DIVERSITY AND IMMIGRATION

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ABSTRACT

One of the economic benefits of immigration is that the diversity of the population is enhanced. Diversity, it is argued, enriches the environment in which individuals live and trade and may contribute to greater creativity. What does diversity mean? Do current immigration policies enhance diversity? To the extent that there are gains from diversity, they come through the interaction of individuals from one culture or background with individuals from another. A good partner in the interaction has different skills, has skills that are relevant to one's own activity, and is a person with whom one can communicate. The argument in favor of diversity is evaluated both theoretically and empirically using the 1990 Census. Diversity cannot be the justification of U.S. immigration policy. Indeed, current immigration policy fails to promote diversity. Further, the results suggest that our immigration policy has resulted in differences in the characteristics of immigrants that reflect the effects of selection as much as they do the underlying characteristics of the populations from which the immigrants are drawn. Balanced immigration, perhaps implemented through the sale of immigration slots, would do more to enrich the diversity of the US population.

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A growing number of studies are attempting to document the effect of immigration on wages of native born Americans.[1] The emphasis has been on a corollary of standard trade theory. The idea is that the immigrant is paid his marginal product. The inframarginal returns are captured by the complementary factors of production, in this case, natives, who own the capital and complementary labor. The focus on wage effects of immigration is a natural consequence.

Most proponents of immigration, however, argue for the diversity value that immigration confers on the United States. The stew tastes better when the ingredients are varied. The notion that the whole is greater than the sum of the parts derives from interactions between factors that somehow add to creativity or other components of output, not captured by the standard production function.

There is something to this argument. It would be surprising to find large gains from immigration associated with bringing in more skilled or unskilled workers. Skill is easily arbitraged by new native born entrants to the labor market. The limit on the difference between the gains to bringing in a skilled v. unskilled immigrant is the cost of producing a skilled worker from an unskilled one domestically.

In the traditional model, the gain from immigration results from increases in the population. which enhances the value of capital or other factors owned by natives. There is nothing special about immigration. The argument in favor of immigration is identical to arguing that society benefits

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[1]Borjas (1994) points out that the gains from immigration accrue to the native population precisely when wages are depressed by the entry of immigrants. Studies of the effects of immigrants on natives wages include LaLonde and Topel (1991), Card (1990). The studies generally find small, if any, effects of immigration on the wages of natives.

when everyone has more children because the child will only capture his marginal product. Inframarginal returns flow to capital and other labor owned by his parents or their contemporaries. Selecting the skill level of immigrant is equivalent to determining whether we want more children who will grow up to be skilled workers or unskilled workers.[2]

Even if constant returns to scale prevails, and even if each immigrant brings with him a proportionate amount of new capital, land is fixed and owned by the native population. Any population increase, natural born or immigrant driven, causes the value of land to rise, benefitting the native population.

Fans of immigration might claim that this misses the point. It is possible to argue that gains from immigration derive from having a wider economic "gene pool." With less "inbreeding," our ideas may be better and more creative and we are less likely to exacerbate our mistakes. Although politically correct to accept the view that diversity provides benefit, there are few studies to document the magnitude of the gains or even that such gains exist.[3]

Diversity surely carries its costs. Because individuals from different cultures have a more difficult time communicating with one another, diversity reduces trade, at least initially. Lazear (1997) analyzed the effects of diversity on trade reduction, but ignored any gains to diversity, per se. If the value of diversity is sufficiently large, then perhaps some of the arguments against a

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[2] There is an additional factor. Since parents may care about the well-being of their children more than they do about the well-being of an anonymous immigrant, the wages of the child may enter into the calculation of happiness for the native, i.e., parent population.

[3]See O'Reilly, Williams, Barsade (1998), who find that the gains from diversity are in fact negative. Because diversity creates conflict, any creativity gains are swamped by those associated with the conflict itself.

Weitzman (1992) models biodiversity. He finds that society does not subsidize the right species in maximizing biodiversity. Other factors, including the "cuteness" of the animal in question, are considerations.

heterogeneous workforce could be mitigated or reversed.

The analysis that follows attempts to take the diversity argument seriously. In some sense, it has a *reductio ad absurdum* flavor, both at the theoretical and empirical levels. The conclusion is not that certain countries should be favored because of their contribution to diversity, but rather that the current policy, which has the effect of favoring certain countries, does not enhance diversity. An alternative policy that leads to more balanced immigration would further diversity.

The theoretical analysis builds on the idea that the gains from diversity are greatest when groups have information sets that are disjoint,[4] that are relevant to one another, and that can be learned by the other group at low cost.[5] A more formal model will be presented below, but the intuition can be stated verbally.

First, the diversity gains are greatest when individuals have different information. If information sets are completely disjoint, then members of group A can learn a great deal from group B that they do not already know. If information sets are completely overlapping, then the two groups do not contribute much to each other's knowledge.

Second, the information possessed by the other group must be relevant. For example, the knowledge that an auto mechanic has is quite different from that held by an economist. The information sets are quite distinct and thereby meet the disjointness criterion. But they are not relevant to one another. Knowing how to repair the differential on 1963 Buick in unlikely to help an economist analyze wage differentials.

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[4]Hong and Page (1997) focus on the gains from diversity that come about when different agents, each of whom possess limited ability, work collectively.

[5]An informal presentation of these ideas is in Lazear(1998), pp. 310-15

Third, even if information sets are disjoint and relevant, they are useless unless they can be understood by the other group. For example, it might be better to express a particular thought in French than it is in English, but in order for English speakers to get the benefit of this improvement, they must be able to understand French themselves. If it were prohibitively costly to learn the language or obtain the information possessed by the other group, then disjointness and relevance would have no value.

Diversity is modeled and applied analyze the choice of immigrant populations. Data from the 1990 Census are used to estimate the parameters of the model. The findings are:

1. The current US immigrant flow is inconsistent with the diversity. To obtain gains from diversity, it would be necessary to institute a selective immigration policy that eliminates relative-based preferences for immigrants and replaces them with a much more targeted approach. Current American residents may have preferences for their own relatives, per se, but the diversity argument for immigration does not bolster their claims.

2. Ironically, a preference for diversity does not imply a diverse population. When trade with unlike individuals is more valuable than trade with like individuals, the initial population may prefer a homogeneous population of the opposite type. Sale of immigration slots or other transfers may be able to induce the initial population to prefer a heterogeneous population.

3. Groups differ greatly in communication propensity, disjointness and relevance, the three criteria by which a diverse population can be judged. The current group of immigrants does not do well by any of these criteria. It is possible to select immigrants on the basis of characteristics that would enhance diversity and be consistent with the preferences of the majority of the initial population.

4. Education is an important characteristic, both on the basis of relevance and for communication. As such, an immigration policy that fails to ration slots by price while ignoring the education of immigrants is unlikely to further welfare enhancing diversity.

5. Immigration policy, more than the underlying characteristics of the countries from which the immigrants are drawn, determines the quality of immigrants observed in the U.S. Because the filters are different across groups, immigrants from Japan have lower average levels of education than immigrants from Northern Africa countries, which is inconsistent with differences in average levels of education in the countries themselves.

6. Balanced immigration, which increases the speed of assimilation, also raises gains from diversity.

The Model

Let us suppose that there are two groups, A s and B s. A s have knowledge that spans an interval A_0 to A_1, while B s have knowledge that spans an interval B_0 to B_1. The intervals may be overlapping and the ordering is not important. It is the size of the interval and its overlap that is most important. For simplicity, we reduce knowledge to a scalar variable, x. This is shown in figure 1. For example, suppose that the information in question relates to literatures. Then A knows all the papers on interval A, B knows all the papers on interval B, and they both know paper on interval

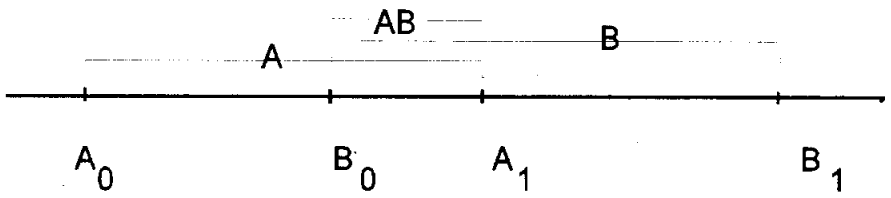
AB. As in Lazear (1997), the model is one of random encounter. An individual can encounter one individual per period. This individual is either an A or a B. Initially assume that individuals encounter others based on their proportions in the population, i.e., there is no segregation of groups. When an A encounters another A, he can trade with each A receiving surplus equal to

(1) Surplus to each A = $A_1 - A_0$.

Trade with another A can yield surplus because two heads or bodies may be better than one, even when they have the same skills or information. For example, it might be impossible for one person to push a stalled car, but two identical individuals can complete the task.

Figure 1

Knowledge



When a B encounters another B, she can trade with the B, and each B receives surplus equal to

(2) Surplus to each B = $B_1 - B_0$.

Trade between As and Bs may create more or less surplus than trade between homogeneous individuals. The surplus could be greater in a heterogeneous pair than in a homogeneous one because the information sets do not overlap completely.[6] As learn B's information which enhances the value of the trade. If B's information were as valuable to A as another A's information, and vice versa, then trade with a B would yield each trader B_1-A_0 of surplus, which exceeds the value of trade between two homogeneous individuals. The less overlap in information sets, the better. This illustrates that trade is enhanced when the information sets of trading parties are disjoint.

Trade between As and Bs might create less surplus than trade between homogeneous pairs. If the information that Bs possess is irrelevant to As activity, then an encounter with a B would not be valuable to an A. Define θ as a relevance parameter. When θ=1, everything that B knows is relevant to A. Then a trade between an A and a B yields surplus $B_1 - A_0$ to each trading party. When θ=0, nothing that B knows is relevant to A. It is possible to define θ as unidirectional. Just because B's information is relevant to A does not mean that A's information is relevant to B. Allowing group-specific relevance parameters would add some realism, the possibility is ignored to conserve on notation.[7] In general then, surplus between an A and B who can communicate with one another is given by

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[6]It is assumed that B_0 is never greater than A_1 to simplify the algebra. This is inessential to any of the results.

[7]Logic places a lower bound on θ. If communication were not an issue, then the proportion of B's information that overlaps with A's must be relevant in order to be consistent with the notion that trade between two As yields value $A_1 - A_0$ to each party. Since the overlap is $A_1 - B_0$, the lower bound on theta is $(A_1 - B_0) / (B_1 - A_0)$.

(3) Surplus to each party from diversified trade = $\theta (B_1 - A_0)$.

Third, even if B's information is different and relevant to A, B and A must be able to communicate in order to share the information.[8] If A and B speak different languages, then either A must learn to speak B or B must learn to speak A (or both) in order to share information. Thus, disjointness, relevance, and communication costs determine the value of diversity.

The costliness of communication is modeled by assuming that there is a cost, k_i , for individual i to learn the other language. The distribution function of k is $G_A(k)$ among the As, and $G_B(k)$ among the Bs. It is possible that G_A and G_B are identical, but it is also possible that it is easier for Bs to learn A than for As to learn B, or for the converse to hold.

It is now possible to determine how many individuals will learn A and how many will learn B. This depends on the probability of encountering an individual from the opposite group, on the costs of learning, and on the proportion of the opposite group that is bilingual. There is no need for English speakers to learn Spanish if all Spanish speakers also speak English.

Assume only one period. Given that p of the population is A and 1-p is B, the expected surplus to a monolingual A is then

(4) Expected Surplus to Monolingual A = $p (A_1 - A_0) + (1-p) G_B^* \theta (B_1 - A_0)$

where G_B^* is the equilibrium proportion of Bs who can speak A. The first term on the r.h.s. is the

[8]This is related to the "committee" problem. A large committee possesses more information than any of its individual members, but as the committee gets large, it becomes impossible to communicate the information. One individual's words drown out another's. This is discussed in Lazear (1998), especially Chapter 12.

probability of meeting an A times the surplus associated with meeting an A. The second term on the r.h.s.reflects the probability of meeting a B times the surplus associated with meeting a B who can speak A, which depends on disjointness and relevance.

Further, the expected surplus to a bilingual A is

(5) Expected Surplus to Bilingual A = $p (A_1 - A_0) + (1-p) \theta (B_1 - A_0) - k_i$

because all encounters with Bs result in trade. Note that the cost of learning B is subtracted off from the gains from trade.

Analogously, the expected surplus to a monolingual B is

(6) Expected Surplus to Monolingual B = $(1-p) (B_1 - B_0) + p G_A^* \theta (B_1 - A_0)$

and to a bilingual B is

(6) Expected Surplus to Bilingual B = $(1-p) (B_1 - B_0) + p \theta (B_1 - A_0) - k_i$.

Gains from Diversity

Since As are in the majority, and since most As, as an empirical matter, are monolingual, at least in the current stock of Americans, let us consider whether a monolingual A prefers to meet an A or a B. This gets to the heart of the diversity issue. Normalize $A_1 - A_0$ to be equal to 1. Assume, initially, that $B_1 - B_0$ is equal to $A_1 - A_0$ so that As and Bs receive the same value from trading among themselves.

The difference between meeting a B and an A to a monolingual A is given by

(7) Difference in Value of Meeting B instead of an A $= \theta G_B^*(B_1 - A_0) - (A_1 - A_0)$

$= \theta G_B^*(2 - \Delta) - 1$

where Δ is defined as $A_1 - B_0$ and is a measure of overlap, which is the complement of disjointness.[9]

The intuitive statements made earlier come directly from differentiating (7). First note that

$\partial/\partial\Delta = -\theta G_B^* + \theta(2-\Delta)\ \partial G^*_B/\partial\Delta$.

Both terms are negative because $\partial G^*_B/\partial\Delta$ is negative (from (9) below). As overlap decreases, i.e., disjointness increases, so does the gain to diversity. When As can learn more from Bs, they are more anxious to encounter Bs.

Second,

$\partial/\partial\theta = G_B^*(2 - \Delta) + \theta(2-\Delta)\ \partial G^*_B/\partial\theta$.

Both terms are positive because $\partial G^*_B/\partial\theta$ is positive (from (9) below) . As relevance rises, so does the advantage of meeting a B over an A.

Third,

$\partial/\partial G_B^* = \theta(2-\Delta) \geq 0$.

When more Bs can communicate with As, the gain to a monolingual A from meeting a B is greater.

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[9]If As and Bs were identical and all Bs spoke A, then θ would equal 1, Δ would equal 1 and this expression would be equal to zero.

The cost of learning A is a key determinant of G_B^*, so as more Bs find it cheap to learn A, the As' gains from diversity rise.[10]

Now, the names A and B are arbitrary, except that As have been defined to be the majority by declaring that $p>1/2$. But nothing in the above derivation has relied on the fact that $p>1/2$. Thus, all statements that relate to As also relate to Bs. Specifically, Bs prefer to interact with As when Δ is low. That is, the As' information is disjoint from the Bs' information in the sense that As know much that Bs do not know. Further, Bs' preference for interaction with As rises with θ, the relevance of the As' information. Finally, as G_A^*, the proportion of As who can speak B, rises, the Bs' preference for As' rises. Again, as the cost to As of learning B declines, the Bs gain from diversity rises.

Parochialism

It is useful to consider the conditions under which Bs learn A and vice versa. When are groups cosmopolitan and when are they parochial? First, let us consider when a member of the minority will learn A. Taking the difference of (6) and (5), the gain to a B from becoming bilingual is

(8) Gain to a B from learning A = $p\,\theta\,(1-G_A^*)\,(B_1 - A_0) - k_i$

[10]Differentiating with respect to G^*_B should be interpreted as a change in the underlying costs of learning a language, which shows up as a change in the equilibrium number of individuals who are bilingual.

so that the proportion of Bs who learn A are those for whom the r.h.s. is positive. Since the distribution function among Bs of k_i is $G_B(k_i)$, the proportion of Bs who learn A is

(9) Proportion of Bs who Learn A $= G_B (p\theta(1-G_A^*)(B_1 - A_0))$.

Analogously,

(10) Proportion of As who Learn B $= G_A ((1-p)\theta(1-G_B^*)(B_1 - A_0))$.

By differentiating (9) and (10), the following results obtain under general conditions.[11]

First, an increase in p, the proportion of As in the population, raises the proportion of Bs who learn A. This is the primary result of Lazear (1997). Because there are more As in the population, being able to speak A allows B to trade with more individuals, which is particular important when B is a small minority and A is a large majority.

Second, the larger is θ, the greater is the proportion of Bs who learn A. When As' knowledge is relevant, it pays for B to learn A.

Third, the smaller is G_A^*, the more likely is B to learn A. A small value of G_A^* means that few As speak B. Thus, the only way for B to trade with A is for B to learn A.

Finally, the proportion of Bs who learn A increases in $B_1 - A_0$, which equals $2 - \Delta$. As the region of information overlap falls, that is, as disjointness rise, so does the value of trading with an A. B types or more likely to learn A when overlap in information is small.

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[11]The necessary condition is that $p(1-p)\Delta^2\theta^2 g_A g_B < 1$ which is certain to hold as p goes to 0 or 1.

The population becomes less parochial when disjointness of information is large, when the other group's information is relevant, and when the cost of communication are low.

Diversity and the Choice of Immigrant Type

It is now possible to consider the primary question. Is there a diversity case for immigration? Let us start by determining which type of individual a country would like to have immigrate.

Initially, there are four types of people in the country. They are monolingual As, bilingual As, monolingual Bs and bilingual Bs. We assume an egalitarian social welfare function that treats each individual equally and maximizes the sum of surplus across all individuals.

Initially, there are α As and $(1-\alpha)$ Bs. The equilibrium population will have p As and (1-p) Bs. The goal is to choose p so as to maximize the welfare of the initial population. Utility of immigrants is ignored.[12]

The utility of an A is given by

(11) a. Utility of monolingual A = $p(A_1 - A_0) + (1-p)G_B^* \theta(B_1 - A_0)$

b. Utility of bilingual A = $p(A_1 - A_0) + (1-p)\theta(B_1 - A_0) - k_i$

and that of a B is given by

(12) a. Utility of monolingual B = $(1-p)(B_1 - B_0) + pG_A^* \theta(B_1 - A_0)$

[12]This is not unreasonable since immigrants who come voluntarily are at least made better off by immigration. Further, since they can choose among many countries, competition will induce them to go to the country that provides the best ratio for them, other things constant.

b. Utility of bilingual B = $(1-p)(B_1-B_0)+p\theta(B_1-A_0)-k_i$

Since there are α As and $(1-\alpha)$ Bs, the expected utility of the initial population as a function of p, the equilibrium proportions, is

$$(13)\quad EU(p) = \alpha\{[p(A_1-A_0)+(1-p)G_B^*\theta(B_1-A_0)](1-G_A^*)+[p(A_1-A_0)+\theta(1-p)(B_1-A_0)-\bar{k}_A]G_A^*\}$$

$$+\quad (1-\alpha)\{[(1-p)(B_1-B_0+pG_A^*\theta(B_1-A_0)](1-G_B^*)+[(1-p)(B_1-B_0)+p\theta(B_1-A_0)-\bar{k}_B]G_B^*\}$$

where G_A^* and G_B^* refer to the equilibrium proportions of As and Bs who learn the other groups language and where $\bar{k}_A$ and $\bar{k}_B$ are the conditional expectations of k_i, the average cost of learning the language, for As and Bs, respectively, given that they learn the other language. The four terms reflect the utilities of monolingual As, bilingual As, monolingual Bs and bilingual Bs, weighted by their proportions in population.[13]

To find the optimum p, it is necessary to differentiate (13) with respect to p. Intuition is gained, however, by considering some specific cases. First, suppose that it is too costly for either As or Bs to learn the other group's language. Then, $G_A^* = G_B^* = 0$, and (13) becomes

$$\alpha p(A_1-A_0) + (1-\alpha)(1-p)(B_1-B_0)$$

Differentiating with respect to p yields

[13]The proportions, G, depend on equilibrium levels, whereas α is the fixed, initial proportion.

$$\frac{\partial}{\partial p} = \alpha(A_1 - A_0) - (1-\alpha)(B_1 - B_0)$$

which is positive as long as $\frac{\alpha}{1-\alpha} > \frac{B_1 - B_0}{A_1 - A_0}$. For $B_1 . B_0 \leq A_1 - A_0$, this is guaranteed because $\alpha > ½$. Then $\partial/\partial p$ is always positive, which means that the optimum level of p is 1. If society were to seek immigrants, it would want those who mimic the majority. Under these circumstances, there is no diversity case for immigration. In fact, the reverse is true. Immigration is valuable, but it is because immigration of majority types would increase homogeneity in society. Homogeneity is the desired outcome when individuals cannot trade with members of the opposite group. Because the As cannot speak B and the Bs cannot speak A, it is best to have only one type of individual. Since As are initially the majority, welfare maximization implies admitting only As. Under these circumstances, Bs, who cannot communicate with As, will push for more Bs. A consequences is that quite divergent views about immigration policy are likely to result.

The divergence in views is, in part, a result of linearity built into the model. There are no diminishing returns to As from getting more As. The gains from trade are independent of the number of individuals who have the relevant skills. If diminishing returns were allowed, corner solutions would be less likely.

The strongest case for immigration of minority members can be made when disjointness, relevance, and inexpensive learning prevail. Consider, then, the other extreme, where the cost of learning the other group's language is zero for all individuals. Then, $G_A^* = G_B^* = 1$. [14] Eq. (13) is then

[14]In fact, it is only necessary that one group become bilingual.

$$\alpha[p(A_1-A_0)+\theta(1-p)(B_1-A_0)]+(1-\alpha)[(1-p)(B_1-B_0)+\theta p(B_1-A_0)]$$

Differentiating with respect to p yields

(14) $$\frac{\partial}{\partial p} = \alpha[(A_1-A_0)-\theta(B_1-A_0)]+(1-\alpha)[\theta(B_1-A_0)-(B_1-B_0)] \quad .$$

Suppose, for a moment, that As and Bs have equal information. Then (14) becomes

$$\frac{\partial}{\partial p}=(2\alpha-1)[1-(B_1-A_0)\theta]$$

or

$$\frac{\partial}{\partial p} = (2\alpha-1)[1-(2-\Delta)\theta] \quad .$$

Since $\alpha > ½$, the first term is positive. If θ were zero, so that opposite group's information were irrelevant, then ∂/∂p would always be positive and the optimal p would be 1, as in the case where no one learns the other group's language. Suppose, however that everything that the other group knows is relevant so that $\theta = 1$. As long as there is any disjointness at all, i.e., as long as overlap is not perfect so that $\Delta<1$, the second term is negative, which implies that $\partial/\partial p < 0$ for all values of p. This means that the optimal long run population would have p=0. The initial population would prefer to allow only Bs to immigrate because As get more out of Bs than they do out of As and there are more As than Bs in the initial population.

This produces a surprising implication. Even if there were gains from diversity that

outweighed those of trading with one's own type, the implication is that the initial society would want a population of all Bs, not a diverse population. Homogeneity would be desired, but it would be homogeneity of types in the minority of the initial population. Furthermore, it would be the As who would prefer this movement to Bs; the Bs would prefer an opposite movement to As. The reason is that As prefer trading with Bs, and vice versa. Since there are more As initially, their preferences win out and the optimum is to admit only Bs.

The general point is that even when the initial population cares about diversity, it prefers a specific population, not necessarily a diverse population. In some cases, the population preferred by the initial diversity-loving population, may be almost completely homogeneous.

It is, of course possible to build in a taste for having a mixed society, just for mixture's sake, but there is no underlying reason for this that comes from the usual arguments having to do with the value of diversity. The enriching value of dealing with other types of people is the basis of the model. To assume a taste for diversity on top of this seems a stretch.

Immigration and Income

Suppose that we are interested in maximizing GNP or GNP per capita by choosing the number and type of immigrants. Would the solution be the same as that derived above? In general, the answer is no and the discrepancy between the results in this section and those in the last come about because transfer payments from one group to another have not been allowed.

To maximize GNP per capita, it is sufficient to choose p so as to maximize the net income

of the average individual in society, as opposed to the net income of the initial population, which was the criterion expressed in (13). To do this, it is necessary to choose p to maximize

$$(15)\quad EU(p) = p\{[p(A_1-A_0)+(1-p)G_B^*\theta(B_1-A_0)](1-G_A^*)+[p(A_1-A_0)+\theta(1-p)(B_1-A_0)-\bar{k}_A]G_A^*\} +$$

$$(1-p)\{[(1-p)(B_1-B_0)+pG_A^*\theta(B_1-A_0)](1-G_B^*)+[(1-p)(B_1-B_0)+p\theta(B_1-A_0)-\bar{k}_B]G_B^*\}$$

The only difference between (13) and (15) is that α is replaced by p in (15) to reflect that we wish to maximize the net income of the average individual in society.[15] First consider the case where learning is free, so that $G_A^* = G_B^* = 1$. Also, assume neutrality so that $A_1 - A_0 = B_1 - B_0 = 1$. Then (15) becomes

$$(16)\qquad EU(p) = p^2+(1-p)^2+2p\theta(1-p)(2-\Delta)$$

Differentiating with respect to p yields

$$\partial/\partial p = (4p-2)[1 - (2-\Delta)\theta]$$

and again,

$$\partial^2 / \partial^2 p = 4\,[1 - (2-\Delta)\theta] \quad .$$

The solution to the first order condition is p=1/2. This is a maximum when $(2-\Delta)\theta > 1$, or

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[15]Additionally, k changes because the group of individuals that decides to learn the other language varies with the proportions of each type in the overall population.

when trading with unlike individuals has more value than trading with like individuals. When diversity has value and is free, the optimal solution for the economy is to choose immigrants to move in the direction of p=1/2. Since $\alpha > \frac{1}{2}$, this necessarily means that minority immigrants are preferred to majority ones.

This result contrasts with that in the previous section, where the utility of the initial population, rather than overall GNP was allowed. The reason is this. When trading with unlike individuals is better than trading with like individuals, As want Bs and Bs want As. But since there are more As than Bs in the initial population, maximizing the utility of the initial population pushes the outcome to p=0, with all Bs (other than the initial group of As). This does not maximize GNP. Since it does not, it is inefficient and there is opportunity for trade. One way to deal with the discrepancy is to sell immigration slots, discussed below.

It is possible that trading with unlike individuals has less value than trading with like individuals. Then, the second order condition implies a minimum. Because it was assumed that As and Bs have the same amount of knowledge, i.e., $A_1 . A_0 = B_1 - B_0 = 1$, GNP is maximized by choosing either p=0 or p=1. The tie is broken when one group has more information than another. Suppose, for example, that As are more educated than Bs and that education is positively correlated with information and the value of trade. Then this would tip the balance in favor of As. The value of EU(p) in (16) would be maximized at p=1. Allowing $A_1 - A_0$ to differ from $B_1 - B_0$ turns (16) into

$$(17) \quad EU(p) = p\,[\,p(A_1 - A_0) + (1-p)(2-\Delta)\,] + (1-p)[(1-p)(B_1 - B_0) + p(2-\Delta)] \ .$$

with first order condition

(18) $\partial/\partial p = 2p(A_1 - A_0) - 2(1-p)(B_1 - B_0) + (2-4p)(2-\Delta)\theta$.

Setting (18) equal to zero yields

$$p = \frac{(B_1 - B_0) - (2-\Delta)\theta}{(A_1 - A_0) + (B_1 - B_0) - 2(2-\Delta)\theta}$$

which solves for p = ½ when Bs and As are symmetric. But if Bs have less knowledge than As, then p moves closer to 1. Some diversity may still be desired. For example, if $A_1 - A_0 = 1.5$, $B_1 - B_0 = .5$, $\Delta = .25$, and $\theta = 1$, then the p that maximizes GNP is 5/6. There is a strong bias toward As, but complete homogeneity is not desirable.

At the other extreme, when no learning occurs so that $G_A^* = G_B^* = 0$, (15) becomes

$$EU(p) = p^2 (A_1 - A_0) + (1-p)^2 (B_1 - B_0)$$

which is maximized by setting p=1 if As know more than Bs and p=0 if Bs know more than As. The society should be completely homogeneous because no trade takes place between unlike individuals.[16]

The conclusion of this section is that without transfer payments, the initial population would actually choose immigrants of the opposite type were diversity important. Allowing transfer payments from the new immigrants to the native born population generally produces an interior

[16]A solution is to have the the group that gets the most out of being in the country "buy out" the other group.

solution, but one that favors the group with the most information and skill.

Selling Immigration Slots

It has been shown that diversity enhancing immigration may be opposed by the weighted average individual in the initial population[17] even when it would increase overall GNP. Whenever this occurs, there is room for trade. But the ability to buy out the initial population depends on the number of immigrants that a country can attract and on the population size that is to be tolerated.

If there is a sufficiently large supply of As who are willing to immigrate under optimal conditions, and of Bs who would immigrate even under the solution preferred by the current population, then it is always possible to for Bs to bribe the initial group of As into implementing the GNP maximizing immigration policy. To see this, denote by R_A* the surplus that goes to each A under the GNP maximizing strategy and by R_B* the surplus that goes to each B under the GNP maximizing strategy. Denote by R_A' the surplus that goes to each A under the current population preferred solution, and analogously for R_B' for Bs. Also, let p* and p′ be the equilibrium proportions under the two regimes. The proof that transfers exist, which make all better off, follows.

Since the average person is better off when GNP is maximized, it must be true that

$$R_A^* p^* + R_B^* (1-p^*) > R_A' p' + R_B' (1-p')$$

or that

[17]It is also true that it will be opposed by the median voter since As are the majority.

$$(R_B^* - R_B')(1 - p') > (R_A' - R_A^*)p^*.$$

This implies that

(19) $$(R_B^* - R_B')\frac{B_0 + \dot{B}}{A_0 + B_0 + \dot{A} + \dot{B}} > (R_A' - R_A^*)\frac{A_0}{A_0 + B_0 + \dot{B}}$$

where A_0 and B_0 and are the initial numbers of As and Bs and where $\dot{A}$ *and* $\dot{B}$ are added to obtain p' in the population. If (19) holds, then it must also be true that

$$(R_B^* - R_B')(B_0 + \dot{B}) > (R_A' - R_A^*)A_0.$$

But this condition says that if each B pays $R_B^* - R_B$, this will compensate every initial A for the loss in moving to the GNP maximizing solution instead of that chosen by the initial population. However, any B who would immigrate when there are p′ As will certainly move when there are p* As. Also, if there is a sufficient number of As who are willing to immigrate under optimal conditions without compensation, the p* equilibrium can be achieved. This completes the proof.

Interdisciplinary Research

Before considering the empirical evidence, the reader is asked to tolerate a slight digression.

The model of the previous section may be used to analyze interdisciplinary research. The argument in favor of the interdisciplinary approach is that new ideas are created when trade occurs between individuals with unlike training or experience. This is a direct application of disjointness. If the overlap between two fields is low, then one researcher can learn much from another. Interdisciplinary work is most productive when the information that one researcher has is not also possessed by the other researcher. In the context of the model, interdisciplinary work seeks to maximize the size of $B_1 - A_0$. When the work is within a very narrow discipline, trade is over the information set $A_1 - A_0$,

which is substantially smaller than $B_1 - A_0$ when the overlap, Δ, is small.

Also important is that the information held by the other must be relevant. It is for this reason that economists are more likely to collaborate with sociologists or psychologists than they are with marine biologists. The value of θ is higher for interaction between economists and psychologists than it is between economists and marine biologists.

The major impediment to interdisciplinary work is that communication is more difficult between individuals who are in different fields. Most psychologists do not speak economics, and vice versa. It takes time to learn the jargon that belongs to another field. Sometimes, it pays to learn the jargon. A sociologist who works in a modern business school must speak some economics because the community tends to be dominated by those who use large amounts of economics in their work. The reverse is not true. Business school sociologists are more likely to be "bilingual" than are business school economists. This follows directly from (9) and (10) and from the fact that the majority group are economists.

Economists sometimes work with engineers. There is significant disjointness in the two

fields, but the languages, using similar kinds of mathematics, are not so different to impede communication. Additionally, some continue to hope that relevance is high across the two fields.

The analogy also carries over to computer programs. An individual who knows WordPerfect can easily learn Word. Similarly, a Lotus expert can quickly become conversant in Excel. But Lotus and Excel are not disjoint. It is better for a team to consist of one person who knows either WordPerfect or Word, and one person who knows either Lotus or Excel than to have a team with one WordPerfect expert and one Word expert. Even though communication is cheaper, disjointness carries the day.

The Empirical Case for Diversity

Theory suggests a way by which having a diverse population can enhance the gains from trade. There are costs of diversity, however, in that communication is hindered when everyone does not speak the same language. Do the gains from diversity outweigh the costs?

To determine whether the argument for diversity any empirical substance, the 1990 Census of the United States (1/100 sample) was used. Data are provided on place of birth, ancestry, English fluency, language spoken at home, and standard variables such as age, education, race and sex.

It is possible to get a sense of how reasonable the diversity argument is by considering the largest non-English speaking group in the U.S., namely Spanish speakers. Forty-eight percent of those in the 1990 Census who were born outside the US are Spanish speakers. Of those, 55% report that they speak English well or very well, which will be defined as fluent. Almost all of the native born population, which is over 90% of the U.S., speaks English as its first language. Few in this

group speak Spanish. Those who do are for the most part children of Spanish speaking immigrants. Thus, for all intents and purposes, communication does not occur between a native born American and a Spanish speaking immigrant unless the immigrant is fluent in English. This means that $G_A^* = 0$ and $G_B^* = .55$.

A necessary condition for the diversity case is that trade between an A and a B results in greater expected surplus than that between an A and A. Defining As to be all of the English speaking, native born population and Bs to be the Spanish speaking immigrants, it is necessary then that

$$\theta (B_1 - A_0) G_B^* > (A_1 - A_0)$$

or that

(20) $$\theta (B_1 - A_0) > 1 / G_B^* .$$

Given that $G_A^* = .55$, expression (20) can be written as

(21) $$\theta (B_1 - A_0) > 1.82 .$$

Unless the gains from trading across groups exceeds the normalized 1.82, within group interaction dominates between group interaction.

Now, (21) is a very difficult condition to meet. To see this, consider a quite extreme situation. Suppose, first, that immigrants have neither more nor less information than do native borns, so that $(B_1 - B_0) = (A_1 - A_0) = 1$. Suppose, further that information is almost completely disjoint, with only 10% overlap, so that $(B_1 . A_0) = 1.9$. This assumption is very favorable to the diversity case. Also suppose that almost all of the information that each side possesses is relevant to the other side. Specifically, As find all of the information between A_0 and A_1 relevant and 90% of the information between A_1 and B_1 relevant. Then the relevance parameter is over the interval

$B_1 - A_0$ is

$$\theta = 1\ (1/1.9) + .9\ (.9 / 1.9) = .9526 \quad .$$

Under these circumstances,

$$\theta\ (B_1 - A_0) = (.9526)(1.9) = 1.81.$$

Trade between unlike types is not sufficiently valuable to satisfy condition (20). The expected value of diversity is negative.

Intuitively, since only about half of the immigrants can communicate with the native born population, each actual trade between immigrant and native born needs to be worth almost twice as much as that between two native borns in order to make the value of diversity positive. It is difficult to imagine that the value of the typical trade between native born and immigrant is almost twice that of the typical trade between two native borns. Although possible, the conditions under which diversity pays are very strict.

The main reason for this somewhat negative conclusion is that Spanish speaking immigrants are not very likely to learn English. Were G_B^* close to 1, the requirement in (20) would be much easier to satisfy. This suggests that it is useful to look empirically at how G^*, $B_1 - A_0$, and θ vary across groups. The data in the Census files allow us to do this.

Communication:

Groups differ greatly in their fluency rates. Table 1 reports fluency and education levels among immigrants by region of ancestry. Not surprisingly, immigrants from the British Empire have the highest rate of English fluency. Latin Americans, who comprise the largest group of immigrants,

have the lowest fluency rate.

Table 1

Fluency and Education Among Immigrants By Region of Ancestry

Country	Variable	Number of Obs.	Mean
Australia, New Zealand, Canada	fluent	2770	.98
	educ	2770	11.7
Asia	fluent	35338	.76
	educ	35338	11.5
Eastern Europe	fluent	11490	.86
	educ	11490	11.7
Latin America	fluent	66757	.56
	educ	66757	8.7
Middle East	fluent	5495	.85
	educ	5495	12.2
Northern Africa	fluent	574	.94
	educ	574	14.1
Not Specified	fluent	14653	.76
	educ	14653	9.8
Other European	fluent	124	.96
	educ	124	13.2
Pacific Islander	fluent	416	.89
	educ	416	10.9
Sub-Saharan Africa	fluent	1566	.94
	educ	1566	12.9
Southern Asia	fluent	4762	.91
	educ	4762	13.5

Country (Continued)	Variable	Number of Obs.	Mean
Western Europe	fluent	44031	.94
	educ	44031	11.6
West Indies	fluent	5799	.94
	educ	5799	11.3
US Ancestry (Not born in US)	fluent	641	.98
	educ	641	10.5
African American (Not born in US)	fluent	1415	.98
	educ	1415	10.7
Native American (Not born in US)	fluent	1854	.92
		1854	12.4

More evidence can be presented on variations in G* by group. Table 2 reports the coefficients on country dummies from a logit that has as its dependent variable "FLUENT," a dummy equal to 1 if the respondent reported that he or she spoke English very well or well. The logit is run on the sample of individuals living in the US in 1990 who were born outside and are 5 years of age or older. Excluded are individuals whose native or only language is English. Thus, Canadians, Australians and the British are out of the sample. (Of course, by the G_B* criterion, Canadians are ideal immigrants. They may fall short by the disjointness criterion.) This leaves 147,756 observations.

The right hand variables include age, years in the US, and place of birth dummies for the countries listed in table 2. These countries are the largest suppliers of immigrants and they are listed in rank order in table 2.

First note that 14/18 coefficients are negative. Because the sample size is so large, all

coefficients are estimated with great precision. Statistical significance is not an issue. Relative to the base group, which in this case are those who immigrated from a country not listed in table 2, these immigrants are less likely to become fluent in English. This is another manifestation of the point made in Lazear (1997). Since these immigrants are from the largest groups, they are the immigrants most likely to encounter individuals with their own backgrounds and therefore the least likely to learn English.

More important for the purpose here is that there is wide variation across groups. Germans have a predicted fluency probability of .92 whereas a Mexican with the same characteristics has a predicted fluency probability of .37.

Table 2

Overall Fluency Rate = .68

Country	Coeff. in logit	Change in Probability
Mexico	-2.287329	-0.497723
Non-Mexico Spanish Speaking	-1.412393	-0.307337
China	-1.201402	-0.261425
Philippines	1.385355	0.3014532
Vietnam	-0.975913	-0.212359
Italy	-0.940631	-0.204681
Korea	-0.858997	-0.186918
India	0.8852494	0.1926303
Germany	1.124213	0.2446287
Poland	-0.508278	-0.110601
Russia	-0.631468	-0.137408
Taiwan	-0.183816	-0.039998
Japan	-0.787013	-0.171254
Haiti	-0.428511	-0.093244
Iran	0.4914111	0.1069311
Portugal	-1.424866	-0.310051
Greece	-0.815842	-0.177527
Laos	-1.54405	-0.335985
Other coefficients		
Age	-0.064	-0.014
Years in the US	0.104	0.022
Number of Observations = 147,756 Log Likelihood = -72679		

Older immigrants are less likely to be fluent, consistent with standard human capital predictions. Also, the probability increases by about 2 percentage points for every additional year that an immigrant is in the United States.

Overlap:

The diversity argument relies on the assumption that immigrants have different cultural experiences than native born Americans and thereby bring new information to the table. But immigrants are not all the same. Some have backgrounds that are much more similar to Americans; others are quite different. Although this is difficult to quantify, it is possible to shed some light on the issue by analyzing the ancestry of the American population. These proportions can then be compared to our current flow of immigrants.

Table 3 reports the ancestry of a 1/1000 sample of native born Americans in the 1990 Census.

Table 3

Ancestry among native born Americans in 1990

	Number	Freq. in US pop.	Freq. Immig.
By Region			
African American	18382	0.089	0.007
Asia	1509	0.007	0.178
Australia, New Zealand, Can.	2262	0.011	0.014
Eastern Europe	12016	0.058	0.058
Latin America	9854	0.047	0.338
Northern Africa	24	0.000	0.003
Native American	6262	0.030	0.009
Middle East	562	0.003	0.028
Not Specified	22733	0.109	0.074
Other European	381	0.002	0.001
Pacific Islands	285	0.001	0.002
Sub-Saharan Africa	171	0.001	0.008
Southern Asia	106	0.001	0.024
Stated US Ancestry	12398	0.060	0.003
Western Europe	120511	0.580	0.223
West Indies	212	0.001	0.029
Total	207668	1.000	1.000
Selected Countries			
China	315	0.002	0.046
Cuba	204	0.001	0.027
Mexico	5946	0.029	0.197
Philippines	356	0.002	0.041
Vietnam	61	0.000	0.021
other	200786	0.967	0.668
TOTAL	207668	1.000	1.000

The obvious finding from table 3 is that about 60% of native born Americans have Western European ancestry. Excluding those who did not specify or who listed U.S. ancestry, the second largest group consists of African Americans. The third largest group comes from Eastern Europe, followed by Latin American ancestry.

The fourth column of table 3 reports place of birth among the stock of immigrants in 1990. Latin Americans are the largest group, followed by Western Europeans and then by Asians (from East and Southeast Asia). Asian ancestry accounts for less than 1% of the native born population, whereas Latin American ancestry accounts for about 5% of the native born Americans. Western Europeans account for 60% of the American population. Adding immigrants to the native born drives the Latin American proportion up to around 8% and the Asian proportion up to around 3%.

The diversity argument suggests that our current immigration policy does not minimize overlap. By the disjointness criterion, the U.S. admits too many Western Europeans and possibly too many Latin Americans. Asians seem to be the only large group of immigrants that are not already a large part of the American base.

Taken literally, diversity implies that we are accepting the wrong people. For example, under-represented are Northern Africans immigrants. They are the smallest group in the current American population and there are a significant number of potential immigrants, especially in Egypt, Morocco and Algeria from which to draw. Indeed, the diversity argument points to a very different immigration policy than the one that is currently in place. Rather than selecting immigrants based on the existence of relatives in the United States, diversity would be served better by doing the opposite. Countries whose residents have the most relatives in the United States are the ones least likely to bring in cultural diversity.

Relevance:

The empirical analogue of relevance is somewhat difficult to define. One possibility is that relevance may be related to education. Highly educated immigrants, or at least those with education levels equivalent to those of native borns, are more likely to have relevant information than those with much less education. It is unlikely that the details about a particular form of agriculture no longer practiced in the U.S. are as relevant as information on a new agriculture technique that has been used elsewhere, but not yet in the United States.

It is useful, therefore, to return to table 1 and to examine education level by region of origin. It is true, of course, that a years of schooling have country-specific meaning. Variations in educational quality and subject matter is likely to be significant across countries. Still, the averages may be instructive.

Somewhat surprisingly, Northern Africans top the list on average education level. This is almost certainly a result of selective admission. Few and only highly educated North Africans have been successful at obtaining permission to come the U.S. Country-specific evidence is presented in Table 4, which reports educational attainment (for those no longer in school) by country of origin for large suppliers of immigrants.

Table 4

Mean Levels of Education by Place of Birth

Variable	Obs	Mean	Std. Dev
Overall	151888	10.74358	4.76573
Mexico	32618	7.394307	4.451661
Non-Mex.	23599	10.30878	4.50487
China	3967	10.72044	5.733337
Phillipn.	7104	13.17553	3.786291
Vietnam	3167	10.40101	4.759378
Italy	5618	9.260413	4.343628
Korea	3181	12.4967	4.195993
India	3103	14.83323	4.3834
Germany	6514	12.33067	3.18601
Poland	3129	11.10674	4.370777
Russia	2405	11.58004	4.787556
Taiwan	1500	14.77033	3.997592
Japan	2541	13.33806	3.198493
Haiti	1181	10.46359	4.555955
Iran	1283	13.86945	4.206208
Portugal	1549	8.157198	4.717947
Greece	1575	10.40063	4.338387
Laos	837	6.424134	5.707947

Immigrants from Mexico have the lowest level of education and those from India and Taiwan have the highest. Indeed, the highly educated immigrant groups have levels of education that are substantially above the average level among native born Americans. In 1990, native born

Americans who were not currently enrolled in school and were older than six years old had average levels of education equal to 12.27 years with a standard deviation of 3.08 years.

Again, the differences in education between source countries is as likely to reflect immigration policy as it is to reflect inherent differences in educational systems or levels. This may be an important point by itself. The characteristics of immigrants in the US are as likely to reflect the effects of selective immigration policy as they are to reflect the characteristics of the underlying populations from which the individuals are drawn. A policy that is more lenient toward country C than B will end up with a less qualified pool of immigrants from C than from B, sometimes even when the qualifications of Cs are generally higher than those of Bs.

The importance of immigration policy in filtering out different groups of immigrants can be seen quite clearly by comparing immigrants from Northern Africa, whose average education level is 14.1 years with those from Japan, whose average education level is 13.3 years. The difference observed in the U.S. between these groups reverses the patterns observed in the native populations and reflects the extreme difficulty of gaining admission to the U.S. from Northern Africa.

Clustering

As mentioned above, the probability of encountering like or unlike individuals is endogenous. In a country that is already as diverse as the United States, it is possible, through geographic mobility, to affect the population with whom trade occurs. Individuals cluster with others of their own type. This is most easily seen by comparing CNTYPCT to the proportion of immigrants in the U.S. This variable, discussed in Lazear (1997), measures the proportion of a counties population that is made up of persons who were born in the particular individual's native

country.

If immigrants were spread randomly throughout the US, then the proportion of one's own countrymen encountered would be unrelated to place of residence. Every county would be a microcosm of the U.S. For example, 1.7% of the people living in the U.S. in 1990 were born in Mexico. Were they spread randomly throughout the U.S., then the average CNTYPCT observed for Mexicans living in the U.S. would be .017.

Conversely, if Mexican born immigrants were completely segregated, most counties would have no Mexicans and a few counties would be 100% Mexican born. Since CNTYPCT is defined for a specific individual, every Mexican born immigrant would have a value of CNTYPCT equal to one. That is, every Mexican born immigrant would reside in a county that consisted entirely of persons born in Mexico.

In fact, the mean value of CNTYPCT among Mexican born immigrants is .146, much larger than the .017 value that would prevail were Mexican borns sprinkled randomly throughout the U.S. Thus, Mexican immigrants tend to live in more immigrant intensive communities than do native borns. The same is true is true for other large immigrant groups.

The effect of clustering can be examined in another way. A logit identical to that in table 2 was run, except that CNTYPCT included. The coefficient is negative and large. Non-fluent immigrants move to counties with high proportions of individuals from their own countries and they are less likely to learn English. The decision on where to locate is endogenous, and the country coefficients are pushed toward zero when CNTYPCT is included. Taking into account the residential decision reduces the differences between groups because the least fluent groups are most likely to locate in highly segregated communities. But immigrant groups that segregate pass on

fewer of the gains from diversity to the native population.

Diversity Reconsidered:

When fluency rates are .55, it is virtually impossible to make a case for diversity. But as the fluency rate rises, the diversity argument makes more sense. Let us consider North African immigrants, whose fluency rate is at .92. Substitution into (20) implies that diversity is favored when

$$\theta(B_1 - A_0) > 1.087.$$

Now, suppose that 75% of what North Africans know overlaps completely with the native born American population. Suppose further that the amount of knowledge possessed by native borns and by North Africans is the same. Finally, suppose that half of the disjoint information is relevant to native born Americans. Then, $B_1 = 1.25$, $A_0 = 0$, and

$$\theta = 1\ (1/1.25) + .5\ (.25 / 1.25) = .9$$

so that

$$\theta(B_1 - A_0) = 1.125,$$

which exceeds the required 1.087. If these assumptions are valid, then diversity, brought about through immigration of Northern Africans, would be welfare improving to the native population.

The lesson here is that communication between native borns and immigrants is the crucial parameter. Unless communication is high, it is virtually impossible to argue in favor of an immigrant group on the basis of gains from diversity. As a practical matter, this means English fluency. Since very few of the native born American population can be fluent in a large number of other languages, it is necessary that all residents speak a common language.

Of course, it is possible for trade to occur without direct communication. Translators can be used and points of contact between different types of individuals can be minimized. But doing this negates the diversity argument almost by default. An impersonal market, coupled with a few translators works well to ensure that French wine adorns the tables of American restaurants. But the French vintners need not be U.S. residents for this to occur. The gains from having French vintners teach Californians how to make wine are reaped only when direct communication between the two groups occurs.

Additionally, education and fluency are related. Immigrants, not currently in school, who report that they are fluent in English have average levels of education equal to 11.8 years, whereas those who are not fluent in English have an average education level equal to 7.3 years. Thus, relevance, defined by education level, and communication are likely to be positively related.

Finally, subsequent generations have been ignored. Since virtually all of the children of immigrants are fluent in English, the concerns that were raised in previous sections about English fluency are lessened. On the other hand, children of immigrants who grow up in the U.S. are less likely to have knowledge and skills that differ from (other) third and subsequent generation Americans. Thus, communication is enhanced when consider children of immigration, but disjointness declines.

Balanced Immigration:

The empirical evidence suggest that diversity is enhanced by balanced immigration. Even if one accepts the diversity argument, diversity is useful only when English fluency among

immigrants is high. Theory (see Lazear (1997)) and evidence suggest that individuals who come from countries that make up a small part of the U.S. population are most likely to learn English.

Further, balanced immigration, especially from groups that are not already well represented in the U.S. population, provides the greatest amount of disjointness. If we take the diversity argument seriously, it implies that welfare is enhanced when immigrants come from a large number of underrepresented countries. This suggests that the current policy, which favors relatives of current residents hinders rather than helps diversity.

Since education is a characteristic that can be screened and selected, there is no obvious reason why countries should be favored or penalized on the basis of the average level of education among their immigrants to the U.S. Even though immigrants from Mexico have the lowest average level of educational attainment, nothing prevents the U.S. from having a policy that favors highly educated Mexican immigrants, if educated immigrants are desired.

Indeed, the lesson learned from this analysis is that current immigration policy is off-target if the diversity argument is accepted. Current policy that favors immigrants who have relatives in the U.S. may have other virtues, but it is likely to grant resident status to those who have significant overlap with the current population, who have low rates of English fluency, and who suffer on the relevance criterion as well.

Conclusion

A diversity argument can be made for immigration. The desire for diversity is expressed in terms of gains that can be realized by interacting with individuals who have different backgrounds. Taken literally, the case for diversity is strongest when individuals who differ from

the majority confer larger gains from trade on majority members than do majority members receive from interacting with their own kind. This argument implies that desirable immigrants come from cultures that are disjoint from current American culture and from cultures that are relevant to Americans. Most important, it is necessary that individuals can communicate with one another. As a practical matter, communication requires a high rate of English fluency among immigrants.

Current immigration policy favors the relatives of U.S. residents. In part, as a result of clustering, this policy has resulted in low fluency rates, which reduces the welfare gains from immigration. Also, because more educated immigrants are likely to do better on the relevance criterion and because education and English fluency are linked, diversity gains are likely to be positively related to the education levels of the immigrant stock. Related, the results suggest that our immigration policy has resulted in differences in the characteristics of immigrants that reflect the effects of selection as much as they do the underlying characteristics of the populations from which the immigrants are drawn.

The current policy does not lead to an immigrant flow that enhances diversity. Instead, certain countries and cultures are favored at the expense of other countries and cultures. Furthermore, the countries that are the largest suppliers of immigrants are not among the best by the criteria of disjointness, relevance, or communication. A policy that sold immigration slots or one that ranked the specific characteristics of the individual immigrants would be more likely to enhance diversity.

References

Borjas, George. "The Economics of Immigration," *Journal of Economic Literature*, XXXII,4 (December, 1994), pp. 1667-1717.

Card, David. "The Impact of the Mariel Boatlift on the Miami Labor Market," *Industrial and Labor Relations Review,* 43,2 (January, 1990), pp. 245-57.

Hong, Lu and Scott E. Page "Problem Solving by Heterogeneous Agents," unpub. manuscript, Syracuse University, June, 1997.

LaLonde, Robert and Robert Topel. "Labor Market Adjustments to Increased Immigration," in John Abowd and Richard Freeman (eds.) *Immigration, Trade and The Labor Market.* Chicago: U. of Chicago Press, 1991.

Lazear, Edward P. "Culture and Language," draft, Stanford University, December, 1997, also forthcoming in "Essays in Honor of Gary S. Becker," *Journal of Political Economy.*

Lazear, Edward P. *Personnel Economics for Managers.* New York: John Wiley & Sons, 1998.

O'Reilly, Charles, Katherine Williams, and Sigal Barsade. "Group Demography and Innovation: Does Diversity Help? in E. Mannix and M. Neale (eds.) *Research on Groups and Teams*, Vol. 1. Greenwich, Ct: JAI Press, 1998.

Weitzman, Martin "On Diversity," *Quarterly Journal of Economics,* 107,2 (May, 1992), 363-405.