	2298.677 (710.769)
LOTTERY	-315.412 (64.959)	-263.243 (72.576)	359.047 (256.807)
MARRIED	-13.654 (52.998)	-35.462 (53.898)	-9.681 (54.834)
YEARS in U.S.	-	66.786 (28.752)	70.492 (28.777)
LOTTERY*AGE	-	-	-19.459 (7.720)
SKILL*AGE	-	-	-40.388 (20.910)

N = 14,442

set of independent variables is similar to those used in the regressions presented in Table 5. One variable that is added here is YEARS IN U.S. For immigrants who are already in the U.S. on non-immigrant visas, the data include information on the year of non-immigrant admission. For these individuals YEARS IN U.S. is equal to the year in which they got their greencard minus the year they arrived on a non-immigrant visa. For those newly arrived in the U.S. this variable equals zero. YEARS IN U.S. may also be equal to 0 for many illegals, since they may not want to reveal that they were residing in the U.S. This variable is included to capture possible assimilation effects which would lead immigrants to move further from the hub.

In Table 8, Model 1, the negative coefficient on the LOTTERY variable and its statistical significance are as predicted by the model, i.e., the lottery immigrants move out of the hub to a lesser extent than the family immigrants. In Model 2, YEARS IN U.S. is added and the negative and significant coefficient on lottery remains. The sign and significance of the coefficient of YEARS IN U.S. is as expected.

In Table 8, Model 3 two interaction terms are added, producing an interesting twist in the results. The coefficient of LOTTERY loses its significance, but the LOTTERY*AGE interaction term is negative and significant. This indicates that the observed greater concentration of the lottery immigrants in the Northeast relative to the family immigrants

works through older lottery immigrants settling more in this area. This result also indicates that the need for the substitute for family is stronger for the older lottery immigrants. If youth is more of a time for freedom and independence, this could explain the result. As they age, familiarity may be desired. If one thinks in terms of families providing support in the labor market, the greater concentration of the lottery immigrants could be a result of them looking to compatriots to provide the network that family immigrants get from family members already in the U.S. If such networks are more important for older workers, then the greater concentration of older lottery immigrants makes sense.

Table 8 also shows that the skill-based immigrants are less geographically concentrated than the family-based immigrants. The reason for this may be that sponsorship by an employer is required by this group when permanent residency is being granted. The location of a skill-based immigrant is therefore determined by the location of the employer. The negative coefficient of SKILL*AGE indicates that older skill-based immigrants will only move if the prospective employer is in the Irish hub.

Earlier in this chapter we saw that the observed higher skill levels of the Irish lottery immigrants relative to the family immigrants was the result of the higher skill levels of the first wave of lottery immigrants. The third wave did not share this feature, possibly because of the presence of illegals among this group. In order to see if the first and

third waves also differ in their location choices I reestimated the distance equations, breaking the lottery group into three waves. Since the first wave of Irish lottery winners was more typical of the lottery winners in general, it may be that the experience of this group is more generally applicable. The results are reported in Table 9.

The pattern of results in the models in Table 8 is repeated to a great extent in Table 9. In Model 1 the negative coefficient of LOTTERY is repeated in the coefficients of LOTTERY 1, 2 and 3. The lack of statistical significance for LOTTERY 2 may be a function of the relatively small number of immigrants in this category, a mere 76. The statistical significance for LOTTERY 1 and 3 remains in Model 2 where YEARS IN U.S. is added. Finally, the twist produced by the addition of the interaction terms is repeated.

While the negative coefficients on the lottery variables are consistent with the utility arguments in the model, an alternative interpretation could be given. Those living in the Boston/New York area, both illegals and non-resident aliens, might have had better information on the lottery programs because of the big Irish community and so a greater proportion of applicants may have come from here. Thus the concentration of the lottery winners could result from information as opposed to preferences.

One implication of this alternative interpretation is that the lottery winners who were already in the U.S. should show a greater concentration than lottery winners who are new

Table 9: The Regressions of Table 8 with the Lottery Group Broken into Three Waves

Variable	MODEL 1	MODEL 2	MODEL 3
INTERCEPT	-1710.386 (355.507)	-1682.745 (359.442)	-2387.375 (447.174)
AGE	59.383 (20.811)	54.252 (20.992)	79.686 (23.190)
AGE SQUARED	-0.651 (0.283)	-0.577 (0.285)	-0.710 (0.291)
SKILL	978.384 (155.009)	989.135 (155.889)	2335.872 (710.652)
LOTTERY 1	-299.122 (65.416)	-233.273 (73.220)	391.310 (266.837)
LOTTERY 2	-249.230 (315.317)	-182.208 (318.643)	-141.527 (1156.702)
LOTTERY 3	-304.791 (70.637)	-273.400 (78.417)	457.402 (297.921)
MARRIED	18.125 (43.628)	3.357 (44.318)	25.591 (45.049)
YEARS in U.S.	-	64.653 (28.300)	68.673 (28.753)
LOTTERY 1*AGE	-	-	-19.564 (8.139)
LOTTERY 2*AGE	-	-	-0.197 (36.539)
LOTTERY 3*AGE	-	-	-23.079 (9.192)
SKILL*AGE	-	-	-41.235 (20.915)

N = 14,442

arrivals. This implication can be tested by estimating a distance regression using only the lottery winners and including a dummy variable indicating those who were already in the U.S. and are adjusting to permanent residency. Such a regression shows no statistical difference between adjusters and new arrivals.

Since illegals may appear to be new arrivals if they deny having been in the U.S., this result on the adjuster/new arrival dummy variable cannot be considered conclusive. It still could be that the illegals in Boston and New York have been in the U.S. for a while and have better information on the lottery through the Irish community.

There are two empirical reasons to doubt that the illegals are driving the results on the location of lottery winners. If the first and the third waves differ in the proportions of illegals present, the location choices of the two should differ if illegals are driving the result. No such difference is evident. The coefficients of the age/lottery interactions are also informative. If illegal immigrants are younger than other immigrants, as seems to be the case, and the concentration of illegals in the Boston/New York area is driving the lottery result, the age/lottery interaction coefficient should be positive: younger lottery immigrants should show more concentration. The coefficients on the interactions show that the younger lottery immigrants are actually more dispersed. It is older lottery immigrants who produce the result that lottery immigrants move out of the

Northeast to a lesser extent. This makes it less likely that illegals are driving the result.

While there are empirical reasons to doubt that legal and illegal aliens already in the U.S. cause the lottery distance results on their own, it is difficult to ascertain their joint effect. Fundamentally, the problem is one of inaccurate data arising from possible inaccuracies in recording whether illegals who won greencards were already present in the U.S.

Section 5: Summary and Conclusion

In this chapter I have used the existence of an unusual category of immigrants to gain some insight into the nature of the migration decision and selection outcome. I developed a model that shows how the decision to migrate differs at the margin for family and lottery immigrants. I also showed that if the lottery immigrants from a country are more skilled than the family immigrants, it must be because those who can make the greatest monetary gain through migration are located in the upper end of the skill distribution. Likewise, if the lottery immigrants are less skilled than the family immigrants, those with the greatest gain from migration are from the lower end of the distribution. The potential gain for different groups is influenced by the relative levels of income inequality between two countries.

The empirical results showed that the lottery groups from a range of countries differ in their skill levels from the family groups. Furthermore, this difference persists over different lottery programs, so it is likely to be the product

of a systematic selection process. The idea that the relative skill levels of family and lottery immigrants is a result of the interaction between private utility maximization and the level of inequality in home countries receives only mixed support. The role played by family in providing labor-market information to immigrants might be a more powerful determinant of relative skill levels between the two groups.

For Irish immigrants the location decision of lottery immigrants differs from that of the family immigrants. This indicates that the lottery immigrants substitute the company of compatriots for the presence of family.

The stated goal of the lottery programs was not related to labor market outcomes. From the evidence here, however, admitting immigrants in this manner affects the labor-market quality of the immigrant pool. For the countries considered the general result is that admission through lottery produces more skilled immigrants. Without family in the U.S., immigration is more difficult for lottery immigrants, so that only those who will do particularly well migrate. This supports the view of immigrants contained in the work of Chiswick, i.e., that they are a group of well motivated and capable individuals who take the risks inherent in migration in order to better themselves. Such a selection result justifies admission by lottery beyond the stated goal of diversification in the national make-up of the immigrant pool.

The results on location found in this chapter put the lotteries in a less favorable light. The concentration of

immigrants puts pressure on certain areas in terms of the costs associated with the presence of a large group of immigrants. Such concentration also reduces the chances of assimilation. If the lotteries produce greater concentration, then this may offset the benefits the lotteries produce in the form of higher quality immigrants.

Chapter 4

Using the 1988-1990 Immigrant Cohort to Learn More about Immigrant Selection

Section 1: Introduction

In Chapter 2 of this dissertation I examined the labor-market characteristics of immigrants from the years 1978 to 1980 in an effort to identify the quality of immigrants coming from various countries. Furthermore, I attempted to identify country characteristics which could help predict the relative skill level of immigrants coming from a particular country.

In this chapter I repeat the analysis undertaken for the 1978-80 cohort using the 1988-90 cohort. Once again, I take the skill difference between the skill-based and family-based immigrants to be an indicator of the nature of the outcome of each country's immigrant selection process. I then use country-specific characteristics use in an effort to explain differences in the skill indicator across countries.

In the model developed in Chapter 2 the variable of greatest interest in explaining the variation in the skills of immigrants across countries was income inequality. The theoretical prediction concerning the effect of income inequality on the skill indicator was supported by the empirical results. The primary purpose therefore in repeating the analysis with the later cohort is to see if the theoretical prediction continues to be supported. The availability of values of the skill indicator and income inequality for a number of countries for both periods also

allows an extension of the testing.

The availability of data on immigrants from the late 1970's and late 1980's, combined with rising income inequality in the U.S. over this period, makes it possible to consider the effect of growing income inequality in the destination country on the make-up of the immigrant group. This rise in inequality and some proposed explanations have been summarized by Levy and Murnane (1992). They write that the year 1979 "marked the beginning of a sharp acceleration in the growth in earnings inequality." They also point out that the effect of the increasing inequality in the period 1979 to 1987 was to increase the proportion of men earning more than $40,000 (in 1988 dollars) while at the same time increasing the proportion of men earning less than $20,000 (in 1988 dollars). I address the possible effect of increased inequality in the destination country on immigrant quality in this chapter.

Section 2: Skill-Based and Family-Based Immigrants Revisited

In this section, I review the model of Chapter 2. I then present the results of the empirical analysis using the 1988-90 immigrant cohort. The fundamental point of the model is that relative income inequality between a country of origin and a destination country will influence the nature of the immigrant flow. If income in the home country is more equally distributed relative to the destination country, those at the upper end of the home country's income distribution have an incentive to migrate. Conversely, if income is more unequally distributed in the home country, those at the lower end have

an incentive to migrate.

Immigrants can gain permanent residency in the U.S. if they are highly skilled or if they have family ties in the U.S. Immigrants who are admitted because of their high skill levels will be located at the upper end of the U.S. income distribution, regardless of their country of origin. The position of the family-based immigrants in the income distribution depends, however, on the immigrant selection process of each country. A country with a high level of income inequality will, by the logic of the last paragraph, tend to send lower-skilled immigrants. This produces a relatively large difference in the skill levels of the skill-based and family-based immigrants from such a country. A country with a relatively high level of income equality will tend to send high- skilled workers, so that for such a country the difference in skills between the skill-based and family-based immigrants will be relatively small.

In order to test this model it is necessary to estimate the difference between the skill levels of the family-based and skill-based immigrants for a range of countries. I estimate the wage premium of the skill-based relative to the family-based. I then regress the wage premium against country characteristics to see if the variation across countries is explained.

As in Chapter 2, the data I use in estimating the skill difference between the family-based and skill-based are from the Immigration and Naturalization Service. For each

individual the data set contains information on occupation, age, class of admission, sex, marital status and nationality.

In the data from the period 1978 to 1980 the reporting of occupation was quite disaggregated and produced over 400 occupational categories. Unfortunately, the reporting in this data set is much more aggregated and only 25 occupational categories are produced. This lead to a concern that little variation would be captured in the empirical analysis, but positive results did emerge.

I transformed the occupational variable into a wage measure by matching the occupation of each individual with the median weekly earnings of full-time wage and salary workers in those occupations. I took these data from Employment and Earnings of January 1990. I included only males aged 22 to 64 so the earnings data are male earnings. I selected the countries because of the availability of data. Of the 39 countries, 25 were also considered in Chapter 2.

The equation I estimate for each country is the same as that in Chapter 2, but it is shown here for convenience, with explanations of the variables:

$$\begin{aligned} LWAGE = {} & b_0 + b_1\, AGE + b_2\, AGESQ + b_3\, MARRIED + b_4\, D88 + \\ & b_5\, D89 + b_6\, D90 + b_7\, ADJUSTER + b_8\, YEARS\ IN\ U.S. \\ & + b_9\, SKILL + b_{10}\, REFUGEE + e \end{aligned}$$

where LWAGE is the logarithm of the earnings associated with the occupation reported by the immigrant; AGESQ is age squared; MARRIED is a dummy variable equal to 1 if the individual is married and 0 otherwise; D88, D89 and D90 are

dummy variables for each year of admission (1987 is the omitted year); ADJUSTER is a dummy variable equal to 1 if the individual was already in the U.S. as a non-resident alien and is adjusting to permanent residence and 0 otherwise; YEARS IN U.S. is years in the U.S. for adjusters to permanent residence (it equals 0 for new arrivals); SKILL is a dummy variable equal to 1 if the individual is a skill-based immigrant and 0 otherwise; REFUGEE is equal to 1 if the individual gains admission as a refugee and 0 otherwise.

The coefficient of SKILL can be interpreted as the wage premium of the skill-based relative to the family-based. For the reasons given above this is taken to be an indicator of the nature of the flow from a country's immigrant-selection process.

Table 10 presents the results from the regressions performed for each country. As was the case with the regressions using the 1978-80 cohort, there is clear variation in the coefficient of SKILL. For Danish immigrants, the skill-based are in occupations which pay 16 percent more than the occupations of the family-based. For Sweden this figure is 19.6 percent and for Switzerland it is 18.2 percent. At the other end of the spectrum, the skill-based immigrants from Mexico are in occupations which pay 52 percent more than those of the family-based immigrants. This figure is also 52 percent for Costa Rica and 50.3 percent for Jamaica.

Table 11, Models 1-3, presents results from regressions in which the dependent variable is the value of the SKILL

Table 10: Estimating the Wage Premium for the Skill-Based Immigrants from the 1988-90 Cohort

Dependent Variable: Log wage				
Country	SKILL Coefficient	Standard Error	# Skill-Based	N
Belgium	.2559	.0345	136	403
Denmark	.1600	.0433	76	408
Finland	.2762	.0588	44	152
France	.2977	.0206	372	2217
Germany	.2563	.0168	488	2459
Hungary	.3421	.0443	38	871
Italy	.4496	.0272	155	1986
Netherlands	.2344	.0256	259	1030
Norway	.2178	.0604	35	402
Poland	.4662	.0211	194	7014
Portugal	.5030	.0469	33	3237
Spain	.3207	.0356	80	1045
Sweden	.1956	.0277	190	812
Switzerland	.1820	.0338	133	654
U.K.	.2838	.0063	3365	18506
China	.3911	.0114	1596	24735
India	.3117	.0101	3434	19914
Indonesia	.3646	.0298	167	601
Israel	.2931	.0150	563	3490
Japan	.3255	.0162	650	2614
Malaysia	.3246	.0247	341	957
Pakistan	.3935	.0221	351	4827
Philippines	.3988	.0178	439	24923
Thailand	.4457	.0322	98	1909
Brazil	.3585	.0257	181	1691
Canada	.3122	.0080	1864	10402
Chile	.4131	.0338	85	1294
Colombia	.2976	.0216	117	6431

Table 10 (cont'd):

Dependent Variable: Log wage				
Country	SKILL Coefficient	Standard Error	# Skill-Based	N
Costa Rica	.5203	.0705	15	896
Dominican Republic	.4794	.0585	25	14822
Guatamala	.4810	.0507	22	4189
Honduras	.4291	.0737	10	2767
Jamaica	.5031	.0327	69	12924
Mexico	.5196	.0113	341	70118
Panama	.3778	.0784	18	1075
Peru	.4680	.0252	132	4972
Australia	.2964	.0230	263	1643
New Zealand	.2984	.0402	93	718
Morocco	.4813	.0840	15	708

coefficient for each country from Table 10. As the dependent variable is a regression estimate, the standard error will differ across observations. In order to correct for this weighted least square regressions are estimated, the weights being the inverse of the standards errors of the SKILL coefficients. The dependent variable in Table 12 is the difference in the SKILL coefficients for each country for the periods 1978 to 1980 and 1988 to 1990.

The results in Models 1 and 2 of Table 11 support the Borjas model, since the sign and significance of the coefficient of INEQUALITY are as predicted. The coefficients of PER CAPITA GNP in Models 2 and 3 are negative and significant which is in contrast to the results for the period 1978 to 1980. For that period the coefficients on this variable were either positive or insignificant. One possible explanation for the differing results is connected with the measurement of GNP. For the later period a purchasing power parity measure is used, whereas in the earlier period the GNP measure was exchange-rate based. To the extent that the purchasing power parity measure may give a truer reflection of the relative conditions faced by immigrants, the estimates for the later period may be more believable. The result that higher per-capita income is associated with a smaller difference between the family- and skill-based immigrants and hence positive selection is consistent with the results of Borjas (1987b).

In Model 3 a variable controlling for distance is added.

Table 11: Using Country-Specific Characteristics to Explain the Variation in the Coefficient of SKILL for 1988-90

Dependent variable: Coefficient of SKILL from Table 10			
Variable	Model 1	Model 2	Model 3
INTERCEPT	0.307 (0.022)	0.711 (0.121)	0.889 (0.143)
INEQUALITY	0.007 (0.003)	0.005 (0.0027)	0.003 (0.003)
PER CAPITA GNP	-	-0.044 (0.013)	-0.057 (0.014)
DISTANCE	-	-	-0.012 (0.006)
Adjusted R^2	0.088	0.292	0.356

Table 12: Regression Using Changes in Inequality and Changes in Per-Capita G.N.P. to Explain Changes in the SKILL Coefficient

Variable	Model 1	Model 2
INTERCEPT	-0.048 (0.016)	-0.048 (0.015)
CHANGE in INEQUALITY	0.001 (0.003)	0.001 (0.003)
CHANGE in GNP	-	0.013 (0.010)
Adjusted R^2	-0.035	0.002
N	25	25

This DISTANCE variable is measured as the distance in air-miles from the capital of each country to the nearest of New York, Los Angeles or Miami. With the addition of this variable the significance of the INEQUALITY coefficient is lost, although the sign is still as predicted. The sign of the DISTANCE coefficient is the same as it was in the earlier analysis. This result, that greater distance is associated with higher-quality immigrants, is also consistent with other work (Schwartz 1973). One possible explanation for the negative sign is that the further away a country is, the greater the expense in coming to the U.S. If the low-skilled face an income constraint, their immigration is curtailed. This leaves a pool of high-skilled immigrants and hence a smaller difference between the family-based and skill-based immigrants. The DISTANCE coefficient can also be explained in terms of the psychic costs of migration. The further away a country is, the greater are the costs due to the greater difficulty of return visits or greater cultural differences. Assuming psychic costs to be higher for the low-skilled, the disincentive attached to distance will be greater for them. Again, the resulting pool of immigrants will be relatively high-skilled.

Table 12, Model 1, presents the result of a regression in which the change in the inequality levels over the period is regressed on the change in the SKILL coefficient over the same period. In Model 2 the change in GNP, taken from the World Development Report of 1982 and 1990, is added. The values of

SKILL for the period 1978 to 1980 were re-estimated using weekly earnings data instead of the yearly earnings data that had previously been used. This makes the measures of SKILL consistent across the periods.

From the comparative statics in Borjas (1987b) we know that, in general, countries which experienced rising inequality over the period should also show a greater difference between the family- and skill-based immigrants. While the signs of the coefficients of CHANGE IN INEQUALITY are as predicted by this general result the estimates are insignificant.

There are a number of possible explanations for these results. The explanation most damaging to the model is that fixed effects are causing the cross-section estimates of SKILL and not inequality. However, with only 25 observations in the differenced regressions, it could also be that the lack of significance is a result of the small sample. It is also possible that the small number of occupations in the 78-80 data set made insignificant results likely. Another possible explanation can be found in the comparative statics of the model. Borjas has shown how, under certain circumstances, a rise in inequality in the home country can lead to a rise in immigrant quality.[1] A fuller explanation of this comparative static result can be found in Appendix 3.

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[1] Borjas, A.E.R. 1987, page 538

Section 3: The 1979-80 and 1989-90 Immigrant Cohorts Compared

The focus of the work so far has been on the effect of income inequality in sending countries on the characteristics of the immigrants coming from those countries. In this section I reverse the focus. As income inequality rose in the United States over the 1980's, it is possible to see if a change in the skill levels of immigrants coming to the U.S. accompanied it. One reason to expect a change is that rising inequality increases the incentive to migrate to the U.S. for those at the upper end of the distribution. Likewise it reduces the incentive for those at the lower end. This change in relative incentives can be seen if the changing earnings experience of different education groups is considered. Levy and Murnane (1992) note that for males aged 25 to 34 the earnings of high-school graduates fell by 12 percent over the period 1979 to 1987, while the earnings of college graduates grew by 8 percent. As Borjas (1991) points out, an increase in the variance of income in the United States will produce a composition effect whereby immigrant quality will rise.

As immigrants respond to changes in relative conditions in the home and host countries, the effect of the rise in inequality in the U.S. could be negated by rising inequality elsewhere. Katz and Loveman (1990) show that inequality rose in the United Kingdom in the 1980's so this it is possible that this negating influence is present. If I find no quality difference between the immigrants from the two cohorts, it could be because of a rise in inequality elsewhere or because

of other region-specific influences on immigrant quality. Whatever the underlying causes may be, it is of interest to see what the trend is in immigrant quality.

A comparison of the immigrants from the late 1970's and the late 1980's has been done by Funkhouser and Trejo using CPS data. According to their findings "these data suggest that male immigrants who entered the United States during the late 1980's are more skilled than those who arrived earlier in the decade". They caution, however, that because of small sample sizes their work cannot be seen as conclusive. Borjas (1994) has also compared these immigrant cohorts, using data which includes the 1990 Census. He finds the opposite to Funkhouser and Trejo. According to his results immigrant quality declined over the 1980's, although at a slower pace than during the 1970's.

In the comparison in this chapter I use yet another data set. The data I use are part of those used earlier, i.e., the I.N.S. data on legal immigrants admitted during the years 1978 to 1980 and 1988 to 1990. I omit the years 1978 and 1988 in order to make the data set more manageable. This still leaves around 400,000 males aged 22 to 64 for analysis.

One group that is not included in the data are those who were granted permanent residency under the legalization provisions of the Immigration Control and Reform Act of 1986. This was an amnesty program for illegals who had resided in the U.S. for a number of years. As this group is very large, 880,372 aliens in 1990, and is made up of former illegals,

inclusion would have produced a biased picture of the relative skill levels of the two cohorts. As such, I consider their exclusion an advantage for the present purpose.

As before, the occupation of each individual has to be matched with a wage. To do this I use data from the Bureau of Labor Statistics. For the 1989-90 group median I use weekly earnings in 1990 of full time wage and salary workers. For the earlier group I use the corresponding earnings from 1983, the earliest year for which comparable data were available. After adjusting for inflation, the earnings data show that median earnings in the U.S. population were about 1 percent lower in 1990 than in 1983. Any changes in the earnings of immigrants can be assessed in this context.

Table 13 shows the mean wages of the two cohorts. Also shown are the results from four regressions in which all males aged 22 to 64 who were admitted in the years 1979 to 1980 and 1989 to 1990 are included and the dependent variable is the logarithm of wages. In each regression a dummy variable is included which is equal to one if the individual was admitted in the years 1989 to 1990 and zero otherwise. The coefficient of this dummy variable measures the extent to which the two cohorts differ in their labor market quality.

The mean wages are essentially the same for the two cohorts. Since wages in the U.S. population fell by 1 percent over the period, this amounts to a very modest rise in immigrant quality. More important, these means imply that the decline in immigrant quality of the 1970's did not continue in

Table 13: Regressions Using All Male Immigrants Aged 22-64 Admitted in the Years 1979-80 and 1989-90

Variable	Model 1	Model 2	Model 3	Model 4
INTERCEPT	5.287 (0.007)	5.398 (0.007)	5.496 (0.007)	5.590 (0.008)
AGE	0.030 (0.0004)	0.023 (0.0004)	0.021 (0.0004)	0.021 (0.0004)
AGE-SQUARED	-0.0004 (0.000005)	-0.0003 (0.000005)	-0.0002 (0.000005)	-0.0003 (0.000005)
MARRIED	-0.00009 (0.001)	0.003 (0.001)	0.011 (0.001)	0.010 (0.001)
89-90 COHORT	0.009 (0.001)	0.010 (0.001)	0.009 (0.001)	0.009 (0.001)
SKILL	-	0.427 (0.002)	0.376 (0.002)	0.337 (0.004)
REFUGEE	-	-0.091 (0.002)	-0.103 (0.002)	-0.078 (0.004)
REGIONAL DUMMIES	No	No	Yes	Yes
SKILL * 89-90	-	-	-	0.060 (0.005)
REFUGEE * 89-90	-	-	-	-0.060 (0.005)
Adjusted R^2	0.016	0.102	0.143	0.145
Mean earnings 79-80 = $385; 89-90 = $384 N = 399,650				

the 1980's. This is in contrast to the findings in Borjas (1994).

In the first regression reported in Table 13, Model 1, age and marital status are controlled for. The modest rise in immigrant quality is now seen in the 89-90 cohort dummy variable and is larger than in the case of the simple means.

One possible source of a change in the skill level of immigrants is an increase in the number admitted on the basis of their skills. In the data set there is an increase in the number of these admittees, from 4 percent in 1979 to 1980 to 6.2 percent in 1989 to 1990. Similarly, evidence presented earlier in this dissertation shows that refugees are relatively less skilled than other immigrants, so a change in their proportion could alter earnings. Again, their proportion did change over the period, from 13.8 percent in 1979-80 to 12 percent in 1989-90. This increase in the proportion of the relatively high-skilled and decrease in the proportion of the relatively low-skilled may explain the overall skill increase seen in Model 1. As such, in Model 2 I add dummy variables to control for class of admission, but the positive and significant coefficient on the 1989-90 cohort remains.

Another possible explanation for the change in skill levels is a change in the national origin mix of immigrants. Of particular note is a fall in the proportion of immigrants coming from Latin America. In the 1979-80 cohort 38.5 percent are from Latin America whereas in the 1989-90 cohort 35.4 percent are from this region. Much work on the economics of

immigration finds immigrants from Latin America to be less skilled than those from elsewhere, so a decline in their proportion might explain the increase in skill levels.

In Model 3 I add dummy variables to control for regions, with Africa being the omitted region. The coefficient on the 1989-90 cohort dummy stays the same. This indicates that the change in immigrant quality occurred for reasons other than changes in the class of admission mix or the national origin mix.

In model 4 I add interaction terms between the skill and refugee classes of admission and the 1989-90 cohort. Their inclusion controls for the possibility that the positive cohort effect is a result of the later skill-based immigrants being more skilled than the earlier skill-based immigrants or the later refugees being more skilled than the earlier refugees. The coefficient on the 1989-90 cohort dummy variable remains positive and significant after the addition of the interaction dummy variables. This seems to support the idea that there was an increase in the general skill levels of immigrants over the period.

Care must be taken not to read too much into the various coefficients because of the use of occupational wages and the increase in inequality over the period. The SKILL*89-90 coefficient merely implies that the occupations held by skill-based immigrants paid more in the late 1980's. This could be because the skill-based immigrants became more skilled or because the returns to having particular skills rose. The

reason for including dummy variables for skill and refugee immigrants and the interactions was to isolate the trend in non-skill, non-refugee immigrants, i.e., the family immigrants. Assuming that family immigrant occupational attainment is either similar to or lower than the U.S. average, the persistence of a positive 89-90 cohort coefficient, while controlling for the other categories, indicates an improvement in the skill level of family immigrants over the period.

One additional potential concern in the interpretation of the coefficients is that any change in skill levels may have been a result of changes in I.N.S. skill requirements as opposed to changes in private behavior brought about by changing economic conditions. In her review of 1980's immigration legislation Elizabeth Rolph refers to the U.S. Congress altering the numbers of immigrants admitted under certain categories but she makes no mention of changing skill requirements. The most recent piece of legislation to address the issue of skills was the Immigration Act of 1990. Since the data set does not include immigrants admitted after its passage, it seems safe to assume that I.N.S. requirements are not driving the results.

The result of this comparison is different from the Borjas result. One possible explanation for the difference is that the Borjas data includes the immigrants admitted through the IRCA amnesty program, while my data set does not. The inclusion of this group of former illegals may explain why

Borjas observes a decline in skill levels, whereas I find a rise.

To explore the changes in the skill levels of immigrants over the period further, I broke the data set into seven regions and I performed separate analyses for each. I ran Models 1, 2 and 4 from Table 13 for each region and the results are reported in Table 14.

The most striking aspect of Table 14 is that three of the seven regions show evidence of rising immigrant quality, three show evidence of falling immigrant quality and one, Eastern Europe, shows mixed evidence. Without a uniform effect there is no general support for the argument that the rise in inequality brought about an increase in the skill levels of immigrants. However, if specific regions are considered, namely Western Europe and Canada, some support is found.

The Western Europe cohort effect is the largest and is in the direction expected. As Western Europeans may have greater information regarding the U.S., the positive cohort effect may be a response to the inequality stimulus noted. What is more, as Western European income levels are close to those of the U.S., it seems reasonable that the second moment of the income distribution may have more of an influence on migration decisions. Similar arguments can be made with regard to Canada whose cohort effect, though not as large as the Western European effect, is nonetheless positive.

The Eastern Europe case is interesting, as the coefficient on the 89-90 dummy variable changes sign as the

Table 14: Regressions for Seven World Regions on Male Immigrants Aged 22-64 Admitted in the Years 1979-80 and 1989-90

Variable	Canada			Oceania		
INTERCEPT	5.356 (0.037)	5.457 (0.035)	5.464 (0.035)	5.317 (0.066)	5.459 (0.063)	5.466 (0.063)
AGE	0.036 (0.002)	0.028 (0.002)	0.028 (0.002)	0.033 (0.004)	0.023 (0.003)	0.023 (0.003)
AGESQ'D	-0.0004 (0.00002)	-0.0003 (0.00002)	-0.0003 (0.00002)	-0.0004 (0.00004)	-0.0003 (0.00004)	-0.0003 (0.00004)
MARRIED	-0.030 (0.006)	-0.017 (0.006)	-0.017 (0.006)	0.031 (0.011)	0.059 (0.011)	0.060 (0.011)
89-90	0.018 (0.005)	0.026 (0.005)	0.018 (0.005)	-0.068 (0.010)	-0.055 (0.010)	-0.067 (0.010)
SKILL	-	0.245 (0.007)	0.215 (0.010)	-	0.392 (0.018)	0.302 (0.028)
REFUGEE	-	-0.156 (0.143)	-0.455 (0.285)	-	-0.077 (0.217)	0.259 (0.307)
SKILL * 89-90	-	-	0.059 (0.014)	-	-	0.151 (0.036)
REFUGEE * 89-90	-	-	0.401 (0.329)	-	-	-0.676 (0.434)
Adjusted R^2	0.033	0.108	0.109	0.033	0.122	0.125
N	14,760	14,760	14,760	4,848	4,848	4,848
Mean earnings	79-80 = $443	89-90 = $461		79-80 = $416	89-90 = $387	

Table 14 (cont'd):

Variable	Asia			Latin America		
INTERCEPT	5.383 (0.014)	5.554 (0.013)	5.555 (0.013)	5.470 (0.010)	5.495 (0.010)	5.494 (0.010)
AGE	0.028 (0.0007)	0.019 (0.0007)	0.018 (0.0007)	0.016 (0.0006)	0.014 (0.0005)	0.014 (0.0005)
AGESQ'D	-0.0004 (0.000009)	-0.0002 (0.000008)	-0.0002 (0.000008)	-0.0001 (0.000007)	-0.0002 (0.000007)	-0.0002 (0.000007)
MARRIED	0.044 (0.002)	0.036 (0.002)	0.036 (0.002)	-0.004 (0.002)	-0.004 (0.002)	-0.005 (0.002)
89-90	0.012 (0.002)	0.006 (0.002)	0.010 (0.002)	-0.011 (0.002)	-0.014 (0.002)	-0.012 (0.001)
SKILL	-	0.385 (0.003)	0.359 (0.006)	-	0.486 (0.008)	0.425 (0.017)
REFUGEE	-	-0.189 (0.003)	-0.138 (0.006)	-	-0.031 (0.003)	0.004 (0.006)
SKILL * 89-90	-	-	0.037 (0.007)	-	-	0.081 (0.019)
SKILL * 89-90	-	-	-0.079 (0.007)	-	-	-0.049 (0.007)
ADJUSTED R^2	0.017	0.122	0.123	0.008	0.032	0.033
N	142,309	142,309	142,309	143,103	143,103	143,103
Mean earnings	79-80 = $405	89-90 = $411		79-80 = $352	89-90 = $332	

Table 14 (cont'd):

Variable	Eastern Europe			Western Europe		
INTERCEPT	5.280 (0.039)	5.330 (0.038)	5.324 (0.038)	5.100 (0.022)	5.307 (0.021)	5.306 (0.021)
AGE	0.031 (0.002)	0.028 (0.002)	0.028 (0.002)	0.043 (0.001)	0.031 (0.001)	0.031 (0.001)
AGESQ'D	-0.0004 (0.00003)	-0.0004 (0.00003)	-0.0004 (0.00003)	-0.0005 (0.00002)	-0.0004 (0.00001)	-0.0004 (0.00001)
MARRIED	0.022 (0.007)	0.013 (0.006)	0.008 (0.006)	-0.015 (0.004)	0.004 (0.004)	0.004 (0.004)
89-90	-0.023 (0.006)	0.014 (0.006)	0.042 (0.007)	0.097 (0.003)	0.086 (0.003)	0.087 (0.003)
SKILL	-	0.393 (0.017)	0.368 (0.031)	-	0.338 (0.005)	0.348 (0.008)
REFUGEE	-	-0.088 (0.006)	0.141 (0.019)	-	-0.119 (0.043)	-0.061 (0.060)
SKILL * 89-90	-	-	0.028 (0.037)	-	-	-0.016 (0.011)
REFUGEE * 89-90	-	-	-0.255 (0.020)	-	-	-0.119 (0.088)
Adjusted R^2	0.017	0.075	0.086	0.046	0.122	0.122
N	14,402	14,402	14,402	50,452	50,452	50,452
Mean earnings	79-80 = $382	89-90 = $366		79-80 = $399	89-90 = $433	

Table 14 (cont'd):

Variable	Africa		
INTERCEPT	5.176 (0.036)	5.357 (0.035)	5.360 (0.035)
AGE	0.040 (0.002)	0.030 (0.002)	0.030 (0.002)
AGESQ'D	-0.0004 (0.00002)	-0.0003 (0.00002)	-0.0004 (0.00002)
MARRIED	-0.032 (0.006)	-0.032 (0.005)	-0.031 (0.006)
89-90	-0.057 (0.005)	-0.041 (0.005)	-0.049 (0.005)
SKILL	-	0.379 (0.010)	0.309 (0.016)
REFUGEE	-	-0.181 (0.011)	-0.218 (0.074)
SKILL * 89-90	-	-	0.115 (0.020)
REFUGEE * 89-90	-	-	0.041 (0.075)
Adjusted R^2	0.030	0.110	0.122
N	19,923	19,923	19,923
Mean earnings	79-80 = $404	89-90 = $385	

class of admission and interaction dummy variables are added. One possible explanation for the sign change between the first and second models is that the 1989-90 cohort contained more refugees as movement out of this area became easier as Communism weakened. Without controlling for this the 1989-90 cohort looks less skilled. Once class of admission is controlled for the positive cohort effect emerges. However, the positive effect is even stronger when the interaction terms are added. The REFUGEE*89-90 coefficient shows that the negative cohort effect in the simplest model is a result of the refugees in the 1989-90 group being particularly low-skilled. This indicates that it was not so much that more refugees were escaping, but that a different group of refugees was escaping. The positive coefficient on REFUGEE in the third model, when combined with the negative coefficient on REFUGEE*89-90, indicates that this particular flow took on a different character over this period.

Without data on relative inequality between the U.S. and the regions considered, the task of establishing a link between rising U.S. inequality and immigrant quality is a difficult one. An important result has, however, emerged from the analysis. The continued decline in immigrant quality found in Borjas (1994) is not supported by these data.

Section 4: Summary

In this chapter I have repeated the analysis of Chapter 2 using data for a later cohort. The outcome is continued support from cross-section regressions for the Borjas model in

that higher levels of income inequality tend to be associated with larger differences between the skill levels of skill-based and family-based immigrants. The continued support emerged even though the range of occupation categories reported fell from over 400 in the earlier data set to just 25 in the later set. The fixed effects model did not give support to the Borjas model but this may be because of the small sample of countries.

The analysis comparing the 1979-80 and 1989-90 cohorts is less conclusive. Although a modest increase in the skill level of immigrants over the period was detected in the sample of immigrants as a whole, the experience across regions was not uniform. The regions that were most likely to respond to changes in inequality did show positive cohort effects. This gives some support to the idea that immigrants do respond in a predictable way to changes in income inequality in the source and receiving countries.

Chapter 5

Summary and Conclusions

In this concluding chapter I first review what has been done in this dissertation. I next determine what has been learned, and then draw some conclusions regarding policy. Finally, I suggest some ideas for research that arise from this dissertation.

Section 1: A Review of What Has Been Done in the Dissertation

This dissertation has been a theoretical and empirical analysis of the differences in the labor-market quality of different immigrant groups, designed to determine the nature of the immigrant flows from different countries and how these flows are affected by various factors. The first two groups I compared were skill-based and family-based immigrants (Chapter 2 and Chapter 4, section 1). The idea behind examining these two groups was that a smaller difference in labor-market quality between the two for a given country would mean that the family-based immigrants from that country were relatively skilled. To the extent that the family-based immigrants reflect the general characteristics of those in a country who find it optimal to migrate, this skill-based/family-based difference measures the general nature of the immigrant flow from a country. An alternative view of the skill-based versus family-based immigrant difference is that it shows the extent to which a policy shift towards more skill requirements in immigration law would alter the nature of the immigrant flow from various countries.

The exercise in these chapters goes beyond simply seeing which countries send which types of immigrants. It is also designed to discover which types of countries send which types of immigrants. As the model that I used to predict the relevant country characteristics is based on the work of Borjas, the tests in Chapters 2 and 4 can also be viewed as a test of the Borjas model.

The next two groups of immigrants I compared were family-based immigrants and those who gained permanent residency through winning a greencard in one of the lotteries (Chapter 3). The model showed how the migration decisions of the two groups differed. According to the model, family-based immigrants were migrating to join family members, so no pecuniary compensation for the loss of family was required. Lottery-winning immigrants, however, were leaving family and thus required compensation in order for them to experience a utility gain from immigration. This greater need for financial compensation by the lottery immigrants meant that they would be selected from the group in the population with most to gain financially from immigration. If the lottery immigrants were more skilled than the family immigrants, those at the upper end of the income distribution must have the most to gain. Likewise, if the lottery immigrants were less skilled, those at the lower end must have the most to gain. Little support was found for this model but an alternative explanation for the results in this chapter was given. This alternative explanation was based on the notion of family as a provider of

an employment network.

I extended the comparison between the lottery and family-based immigrants to consider the location decisions of the two groups. The model suggests that the lottery immigrants will be more concentrated close to large numbers of compatriots. Compatriots may act as a substitute for the loss of family, which is a feature of the lottery immigrant experience relative to the family-based immigrant experience.

The final two groups I compared were those admitted in the years 1979 to 1980 and 1989 to 1990 (Chapter 4, section 2). The reason for examining these was to see how a change in income inequality in a host country, i.e., the U.S., would affect the nature of the immigrant flow into that country. As inequality in the host country rises, the incentive to immigrate for those who would be at the upper end of the U.S. income distribution rises. At the same time, the incentive to immigrate is reduced for those at the lower end. Overall, the rise in inequality should lead to an increase in the quality of the immigrant flow. Investigating the changes in the skill levels of immigrants over the 1980's is also of interest in itself. The observed decline in immigrant labor market quality from the 1960's until the early 1980's has been a major theme of the literature in this area. It is therefore of interest to see if this trend has continued.

Section 2: A Review of the Results

Five results can be isolated.

1) The wage premium of skill-based immigrants relative to

family-based immigrants varies across countries. This was found to be true using data from the years 1978 to 1980 and 1988 to 1990. For some countries the skill difference between the family-based and skill-based immigrants is relatively small, indicating that the family-based immigrants are reasonably skilled. For such countries, the imposition of skill requirements for a broader group of immigrants would not significantly alter the nature of the immigrant flow. For other countries there is a big difference between skill-based and family-based immigrants, so additional skill requirements would substantially alter the average character of the immigrant flow.

2) The level of income inequality in a country of origin affects the labor-market quality of those who choose to migrate. Again using data from the periods 1978 to 1980 and 1988 to 1990, the level of home country inequality helped explain the variation across countries in the labor-market quality of skill-based relative to family-based immigrants. This finding confirms the Borjas model (A.E.R. 1987) but may also be due to the fact that inequality of income in a country reflects an inequality of skills, rather than of the returns to skills. The results on the effect of country of origin GNP were contradictory between the two periods examined. The more believable result, however, is that higher levels of GNP are associated with smaller differences between skill- and family-based immigrants. The level of English language ability in a population also influences the quality of immigrants coming

from a country. Distance from the United States influences quality also.

3) In general, lottery immigrants are more skilled than family-based immigrants. The model suggested that home-country inequality would help predict the relative quality of lottery and family-based immigrants but this was not so. A possible explanation of the greater skill levels of the lottery group relative to the family group is that the family acts as a provider of employment or information about employment for family-based immigrants. This allows for the immigration of low-skilled family members. The lottery immigrants do not have this facility available to them, so the low-skilled may be eliminated from the pool of potential lottery immigrants.

4) Relative to family-based immigrants, lottery immigrants are more geographically concentrated close to large numbers of compatriots. This is true at least for the Irish and Polish immigrant groups. Further examination of the Irish lottery immigrants reveals that this greater concentration of the lottery immigrants is driven by older lottery immigrants. This must mean that the need for the presence of compatriots is stronger for older immigrants. This in turn could be because of the utility derived from compatriots or because of employment services provided by compatriots.

5) The data show a modest increase in the skill levels of immigrants over the 1980's. This is true even when changes in the mix of regions and changes in the mix of classes of admission are controlled for. The importance of this finding

is that it is contrary to the recent trend in immigrant quality and contrary also to the findings in Borjas (1994). The evidence is not clear that this observed increase in skill is a result of the increase in inequality in the U.S., since the experience is not uniform across regions. The region that would be most expected to show a reaction to the change in U.S. inequality, Western Europe, does, however, show the predicted movement in quality. This is some support for the prediction about the impact of inequality.

Section 3: Policy Conclusions

One of the arguments against allowing additional immigration is that immigrants do not possess characteristics that will lead them to make positive contributions to the U.S. economy. Such a concern was not much in evidence in the structure of immigration law until very recently. As described in Chapter 2, only a small proportion of greencards were issued on the basis of labor-market characteristics. During the 1980's, when almost 750,000 immigrants were being admitted each year, only 27,000 visas were set aside for the highly skilled. This was increased to 90,000 in the Immigration Act of 1990, so policy has partially caught up with public concerns.

A problem with this Act is that while it increases opportunities for the highly skilled to immigrate, it does little to discourage the immigration of the low-skilled or no-skilled. The evidence presented here shows that the countries which are the sources of these low skilled immigrants can be

identified. As such, it would be possible either to restrict immigration from these countries or to impose skill requirements for immigrants from them. These skill requirements need not be as stringent as the requirements that exist for those who are currently admitted on the basis of their skills but the law could impose some minimum requirement.

Proposals to treat different national groups differently may be politically unacceptable currently, making the proposal to restrict immigration from certain countries unworkable. The skill requirement approach could instead be imposed on all countries. The evidence presented in Chapters 2 and 4 shows that for some countries additional skill requirements would not alter the quality of the immigrant flow and would not act as a great impediment to immigration, since such countries send relatively highly skilled immigrants. The real impact of skill requirements would be felt by those countries which send low-skilled immigrants. This would be an example of a policy applying to all but affecting the few at whom it is really targeted.

The argument that restricting immigration from some countries and not from others is discriminatory is not entirely fair. Were the U.S. to restrict immigration from a particular country relative to other countries, it would not be saying that the people of that country were inferior. All that the U.S. would be saying is that the people of a country who find it optimal to immigrate are not the ones who would be

making a positive contribution to the U.S. This argument says nothing about the character of the people from a particular country in general. It merely says that relative conditions between the U.S. and this other country lead to the immigration of a particular sample. Restricting immigration from a country may make rational economic sense and should not necessarily be seen as discriminatory.

If immigration from certain countries is not restricted and no skill requirement are imposed, the U.S. will either have to live with an influx of unskilled immigrants or develop an immigration policy that extends to helping those who are here. The cost of restricted immigration or skill requirements is the dilution of the humanitarian goals of immigration policy. The cost of helping those here is the tax dollars required to set up training and education programs, etc. The cost of doing nothing will be difficult to estimate, but ideally the costs and benefits of each approach should be evaluated so that a sound policy can be pursued.

The goal of the lottery programs was to add diversity to the immigrant pool and specifically to generate additional immigration from countries that had been underrepresented in recent immigration waves. The change in the national origin mix of immigrants brought about the decline in the skill level of immigrants. The lottery programs, by altering the national origin mix, may help to raise the skill levels of immigrants. As was discovered in Chapter 3, however, the lottery programs also have an effect on immigrant quality by encouraging the

immigration of people who are more skilled than the family immigrants from the same country. These two positive effects of the lottery programs should be weighed against the negative one of the greater concentration of the lottery immigrants in a few locations.

Section 4: Ideas for Further Research

The results on the relative labor market quality of immigrants admitted under different classes of admission have emerged from a data set that is quite limited. The data do not have wage rates for each immigrant, nor do they have information on education or experience. While data sets taken from the Census and the C.P.S. have more detailed information on immigrants, these data sets do not indicate the class of admission under which the immigrant was admitted. A data set that included both class of admission and detailed individual information is needed to allow a much deeper investigation of the sort of issues explored here.

More detailed data on the lottery immigrants could be particularly valuable. This group represents a random sample of those in a country who want to immigrate. This is not necessarily true of those admitted under other classes of admission. Questions regarding positive or negative selection can be answered better using the lottery immigrants.

Even with the existing data advances can be made in this area. Since the occupational distribution of the lottery immigrants is available, it should be possible to compare the distributions of different national lottery groups with the

occupational distribution in each home country. This would act as a direct test of whether those who wish to immigrate are selected from the upper or lower part of the national income distribution.

The provision of the Immigration Act of 1990 which increased the number of immigrants granted admission based on high skill levels was intended to increase the average skill level of immigrants. The approach used in this dissertation could be used to examine the effect of this provision.

This dissertation began with a reference to the argument against immigration that views immigrants as lacking labor-market skills. The evidence presented here shows that such an argument is overly simplistic. Immigrant labor-market quality varies along a range of dimensions. The findings of this dissertation, along with the findings of other work in this area, should be used to inform the debate, so policy based on fact can emerge.

APPENDICES

Appendix A

Sources of Country Specific Data Used in the Regressions Presented in Table 4

Politically competitive system, recent loss of freedom and number of assassinations: Cross-National Time-Series Archive (CNTSA), a data set created by Arthur Banks and available through the Inter-University Consortium for Political and Social Research, Ann Arbor, MI 48106.

Income inequality: World Bank, World Development Report, various issues and United Nations, Compendium of Social Statistics, 1977.

Log per capita GNP: U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1972-1982, U.S.G.P.O. 1984.

Distance: Airline offices contacted by George Borjas

English proficiency: 5/100 sample of the 1980 Census

Appendix B

A Further Explanation of the Relationship between Mean Income in the Country of Origin and Selection

On page 535 of his A.E.R. paper Borjas presents the derivative of Q_1, the income differential between the average immigrant and the average native person in the United States, with respect to u_0, mean income in the home country. The derivative is:

$$dQ_1/du_0 = \sigma_1\sigma_0/\sigma_v^2 \ (k - \rho) \ \delta L/\delta z.$$

If k - p is negative the country is a negative selection country (see the condition derived in section 1 above) and this derivative is negative. Similarly, if $k - \rho$ is positive the country is a positive selection country (again, see the conditions in section 1) and the derivative is positive.

In order to understand the intuition behind this result, consider a negative selection country. The rise in mean income reduces the rate of immigration. Those that no longer find it optimal to migrate are those which were the most skilled of the immigrant pool from this country. Hence, the average quality of the pool falls. In the case of a positive selection, the increase in mean income also reduces the rate of immigration but this time it is the least skilled of the immigrant pool who no longer find it optimal to migrate. Hence the rise in average quality.

Appendix C

Rising Inequality and Rising Immigrant Quality

The following is an explanation of the comparative static result from that the Borjas model (1987b) which shows how a rise in inequality in a home country can lead to a rise in immigrant quality.

Relatively high levels of inequality will produce negative selection and relatively low levels will produce positive selection. Furthermore, the composition effect of a rise in inequality will always be to reduce immigrant quality.

The scale effect of a rise in inequality can produce a complication. If average income in the U.S. is less than the sum of average income in the home country plus the cost of migration, the scale effect of a rise in inequality will be to increase immigrant quality. For a rise in inequality to produce an overall rise in immigrant quality the relative mean income condition would have to hold and the scale effect would have to be bigger than the composition effect.

LIST OF REFERENCES

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1. **Bartel, Ann and Koch, Marianne**, "Internal Migration of U.S. Immigrants", in Abowd, John and Freeman, Richard (eds.) Immigration, Trade and the Labor Market 1991.

2. **Borjas, George**, "Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants", Journal of Labor Economics vol. 3 no. 4 (1985).

3. **Borjas, George** (1987a), "Immigrants, Minorities, and Labor Market Competition", Industrial and Labor Relations Review vol. 40 no. 3 (April 1987).

4. **Borjas, George** (1987b), "Self-Selection and the Earnings of Immigrants", American Economic Review vol. 77 no. 4 (September 1987).

5. **Borjas, George**, Friends or Strangers: The Impact of Immigrants on the U.S. Economy 1990.

6. **Borjas, George**, "Immigration and Self-Selection", in Abowd and Freeman (eds.) 1991.

7. **Borjas, George**, "What Happened to Immigrant Skills in the 1980's?" Mimeograph March 1994

8. **Borjas, George, Freeman, Richard and Katz, Lawrence**, "On the Labor Market Effects of Immigration and Trade" in Borjas, George and Freeman, Richard (eds.) Immigration and the Workforce: Economic Consequences for the United States and Source Areas 1992

9. **Borjas, George and Trejo, Stephen**, "Immigrant Participation in the Welfare System", Industrial and Labor Relations Review vol. 44 no. 2 (January 1991).

10. **Borjas, George and Trejo, Stephen**, "National Origin and Immigrant Welfare Recipiency", Journal of Public Economics vol. 50 no. 3 (March 1993).

11. **Bureau of Labor Statistics**, Employment and Earnings January 1990.

12. **Carliner, Geoffrey**, "Wages, Earnings and Hours of First, Second and Third Generation American Males", Economic Inquiry vol. 18 (January 1980).

13. **Chiswick, Barry**, "The Effect of Americanization on the Earnings of Foreign-born Men", Journal of Political Economy vol.86 no. 51 (1978).

14. **Funkhouser, Edward and Trejo, Stephen**, "The Labor Market Skills of Recent Male Immigrants: Evidence from the Current Population Surveys", Mimeograph, October 1993.

15. **House of Representatives**, Report 100-1038.

16. **Jasso, Guillermina and Rosenzweig, Mark**, "What's in a Name? Country-of-origin Influences on the Earnings of Immigrants in the United States", Research in Human Capital and Development: Migration, Human Capital and Development vol. 4 (1986).

17. **Katz, Lawrence and Loveman, Gary**, "An International Comparison of Changes in the Structure of Wages: France, the United Kingdom and the United States, Mimeograph 1990

18. **LaLonde, Robert and Topel, Robert**, "Immigrants in the American Labor Market: Quality, Assimilation and Distributional Effects", A.E.A. Papers and Proceedings (May 1991).

19. **McManus, Walter, Gould, William and Welch, Finis**, "Earnings of Hispanic Men: The Role of English Language Proficiency", Journal of Labor Economics vol. 1 (April 1983).

20. **Roplh, Elizabeth**, Immigration Policies: Legacy from the 1980's and Issues for the 1990's Rand 1992.

21. **Schwartz, Aba**, "Interpreting the Effect of Distance on Migration", Journal of Political Economy vol. 81 no. 5 (September/October 1973).

22. **Topel, Robert**, "Regional Labor Markets and the Determinants of Wage Inequality", A.E.A. Papers and Proceedings May 1994

21. **World Bank**, World Development Report, various issues.