

Chiswick, Barry R.; Miller, Paul W.

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Immigrant Earnings: Language Skills, Linguistic Concentrations and the Business Cycle

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**Immigrant Earnings: Language Skills, Linguistic Concentrations
and the Business Cycle**

by

Barry R. Chiswick
University of Illinois at Chicago
and
University of Chicago

and

Paul W. Miller
University of Western Australia

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June 1999

Abstract

**“Immigrant Earnings: Language Skills, Linguistic Concentrations
and the Business Cycle”**

**Barry R. Chiswick
and
Paul W. Miller**

This study of the determinants of earnings among adult foreign-born men using the 1990 Census of Population focuses on the effects of the respondent's own English language skills, the effects of living in a linguistic concentration area, and the effects of the stage of the business cycle at entry into the U.S. labor market.

The analysis demonstrates the importance of English language fluency among the foreign born from non-English speaking countries. Those who are fluent earn about 14 percent more than those who lack fluency, which is similar to the earnings differential in the 1980 Census. There is strong evidence for the complementarity between language skills and other forms of human capital. The partial effects on earnings of schooling, on-the-job-training, duration in the U.S., weeks worked and being married are greater for those who are more fluent in English.

There is strong evidence using selectivity correction techniques for the endogeneity between language and earnings. Language skills are acquired in response to economic incentives.

Earnings are lower in an area with a higher minority language concentration, especially among those with greater English language fluency. That is, living in an area in which many others speak the same non-English language as the immigrant has a depressing effect on earnings. This appears to be due to an “ethnic goods” effect, rather than due to labor market crowding.

Earnings are lower among those who enter the U.S. labor market in a period of high unemployment. This adverse effect, however, is temporary as it disappears with duration of residence. This suggests the initial disadvantage is not a permanent “scar” and is not due to immigrants in a recession being of lower quality. Rather it suggests that the disadvantages from entering the labor market during periods of high unemployment are dissipated over time.

“Immigrant Earnings: Language Skills, Linguistic Concentrations and the Business Cycle”

I. Introduction

This paper is concerned with the analysis of the earnings of immigrants. In particular, it focuses on several inter-related and unresolved issues using data from the 1990 Census of Population of the United States.

One set of issues relates to the individual’s own language skills. To what extent are the earnings of immigrants in the United States influenced by the respondent’s proficiency in English?¹ Has there been a change over time? Are different forms of human capital complementary to language capital (language proficiency)? That is, is language capital more productive in the labor market among those with more schooling and other forms of human capital? Moreover, does it appear that investments in language capital are greater among those who expect to receive a greater economic return from English-language proficiency? That is, is language proficiency endogenous to the labor market?

A second and inter-related set of issues has to do with the linguistic characteristics of the area in which the respondent lives. Among those who speak a language other than English, does it matter whether they live in an area in which many others speak their origin language (to be referred to as linguistic concentration), as distinct from an area in which few speak this language? While linguistic concentrations have been shown to lower language proficiency (see Chiswick and Miller 1992, 1995, 1998), are they also associated with lower earnings, other things being the same? Controlling for the individual’s own characteristics, the cost of “ethnic goods,” broadly defined to include social networks, would be lower the greater the extent to which others speak the same origin language. Then, larger linguistic concentrations would be associated with lower reservation wages, and hence lower observed earnings.

¹One of the earliest studies to consider this issue is McManus, *et al.* (1981).

Finally, one of the issues discussed in the literature is whether the stage of the business cycle at entry into the labor market affects the earnings of immigrants. It has been shown by Nakamura and Nakamura (1992) and Stewart and Hyclak (1984) that immigrant earnings are lower among those who enter in a period of high unemployment. Unresolved, however, is whether this is a permanent effect, perhaps due to a lower “quality” immigrant cohort in a recession, or whether this is a temporary disadvantage due to the difficulties of finding a high wage job or a good job match during a recession.

Section II presents the model of the earnings of immigrants in the labor market. Particular attention is given to the variables that are of primary focus in this study, namely, the individual’s own English language proficiency, the linguistic concentration of the area, and the stage of the business cycle at entry into the labor market. This permits a separation of the effects of the immigrant’s own language skills from linguistic concentration effects.

Section III describes the data from the 1990 Census of Population of the United States used for this study, as well as the estimating equations. The empirical estimation is presented in Section IV. Various specifications of the variable for the respondent’s English language fluency are considered, as are the concentration and business cycle effects, among others. A summary and conclusion, with implications for both immigration policy and assimilation (post-migration) policy closes the paper (Section V).

II. MODELLING EARNINGS IN THE IMMIGRANT LABOR MARKET

The study of earnings in the immigrant labor market has in large part been based on the human capital earnings function (Mincer 1974), which includes schooling and labor market experience, expanded to incorporate the immigrant experience (Chiswick 1978). This equation suggests that variations in earnings across individuals (Y_i) can be explained by variations in the amount of schooling (S_i) individuals have acquired and their labor market experience, in total (T_i) and in the destination (YSM_i). Thus:

$$(1) \quad \ln Y_i = b_0 + b_1 S_i + b_2 T_i + b_3 T_i^2 + b_4 (YSM_i) + b_5 (YSM_i)^2 + e_i,$$

where $\ln Y_i$ is the natural logarithm of the earnings of individual i , schooling (S_i) is a measure of the years of full-time equivalent schooling of the individual, experience (T_i) is the potential length of time the individual has spent in the labor market (in the origin and in the destination), and years since migration (YSM_i) is the number of years in the destination. The experience variables reflect the acquisition of skills through formal and informal training on the job, including merely living in the destination. A quadratic specification is employed as economic theory and prior empirical research have both shown that earnings tend to increase at a decreasing rate with years in the labor market and in the destination (see, for example, Ben-Porath 1967, Chiswick 1978). The stochastic error term (e_i) captures the influences of unobserved or unmeasured variables (e.g., motivation, effort, luck) on earnings.

The relationship between earnings and duration of residence is generally held to reflect learning about the institutions of the U.S. labor market, cultural adjustment factors, the development of networks for labor market contacts, and investments in U.S.-specific human capital skills that lead to labor market success (see Chiswick 1978). These effects (investments) are expected to be greatest in the first few years and to diminish with duration in the destination.

Acquisition of skills in the dominant language can be viewed as a form of human capital accumulation. Studies of immigrant language skills in the labor market have tended to treat language skills in the same way as schooling and post-school training.² Thus, the basic human capital earnings equation can be extended to:

$$(2) \quad \ln Y_i = b_0 + b_1 S_i + b_2 T_i + b_3 T_i^2 + b_4 (YSM_i) + b_5 (YSM_i)^2 + b_6 LANG_i + v_i,$$

where $LANG_i$ is a measure of the destination language fluency of the individual and v_i is the stochastic error term.

Prior empirical analysis has confirmed that language fluency has an important effect on earnings. Chiswick and Miller (1992), for example, report that among adult foreign-born men in

²See, for example, McManus, *et al.* (1981), Tainer (1988), Chiswick (1991), Chiswick and Miller (1992, 1995, 1998).

the U.S. 1980 Census of Population, English language fluency is associated with around 17 percent higher earnings. The earnings advantage associated with fluency in the dominant language in the 1981 Canadian Census is about 12 percent, while those fluent in English in the Australian 1986 Census have about 8 percent higher earnings (Chiswick and Miller 1995).³ Fluency in the dominant language (Hebrew) in Israel (1972 and 1983 Censuses) is associated with about a 12 percent increase in earnings (Chiswick 1998 and Chiswick and Repetto, 1999).

In competitive labor markets, the mobility of workers from low-wage areas to high-wage areas is expected to erode any regional differences in real earnings (up to a cost-of-moving wedge). If there are factors, however, that impede the mobility of individuals across regions, then real earnings variation by region of residence could be observed even beyond short-term disequilibria differentials. In the case of the foreign born, the propensity to cluster in communities formed on the basis of language and ethnicity may be important in influencing inter-regional mobility by affecting the “full cost of living” across areas.⁴ These costs would be lower in areas where there are others who speak the same language and observe the same customs.

Consider a situation in which an ethnic group defined by language or some other characteristic has a market basket for goods and services that differs from other groups. These “ethnic goods” could include conventional foods and services, such as ethnic foods and ethnic-specific clothing or household items. More important may be less tangible items such as origin language media (e.g., newspapers, books, radio, television), houses of worship, social clubs, other individuals of the same background to share memories and holidays, and opportunities to interact with others of the same origin in the marriage market. The full price of “ethnic goods” would be lower the larger the size of the ethnic market because of economies of scale and lower

³This is greater than the 5.3 percent higher earnings for the fluent in the 1981 Australian Census (Chiswick and Miller 1995).

⁴For analyses of the internal migration of immigrants see, for example, Bartel and Koch (1991).

networking costs. Then, in a competitive labor market in which internal migration equalizes regional differences in wages, group differences in linguistic and/or ethnic concentrations result in group-specific patterns of regional wage differentials. In other words, if ethnic goods are important, a high wage offer is needed to induce a member of the group to leave an area of concentration (low cost of ethnic goods) to live in an area with few others of the same origin (high cost of ethnic goods). Then, the size of the linguistic concentration is inversely related to observed earnings.

A minority language concentration measure, first introduced in Chiswick and Miller (1992), is used to measure the linguistic concentration. Concentrations of foreign language speakers may have a direct effect on the earnings of individuals through the “ethnic goods” effect. Linguistic concentration may also have an indirect influence on earnings through their negative impact on the acquisition of destination language skills (Chiswick and Miller 1992, 1995, 1998). By including variables for both linguistic concentration and the individual’s own language skills in an estimating equation, the relative strengths of these direct and indirect effects may be assessed.

There may also be important interaction effects due to the limitations on internal mobility. Individuals who are not fluent in English, and who live in linguistic concentrations may have higher earnings than their counterparts who, perhaps for family reasons (tied stayers) live in predominately monolingual English-speaking regions. The former may have economic advantages from working in a linguistic minority enclave.

Variables for country of birth are included in the earnings equation for the foreign born to capture the unmeasured differences in the average productivity of immigrants from the various countries of origin, that is, differences in quality not measured in the other variables. Differences in average quality might be expected where the international transferability of skills varies across immigrant groups (for example, immigrants from English-speaking and non-English speaking countries), or where some immigrants are less favorably selected for migration (for example, refugees compared to economic migrants) and so have fewer skills relevant for the destination, *ceteris paribus*. Country of origin differences can also arise if the backgrounds of immigrant

groups differ. For example, immigrants from Mexico are disproportionately from rural communities. The skills accumulated in the labor markets of the rural communities of developing economies may be less useful in the U.S. labor market than the pre-immigration skills of immigrant groups that are predominately from urban areas and developed countries. Moreover, expected rates of re-migration differ across origins (Ahmed and Robinson, 1994), and therefore the propensity to invest in destination-specific skills would decrease with a higher expected emigration propensity. Finally, the birthplace variables will also capture differences in the effects of culture and discrimination on measured earnings.

Citizenship has been shown to affect earnings (Chiswick and Miller 1992). Naturalization generally requires the demonstration of at least a minimum level of English language fluency. It also reflects a stronger commitment to the United States which would be associated with greater investment in U.S.-specific human capital, and thus higher earnings. Moreover, aliens are disadvantaged in the labor market as some jobs require citizenship status, or because of illegal discrimination against lawful resident aliens.

To measure the effect of the business cycle at entry on immigrant earnings, the analysis includes the adult male unemployment rate in the United States in the year of arrival or of entry into the U.S. labor market, whichever is later. This variable permits an examination of whether labor market entrance at a time of high unemployment has a negative effect on an immigrant's future labor market success.⁵

⁵Nakamura and Nakamura (1992) report that a higher national unemployment rate in the year of entry into the labor market is associated with a lower current wage among the foreign born in both the U.S. (1980 Census) and Canadian (1981 Census) labor markets. Stewart and Hyclak (1984) find that a higher annual growth rate in real GNP in the period of entry is associated with higher earnings among the foreign born in the 1970 U.S. Census. These studies did not test for whether the "scarring effect" varies by duration of residence in the destination. Chiswick, Cohen and Zach (1996), however, find that, using the Current Population Survey, the labor market conditions at the time of entry have an adverse effect on employment shortly after arrival, but do not have an effect on the future employability (employment ratio or unemployment rate) of immigrants in the United States.

Interacting the unemployment rate at labor market entry with the duration in the United States will indicate whether the disadvantage due to the state of the labor market at the time of labor market entrance diminishes with duration in the destination. This will provide insights into the origins of this particular wage effect. For example, if the wage disadvantage dissipates with duration, the effect is a “temporary blemish” rather than a “permanent scar”. The temporary blemish may occur if arrival in a period of high employment makes it more difficult for the immigrant to obtain any employment or to obtain employment that makes maximum use of the immigrant’s transferable skills. The adverse effects of a poor initial placement would be expected to diminish with duration in the destination.

If the wage effect persists, however, attention needs to be focused on permanent factors for the explanation: either the initial placement in a recession results in a permanent disadvantage or it is more likely to be the result of negative selection for immigration during recessions. Negative selection for migration during recessions might occur if factors other than economic advantage are relatively more important in the migration decision when job opportunities in the destination are scarce. In such circumstances, family reunification and refugee motivations may be relatively more prevalent in migration flows than purely economic migrations.

III. THE DATA AND ESTIMATING EQUATIONS

The data are from the 1990 Census of Population, Public Use Microdata Sample, and are for the 5 percent sample of the foreign-born men from non-English speaking countries.⁶ The variables are defined in detail and the means and standard deviations are reported in Appendix A.

The estimating equation used in the empirical analysis relates the natural logarithm of annual (1989) earnings for adult (age 25 to 64) men to a set of explanatory variables. These variables (with their hypothesized partial effects in parentheses) include: years of education (+), total years

⁶Immigrants from English-speaking countries are excluded as the language issues for this group are different from those for immigrants from non-English speaking countries.

of labor market experience (+), duration of residence of immigrants in the U.S. (+), English language fluency (+), U.S. citizenship (+), married (+), weeks worked (+), the adult male unemployment rate at the time of arrival or entry in the U.S. labor market (-), the interaction of this unemployment rate variable and duration of residence (+), the minority language concentration measure (-), and the interaction between the minority language concentration measure and the individual's own English language fluency (-). Country of origin dichotomous variables are also included, with Western Europe as the benchmark. Three additional dichotomous variables are unity for those living in a rural area, (-), those living in a southern state, (-), and those whose race is Black (-).

Separate analyses of earnings are conducted for those fluent in English and for those who lack English-language fluency, using both OLS and selectivity correction techniques. In addition, the data are disaggregated by major birthplace groups, and earnings equations are estimated for each subsample.

IV. THE EARNINGS OF IMMIGRANTS

The empirical analysis begins with the estimations for the foreign born adult men (Tables 1 and 2). Table 1 reports estimates obtained when the data are pooled across individuals fluent in English and those who lack this skill. The estimates presented in Table 2 are for the separate samples of individuals fluent in English (speaks only English at home or speaks English “very well” or “well”) and individuals with English-language deficiencies, that is, they speak English “not well” or “not at all.”

The separation of the data by English language fluency is not random. Regression equations using non-random samples will result in biased and inconsistent estimates. This problem may be accommodated by employing the methodology advanced by Heckman (1979) that treats the sample selectivity bias as an omitted variables problem. Hence, the equations in columns (ii) and (iv) of Table 2 include the coefficient on the sample selectivity (λ) variable that has been constructed according to Lee (1983). In forming this variable, a reduced form model of

fluency in English is estimated that has a large number of explanatory variables, including educational attainment, age, duration of residence, marital status, location, minority language concentration, veteran status, linguistic distance between English and the immigrant's mother tongue, and the geographical distance between the major city in the immigrant's country of origin and the nearest major port of entry into the United States (Chiswick and Miller 1998). The latter three variables are used as the identifying instruments in the selection (English fluency) equation.⁷

A number of specifications of the earnings equation are reported in Table 1. The first specification is a standard immigrant earnings function without the variables for English-language skills, the second includes a variable for minority language concentration, the third model adds a variable for the individual's fluency in English, the fourth considers the interaction between English language fluency and the minority language concentration measure, and the fifth augments the estimating equation with information on the unemployment rate in the year of entry into the U.S. labor market. The final model in Table 1 explores the effects on earnings of a more detailed measure of English language fluency.

The relationships between earnings and the conventional determinants of earnings will be explored first, and comparisons made between the estimated impacts among individuals who are fluent and those who are not fluent. Then the variables that are of particular interest for this study are discussed.

Additional years of education are associated with around five percent higher earnings when the focus of analysis is the total foreign-born sample (column (i) of Table 1). This impact is similar to that recorded in analyses of the 1980 Census (see Chiswick and Miller 1992). When the earnings equation is estimated separately for individuals fluent in English and for those

⁷Estimates of the logit equation used in the computation of the sample selectivity correction terms are presented in Appendix B. See Chiswick and Miller (1998) for the model of the determinants of English language proficiency that serves as the basis for the selection equation.

lacking this fluency (Table 2, columns ii and iv), the coefficient of schooling is 6.6 percent among the fluent, but only 1.0 percent for those who are not fluent in English.

These findings suggest there is a considerable degree of complementarity in the labor market between English-language skills and formal education. In other words, in the United States it is difficult to reap a return to human capital acquired through formal education unless one can speak English. Acquiring English language fluency therefore appears to be a means of increasing the international transferability of previously acquired forms of human capital. This provides a greater economic incentive for the better educated to become fluent in English than their less educated counterparts. The economic incentive also helps explain the very low mean educational attainment among those who are not fluent in English, only 7.9 years of schooling compared to 13.1 years among immigrants fluent in English.

The relative importance of U.S.-specific skills shows up clearly in the analysis of the effect of labor market experience on earnings. The two sets of relevant variables are years of labor market experience and years since migration. The experience variable reflects the impact of labor market experience accumulated prior to migration, while the years since migration variable reflects the premium to labor market experience accumulated after arrival in the United States. For the total foreign-born sample, earnings increase at a decreasing rate with years of pre-immigration experience. When evaluated at 10 years of experience, the earnings growth per year of experience is 1.6 percent (Table 1, Column i). The earnings growth with additional years of pre-immigration experience is greater among immigrants who are fluent in English than for those that lack English-language fluency (see Table 2).⁸

The earnings premium for a longer duration of residence in the United States is 2.0 percent per year when evaluated at 10 years of residence for the foreign-born men (Table 1, Column i). The separate analyses for the two English-language fluency groups reveal a higher premium to

⁸Using the equations with the selectivity corrections (Table 2, columns ii and iv), the partial effect of pre-immigration experience at 10 years is 1.7 percent for those who are fluent in English and 1.1 percent for those who are not fluent.

U.S. labor market experience (holding total experience constant) for the group not fluent in English when the estimation is by Ordinary Least Squares (OLS), but the expected lower premium for them when the estimation is by the selectivity correction method.⁹ As duration of residence lengthens, additional immigrants move from the "not fluent" to the "fluent" states, and this linguistic mobility affects the estimates of the returns to duration in the destination.

A clear pattern is evident from the comparison of the OLS and selectivity-corrected earnings regressions (Table 2). If a variable is associated with high levels of English fluency (*e.g.*, educational attainment and years since migration) then the selectivity-corrected estimate of the wage differential is greater than the OLS estimate for the group that is fluent in English, and this pattern is reversed for the group that is not fluent in English. However, if a variable is associated with low levels of English language fluency (*e.g.*, minority language concentration) then the selectivity-corrected estimate of the wage difference is lower than the OLS estimate for the group that is fluent in English, with this pattern being reversed for the group that is not fluent in English.

The estimates also show that married (spouse present) men earn around 20 percent more than their non-married counterparts.¹⁰ The favorable effect of being married on male earnings is greater among those who are fluent in English (23 percent) than for the group lacking in English language fluency (15 percent higher earnings). Citizens have higher earnings than non-citizens (9 percent for the total sample), and the effect varies by level of fluency in English, 8 percent for immigrants fluent in English, 3 percent for immigrants not fluent in English.

The elasticity of earnings with respect to weeks worked also varies by English language

⁹Evaluated at 10 years duration it is 1.3 percent per year for the fluent and also 1.1 percent per year for those who are not fluent when the selectivity correction is applied (table 2, columns ii and iv).

¹⁰See Korenman and Neumark (1991) for a discussion of the effect of marriage on earnings among men.

fluency. Overall the elasticity is 0.97, which is statistically significantly different from unity, although the difference has no economic significance. Among the fluent the elasticity is 1.00, but among the non-fluent it is 0.89. That is, a 10 percent increase in weeks worked in the year is associated with a 10 percent increase in annual earnings among those who are fluent, but only a nine percent increase (i.e., weekly earning decline with weeks worked) for the non-fluent group. This difference would be consistent with the latter group having a backward bending supply curve or greater seasonality in their employment.

The effects of the schooling, experience, marriage, citizenship and weeks worked variables suggest that there is a complementarity between these forms of human capital and English language fluency. Those who are fluent receive larger benefits from having more of these favorable characteristics.

Earnings also differ appreciably across birthplace groups, even when account is taken of the individual skills and demographic characteristics. Compared to the benchmark group, immigrants from Western Europe, other immigrants essentially fall into four categories (see Table 1): immigrants from Japan who have earnings about 35 percent greater than the benchmark; immigrants from South Asia whose earnings are not significantly different from the earnings of immigrants from Western Europe; immigrants from countries with earnings 5 to 15 percent below the earnings of the Western Europeans (Sub-Saharan Africa, Southern Europe, Eastern Europe, the non-Spanish regions of Central and South America, Middle East, USSR); those from countries with earnings more than 15 percent below that of the benchmark group (Other Asia, Korea, Cuba, Philippines, the Spanish-speaking regions of Central and South America, China, Indochina, Mexico). The earnings disadvantage, *ceteris paribus*, is over 30

percent for immigrants from Mexico. Note also the tendency for refugee groups (*e.g.*, Cuba, China, Indochina) to have lower earnings even when other measured variables are the same.¹¹

The specification in column (ii) of Table 1 includes the variable for minority language concentration. Residence in a state that contains a larger concentration of individuals speaking the same foreign language as the respondent is associated with lower earnings. Where 10 percent of the population speak the same foreign language as the respondent, compared to an area where none speak this language, earnings are lower by 6 percent. Where 20 percent of the population speak the same foreign language as the respondent (as is the case of Spanish in a number of states), earnings are lower by 12 percent.

The addition of the minority language concentration variable reduces the earnings disadvantage of the three Spanish-speaking birthplace groups: Mexico, Cuba, and the Spanish speaking regions of Central and South America. For immigrants from Mexico, the apparent "birthplace" disadvantage is reduced by 10 percentage points. For immigrants from Cuba and Central and South America, the reduction in the apparent birthplace effect is six percentage points. Part of the Hispanic birthplace effect on earnings, therefore, arises from location in areas where Hispanic immigrants earn lower wages due to the presence of many other Spanish speakers.

The variable for the individual's fluency in English is added to the model presented in Table 1, column (iii). Fluency in English is associated with 14 percent higher earnings, *ceteris paribus*. This increment in earnings is slightly lower than that recorded in study of the 1980 Census (17 percent higher earnings), but the difference is at the margin of statistical significance ($t = 1.75$).

¹¹Chiswick (1997) shows, using data from the 1980 and 1990 U.S. Censuses, that post-World War II immigrants from the Soviet Union, predominately refugees, have very low earnings initially but their earnings rise rapidly with duration of residence.

Hence, whereas there has been a rise in the return to language skills in the Australian labor market over the past few years, this is not the case in the United States (Chiswick and Miller 1995).

Inclusion of the variable for the individual's English-speaking skills is associated with a small reduction in the estimated impact of the minority language concentration variable (from -0.006 to -0.005). Thus, about one-sixth of the effect of living in a concentration of individuals who speak the same non-English second language at home is linked directly to the individual's own lack of English skills. The greater part of the impact is due to other consequences of a labor market characterized by many minority language speakers. Where you work may be an important determinant of earnings.

In terms of its effects on earnings, fluency in English as defined in this study is the equivalent of around three years of formal education and around five years of U.S. labor market experience evaluated at 10 years of experience. Acquisition of English language skills clearly pays in the U.S. labor market. If English speaking fluency can be attained with the equivalent of between 6 months and one-year of full-time training, provided that the working life is reasonably long, this implies a real rate of return to the acquisition of language skills of between 14 and 28 percent. There would appear to be few other investments that an immigrant could undertake that would yield such a healthy monetary return.

The inclusion of a measure of fluency in English in the estimating equation is associated with some (albeit minor) changes in the other estimated coefficients. For example, the extra earnings associated with additional years of education declines by almost one-third of one percentage point, and the income growth associated with years in the U.S. declines marginally. These changes indicate that part of the extra earnings associated with education and duration in the U.S.

in analyses that do not explicitly consider language skills is in fact due to greater ability to communicate in English among the better educated and those who have resided in the U.S. for a longer period of time.

Table 1, column (iv) explores interactions between the minority language concentration measure and fluency in English. It is apparent that residence in a region with a concentration of individuals speaking the same foreign language as the immigrant has a more negative impact on earnings among those fluent in English. The impact of minority language concentration is only -0.002 for those who are not fluent in English, but is -0.006 ($= -0.002 + -0.004$) for those who are fluent in English.

Another perspective on these results is gained by focusing on the effect on earnings of fluency in English. This is estimated to be close to 19 percent for an individual who lives in an area where his origin language is not spoken. Where 20 percent of the population speak the immigrant's origin language, the return to English-speaking skills would only be 11 percent. Thus, while possession of English-speaking fluency is important, the language characteristics of the labor market also appear to matter. The favorable effect on earnings of English language fluency is greater in areas in which fewer people speak the worker's origin language. In other words, the economic penalty from not speaking English is smaller among those who live in a linguistic concentration area.

Table 1, column (v) contains variables that examine the hypothesis that weekly earnings are dependent on the time of entry into the labor market. Weekly earnings are lower when the unemployment rate is high in the year of U.S. labor market entry. In the initial year the effect is nearly 1.8 percent lower weekly earnings for each one point increase in the unemployment rate. For example, if the unemployment rate in the year of labor market entry is 10 percent, then earnings are initially reduced by 9 percent compared to a situation where there was a 5 percent

unemployment rate.¹² The interaction term between the unemployment rate variable and duration in the U.S. shows, however, that over time this disadvantage is gradually removed. Hence, while individuals who entered the labor market in times of 10 percent and 5 percent unemployment rates would initially differ in average earnings by 9 percent, this earnings gap is 6 percent after 10 years and is closed after 30 years of U.S. labor market activity.¹³

The analyses in Table 2 show that the pattern of an initial wage disadvantage from arriving in a year of high unemployment followed by a gradual catch-up pertains only to individuals who are fluent in English. Among those who are not fluent in English, there is no initial earnings disadvantage associated with the stage of the business cycle at entry, nor does the effect of the business cycle vary with the duration of residence. This too suggests that among immigrants who are not fluent in English, there is a form of positive selection for migration during recessions. Perhaps those who are not fluent but who migrate when jobs are scarce have family ties that arrange employment.

The final column of Table 1 contains variables that record in finer detail the English-language skills of immigrants who speak a language other than English at home. The first of these variables indicates the wage differential between immigrants who are monolingual English speakers at home (the benchmark group for this analysis) and immigrants who speak a language other than English at home and report they speak English very well. The latter immigrants are assumed to be fully bilingual, and they are shown to receive a small, statistically significant

¹²This is obtained (Table 1, column v) from $0.018(10-5)=0.09$ or 9 percent.

¹³The partial effect of the unemployment rate on the natural logarithm of earnings (Table 1, column v), is:

$$\partial \ln Y / \partial U = -0.018 + 0.00063(YSM),$$

which diminishes linearly in absolute value as years in the U.S. increases, and reaches zero at about 30 years. Because of the very small variation in the adult male unemployment rate in the post-war period, attempts at estimating a non-linear effect of the unemployment rate interaction with duration were not successful.

wage premium, of about 2 percent ($\hat{\tau} = 2.6$). The second variable identifies individuals who speak a language other than English at home and who self-report that they speak English "well". This group has earnings 9 percent lower than monolingual English speakers. The final two variables are for individuals who speak a language other than English at home and are not fluent in English. Immigrants in this situation have earnings almost 20 percent lower than the benchmark group of monolingual English speakers. Individuals who speak English "not well" earn about the same as those who do not speak English at all, and there may be little difference in the English proficiency of these two groups. These results show that the labor market is quite discerning when it comes to language skills.

The statistical significance of the lambda terms in the selectivity-corrected estimates in Table 2 indicate that the samples separated on the basis of language fluency are not random. Moreover, the sign of the coefficient on lambda is positive for the sample that is fluent in English and negative for the sample that is not fluent in English.¹⁴ As the selection term in the "not fluent" category is constructed to be negative, a negative coefficient indicates an observed conditional mean that exceeds the population mean. That is, a negative coefficient in the "not fluent" group implies positive selection into that group. This indicates that there is positive selection into each state. In other words, the unobserved characteristics that lead to an individual having a higher than expected level of fluency in English are also associated with a higher than expected earnings in the labor market for individuals who are fluent in English. Moreover, those who have higher than expected labor market earnings for individuals who are not fluent in English are more likely to select into this state than other individuals (*i.e.* they have a lower than expected level of English language fluency).

¹⁴The selection variables in the fluent and not fluent samples are defined as f_i/F_i and $-f_i/(1-F_i)$, where f_i and F_i are the standard normal density and standard normal distribution functions, respectively, evaluated at the level of the index of fluency for individual i computed using Lee's (1983) methodology.

This study of the correlation between the residuals in the earnings equations and the model of English-language fluency therefore suggests that English-speaking skills are endogeneously determined in the model of earnings. That is, a worker's language skills are influenced by expectations with respect to income returns.¹⁵

Table 3 presents selected statistics from analyses of earnings for the major birthplace regions. The first column lists the mean logarithm of earnings for each birthplace region. The second column treats immigrants from Western Europe as the reference group and examines the differences between the mean logarithm of earnings for each birthplace region and the reference group. These figures range from a high of 0.132 for Japan (14 percent higher earnings) to a low of -0.922 for Mexico (60 percent lower earnings). Other relatively low earnings origins are Indochina, Central and South America, Sub-Saharan Africa, Cuba, China and Korea. The data in the third column are the birthplace effects, other variables held constant, from column (i) of Table 1. Comparison of the data in columns (ii) and (iii) of Table 3 reveals the extent to which factors such as differences in educational attainments, years of labor market experience, duration in the U.S., and location account for the unadjusted earnings differences measured in the Census data. In many cases the narrowing of the earnings differentials between the unadjusted and adjusted figures is pronounced. For example, in the case of immigrants from Southern Europe, the earnings differential falls by over two-thirds when adjustments are made for the impact of the determinants of earnings other than birthplace. Similarly, for immigrants from Mexico, the earnings differential falls by over two-thirds, while in the case of immigrants from Cuba, it is reduced by one-half.

¹⁵An alternative methodology is to estimate the specification presented in Table 1 using an Instrumental Variables (IV) estimator. The results obtained, however, were not robust with respect to the choice of identifying instruments. In view of this unreliability, the IV results are not presented here. Results using this procedure on 1980 Census data for the U.S. are reported in Chiswick and Miller (1992) and for several countries in Chiswick and Miller (1995).

Table 3, column (iv) lists information on the mean fluency rates for each birthplace region, while column (v) lists the partial effect of fluency on earnings for each birthplace. It is only among immigrants from South Asia, Sub-Saharan Africa and from non-Spanish speaking parts of Central and South America that fluency in English is not associated with significantly higher earnings in the U.S. labor market. These groups have very high levels of fluency (96 percent, 97 percent and 99 percent, respectively); nearly all of the respondents are fluent in English. Among the other birthplace regions, the effect on earnings associated with fluency in English ranges from lows of 7 percent for Southern Europe and the Philippines, to highs of 14 to 16 percent for Western Europe, USSR, Indochina, Other Asia, Middle East, Mexico and the Spanish-speaking regions of Central and South America.

The data were also examined for the returns to “bilingualism.” That is, do those who speak a language other than English at home and who report they speak English “very well” have higher earnings than monolingual English speakers? In only four birthplace groups is there evidence of the labor market rewarding this skill, namely the Philippines (5 percent higher earnings), Mexico (10 percent higher earnings), the Spanish-speaking regions of Central and South America (also 10 percent higher earnings) and the non-Spanish speaking regions of Central and South America (13 percent higher earnings).

The impact of the minority language concentration variable on earnings within country of birth categories is examined in the seventh column of Table 3. This variable has negative and significant impacts on earnings for the three Spanish-speaking birthplace groups, and also for the Philippines. The size of the estimated coefficients for the Spanish-speaking regions are interesting: the smallest partial effect is estimated for immigrants from Mexico and the largest partial effect is estimated for immigrants from the Spanish speaking regions of Central and South America. The coefficient is negative, although not statistically significant, for most of the Asian countries.¹⁶ The coefficient is positive, although not statistically significant, for the European

¹⁶ The variable is associated with higher earnings (at the margin of statistical significance) among the small sample of immigrants from the heterogeneous Other Asia ($t=1.99$). A positive

countries. Thus, there is a clear negative effect for Spanish and Tagalog, with weaker negative effects for most of the other Asian languages. This is consistent with the ethnic goods model as the cultural characteristics of the Hispanic and Asian immigrants differ far more from the American mainstream than that of the European immigrants.

The final two columns of estimates in Table 3 give the mean level of schooling and the estimated partial effect of schooling on earnings. On the basis of the previous study of the determinants of English language fluency, the positive relationship between the mean level of education and the fluency rate is to be expected. What is surprising, however, is the lack of association between the returns to fluency and the returns to education. Examination of the correlation coefficient between the two returns shows a weak negative association (correlation coefficient -0.25). While there are obvious complementarities between the two types of skills (see in particular Table 2), they have sufficiently different impacts on earnings that separate analyses of each is required.

V. SUMMARY, CONCLUSIONS AND IMPLICATIONS

This study of the determinants of earnings among adult foreign-born men from non-English speaking countries uses the microdata files from the 1990 Census of Population (5 percent sample). The study focuses on the effects on earnings of the respondent's own English language skills, the extent to which others who live in the area in which the respondent lives speak the same foreign language, and the stage of the business cycle at the time of entry into the U.S. labor market.

The analysis demonstrates the importance for earnings of English language fluency. *Ceteris paribus*, the foreign born from non-English speaking countries who are fluent in English earn about 14 percent more than those lacking this fluency. This is about the same effect as that

effect on earnings could arise where immigrants can work in ethnic labor markets that afford protection against discrimination experienced in the general labor market. It is not clear, however, why the estimated impact for immigrants from of Other Asia is so different from that estimated for other birthplace regions.

observed in the 1980 Census (17 percent). The earnings effect is found for immigrants from all non-English speaking countries of origin.

The effect of fluency varies with the extent to which others in the area where the respondent lives speak the same non-English language. Earnings are lower among the foreign born the greater is the intensity of the linguistic concentration. The adverse effect of living in an area with a greater concentration of origin-language speakers is more pronounced among those immigrants more fluent in English. That is, compared to those who are fluent, those who are not fluent in English have relatively greater earnings opportunities inside the linguistic concentration area than outside such an area.

There is strong evidence of endogeneity between language and earnings, as found in the selectivity correction analysis. Those who are fluent are found to be favorably selected for higher earnings in this sector, while the same is true for the unmeasured characteristics of those who are not fluent. Thus, as with other forms of human capital, language skills are acquired, in part, in response to the expected increment in earnings.

There is also strong evidence of complementarity among forms of human capital. The partial effects on earnings of schooling, total labor market experience, duration in the U.S., being married, being a citizen, and weeks worked in the year are greater among those more fluent in English, and are generally very low among those lacking fluency.

Among the foreign born, the stage of the business cycle on entry into the U.S. labor market does influence current earnings overall and among those who are fluent. Earnings are lower for those who enter during a period of high unemployment. Yet this effect is not a permanent scar as the adverse effect of a high unemployment rate at entry diminishes with duration in the U.S. Among those who are not fluent, however, the stage of the business cycle at entry has no effect on earnings.

This paper highlights the important relationship between earnings and English language fluency among the foreign born. English language fluency enhances earnings, and at the same time is itself, in part, a consequence of the expectation of higher earnings. Where one lives

matters as earnings are higher, especially for those fluent in English, among those who do not live in a linguistic concentration area.

These findings have important implications for public policy. They emphasize the value to be had from including English language fluency, or the correlates of English language fluency, in the criteria for rationing immigration visas. They also point to the value of encouraging immigrants to participate in English-as-a-second-language programs either prior to or after arrival in the United States.

Those who live in linguistically concentrated areas have lower earnings, even after controlling for their own language skills, among other variables. This may be reflecting an “ethnic goods” effect, that is, that immigrants sort themselves across the country to equalize real incomes and that “ethnic goods”, including community ties and networking, have a lower cost the greater the concentration of people speaking the same origin language.

The finding of a temporary adverse effect on earnings from entering the U.S. labor market in a period of high unemployment will add fuel to the debate on whether business cycle considerations should be explicitly included in the allocation of immigration visas. This finding may reflect the temporary negative labor market effects of an initial poor job placement of those who came in a recession, or a lesser degree of skill transferability among those who arrive in a recession as they rely more heavily on family ties. Yet the adverse effect is temporary as it diminishes the longer an immigrant has lived in the United States.

APPENDIX A

DEFINITIONS OF VARIABLES

The variables used in the statistical analyses are defined below. Mnemonic names are also listed where relevant. The means and standard deviations are reported in Appendix Table A1 for the total sample and separately for the fluent and not fluent groups.

Data Source: 1990 Census of Population, Public Use Microdata Sample, five percent sample of the foreign born, except where noted otherwise.

Definition of Population: Except where otherwise stated, foreign born men aged twenty-five to sixty-four with earnings in 1989, born in countries other than the English-speaking developed economies (UK, Ireland, Canada, Australia, New Zealand).

Dependent Variable:

Earnings (LNEARN): The natural logarithm of the sum of wage or salary income and self-employment income (either non-farm or farm) received in 1989.

Explanatory Variables:

English Language Fluency (LANG): LANG is set equal to one for individuals who speak only English at home, or if a language other than English is spoken in the home, who speak English either "very well" or "well". The variable is set to zero where a language other than English is spoken in the home and the respondent speaks English either "not well" or "not at all". The categories "very well", "well", "not well" and "not at all" are separately identified in the more extensive specifications of language skills included in some models.

Years of Education (EDUC): This variable records the total years of full-time education. It has been constructed from the Census data on educational attainment by assigning the following values to the Census categories: completed less than fifth grade (2.5 years); completed fifth through eighth grade (7 years); completed ninth grade (9); completed tenth grade (10); completed 11th grade (11); completed 12th grade or high school (12); attended or completed college (14); Bachelor's degree (16); Master's degree (17.5); Professional degree (18); Doctorate (20).

Years of Experience (EXP): This is computed as age minus years of education minus 5 (that is, $EXP = AGE - EDUC - 5$). A quadratic specification is used.

Years Since Migration (YSM). The categorical Census information on year of immigration is converted to a continuous measure using the following values: 1987-1990 (1.75 years); 1985-1986 (4.25 years); 1982-1984 (6.75 years); 1980-1981 (9.25 years); 1975-1979 (12.75 years); 1970-1974 (17.75 years); 1965-1969 (22.75 years); 1960-1965 (27.75 years); 1950-1959 (35.25 years); before 1950 (49.75 years).

Birthplace (BIRTH): A number of non-English speaking birthplace regions are considered in the analyses: Western Europe; Southern Europe; Eastern Europe; former Soviet Union; Indochina; South Asia (which comprises the regions of British influence, for example, India, Nepal, Pakistan); Other South-East Asia; Korea; Japan; Middle East and North Africa; SubSaharan Africa; Mexico; Cuba; Central and South America (Spanish influence); Central and South America (non-Spanish influence). The benchmark group (omitted category) in the regression analysis for the foreign born is Western Europe.

Log of Weeks Worked (LNWW): The number of weeks worked in 1989 is used in natural logarithmic form.

Minority Language Concentration (CONC): Each respondent is assigned a measure equal to the percentage of the population aged eighteen to sixty-four in the state in which he lives, who reports the same non-English language as the respondent. In the construction of this variable, only the twenty-four largest language groups nationwide are considered. In descending order there are: Spanish; French; German; Italian; Chinese; Tagalog; Polish; Korean; Vietnamese; Japanese; Portugese; Greek; Arabic; Hindi; Russian; Yiddish; Thai; Persian; French Creole; Armenian; Hebrew; Dutch; Hungarian; Mon-Khmer (Cambodian). These constitute 94 percent of all responses that a language other than English is used at home. Representation in the other language groups is so small numerically that the proportions are approximately zero, and this value is assigned. Those who reported only English are also assigned a zero value.

Marital Status (MARRIED): This is a binary variable that distinguishes individuals who are married, spouse present (equal to 1) from all other marital states.

Location: The two location variables record residence of a rural area (Rural) or of the Southern States (South). The states included in the latter are: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia.

Race: This is a dichotomous variable, set to one if the individual is Black, and set to zero for all other racial groups (White, Asian and Pacific Islander groups, other groups, American Indian).

Unemployment Rate in the Year of Labor Market Entry(U): These data are the unemployment rate of males aged 20 years and over. Year of labor force entry is obtained from the data on year of entry for the foreign born for whom duration in the U.S. is less than total labor market experience (age minus schooling minus five), and it is year of entry into the labor market (year in which age is years of schooling plus five) for other immigrants. The unemployment rate data are from the Council of Economic Advisers, *Economic Report of the President, 1996*, Washington: U.S. Government Printing Office, Table B-38, p. 324.

Appendix Table A-1
Means and Standard Deviations of Variables^(a)

Variable	Total Sample	Fluent in English	Not Fluent in English
Annual Earnings	27061 (28589)	31092 (31013)	15128 (14110)
Log of Annual Earnings	9.787 (1.03)	9.954 (1.01)	9.292 (0.94)
Education	11.79 (4.92)	13.10 (4.20)	7.926 (4.84)
Experience	22.76 (11.46)	21.46 (10.98)	26.58 (12.00)
Years Since Migration	15.43 (10.85)	16.95 (11.22)	10.92 (8.13)
Log Weeks Worked	3.75 (0.47)	3.78 (0.44)	3.66 (0.55)
Married	0.673 (0.47)	0.696 (0.46)	0.604 (0.49)
Citizen	0.417 (0.49)	0.494 (0.50)	0.192 (0.39)
Race (Black)	0.033 (0.18)	0.041 (0.20)	0.009 (0.09)
Rural	0.057 (0.23)	0.057 (0.23)	0.058 (0.23)
South	0.240 (0.43)	0.237 (0.43)	0.247 (0.43)
S. Europe	0.078 (0.27)	0.089 (0.28)	0.047 (0.21)
E. Europe	0.036 (0.19)	0.041 (0.20)	0.020 (0.14)
USSR	0.013 (0.12)	0.015 (0.12)	0.008 (0.09)
IndoChina	0.041 (0.20)	0.040 (0.20)	0.046 (0.21)
Philippines	0.053 (0.22)	0.068 (0.25)	0.008 (0.09)
China	0.061 (0.24)	0.060 (0.24)	0.062 (0.24)
S. Asia	0.051 (0.22)	0.066 (0.25)	0.008 (0.09)
O. Asia	0.011 (0.11)	0.014 (0.12)	0.004 (0.06)
Korea	0.031 (0.17)	0.029 (0.17)	0.038 (0.19)

Appendix Table 1-A Continued

Japan	0.015 (0.12)	0.016 (0.12)	0.012 (0.11)
Middle East	0.059 (0.24)	0.075 (0.26)	0.011 (0.10)
Sub-Saharan Africa	0.024 (0.15)	0.032 (0.18)	0.003 (0.05)
Mexico	0.279 (0.45)	0.200 (0.40)	0.514 (0.50)
Cuba	0.050 (0.22)	0.048 (0.21)	0.057 (0.23)
C. & S. America (Spanish)	0.127 (0.33)	0.116 (0.32)	0.160 (0.37)
C. & S. America (non-Spanish)	0.009 (0.09)	0.012 (0.11)	0.001 (0.01)
Unemployment Rate at time of Labor Market Entry	5.03 (1.48)	4.91 (1.48)	5.38 (1.42)
Minority Language Concentration (CONC)	7.44 (8.93)	5.65 (8.20)	12.76 (8.89)
Fluent in English	0.748 (0.43)	1.00	0.00
Speaks English Very Well	0.369 (0.48)	0.493 (0.50)	0.000
Speaks English Well	0.268 (0.44)	0.358 (0.48)	0.000
Speaks English Not Well	0.191 (0.39)	0.000	0.755 (0.430)
Speaks English Not at All	0.062 (0.24)	0.000	0.245 (0.430)
Sample Size	212,384	157,725	54,660

^(a) The data are for men who worked and had earnings in 1989, were 25 to 64 years in 1990 and were born in non-English speaking countries.

Source: 1990 Census of Population of the United States, Public Use Microdata Sample, 5 percent sample.

APPENDIX B -- English Language Fluency Equation

APPENDIX TABLE B-1

Logit Estimates of English-Language Fluency, Foreign-Born Males, United States, 1990. ^(a)

Variable	Estimate	t-ratio
Constant	1.188	7.85
Age	-0.056	72.10
Educational Attainment	0.177	115.75
Years Since Migration (YSM)	0.135	30.68
YSM Squared/100	-0.130	23.05
Married	0.188	13.51
Veteran	0.488	10.96
Black	0.613	9.11
Citizenship	0.546	34.96
Rural	0.093	3.21
South	0.135	8.69
Log Weeks Worked	0.178	14.32
Minority Language Concentration	-0.047	39.58
Linguistic Distance	-0.695	4.63
Miles of Origin Country		
from US (10 thousands)	-0.066	0.20
Miles Squared (10 million)	0.326	6.69
<u>Birthplace</u>		
S. Europe	-2.218	23.52
E. Europe	-2.231	22.67
USSR	-2.515	23.13
Indochina	-4.206	24.96
Philippines	-1.641	11.61
China	-3.455	27.51
S. Asia	-2.082	13.58
Other Asia	-3.246	16.90
Korea	-3.345	24.49
Japan	-2.498	18.14
Middle East	-1.440	13.06
Sub Saharan Africa	-1.491	10.12
Mexico	-2.021	20.60
Cuba	-2.292	20.28
C & S American (Spanish)	-1.873	19.22
C & S American (non-spanish)	1.578	6.28
Un Rate Yr. of Labor Market Entry	0.009	0.81
U x YSM	0.002	2.75
<hr/>		
Sample Size		212,385
McFadden's R ²		0.3423

^(a)The data are for men who worked and had earnings in 1989, were 25 to 64 years in 1990 and were born in non-English speaking countries. The dependent variable is LANG.

Source: 1990 Census of Population of the United States, Public Use Microdata Sample, 5 percent sample.

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Table 1**Regression Estimates of Earnings Equations, Adult Foreign Born Men, 1990**

Variable	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Constant	5.056 (172.91)	5.066 (173.20)	5.009 (171.69)	4.969 (167.46)	5.112 (157.43)	5.345 (163.70)
Education	0.049 (91.15)	0.048 (90.21)	0.045 (83.07)	0.045 (82.99)	0.044 (81.61)	0.043 (79.09)
Experience (Exp)	0.023 (35.45)	0.023 (35.56)	0.025 (37.75)	0.025 (37.79)	0.023 (32.38)	0.023 (33.01)
Exp ² /100	-0.037 (30.90)	-0.037 (31.03)	-0.038 (31.82)	-0.038 (31.78)	-0.036 (29.36)	-0.036 (29.67)
Year Since Migration (YSM)	0.028 (49.79)	0.028 (50.25)	0.026 (44.81)	0.026 (44.78)	0.022 (28.30)	0.020 (25.36)
YSM ² /100	-0.041 (32.07)	-0.041 (32.53)	-0.038 (29.88)	-0.038 (29.90)	-0.035 (25.73)	-0.033 (24.71)
Log Weeks Worked	0.968 (135.56)	0.968 (135.51)	0.964 (134.96)	0.964 (134.99)	0.966 (134.87)	0.965 (134.76)
Married	0.214 (55.30)	0.214 (55.57)	0.210 (54.36)	0.210 (54.52)	0.209 (54.11)	0.210 (54.36)
Citizen	0.087 (20.66)	0.084 (20.02)	0.077 (18.19)	0.075 (17.85)	0.077 (18.14)	0.074 (17.65)
Race (black)	-0.185 (12.60)	-0.194 (13.16)	-0.200 (13.62)	-0.201 (13.67)	-0.201 (13.71)	-0.206 (14.05)
Rural	-0.037 (4.68)	-0.043 (5.54)	-0.044 (5.59)	-0.045 (5.76)	-0.045 (5.77)	-0.048 (6.18)
South	-0.113 (26.40)	-0.110 (25.71)	-0.111 (26.07)	-0.112 (26.31)	-0.112 (26.20)	-0.114 (26.58)
<u>Birthplace</u>						
S. Europe	-0.056 (5.59)	-0.053 (5.21)	-0.051 (5.02)	-0.045 (4.49)	-0.051 (5.01)	-0.043 (4.22)
E. Europe	-0.072 (5.97)	-0.072 (6.03)	-0.069 (5.71)	-0.064 (5.32)	-0.067 (5.52)	-0.057 (4.69)

Table 1-continued

USSR	-0.130 (7.18)	-0.131 (7.23)	-0.123 (6.82)	-0.118 (6.53)	-0.122 (6.73)	-0.111 (6.10)
Indochina	-0.276 (22.74)	-0.278 (22.90)	-0.266 (22.00)	-0.256 (21.06)	-0.255 (20.91)	-0.236 (18.99)
Philippines	-0.229 (21.48)	-0.223 (20.94)	-0.233 (21.95)	-0.232 (21.79)	-0.234 (21.99)	-0.235 (21.68)
China	-0.266 (23.46)	-0.263 (23.19)	-0.245 (21.60)	-0.235 (20.68)	-0.238 (20.86)	-0.223 (19.28)
South Asia	-0.013 (1.10)	-0.015 (1.32)	-0.021 (1.82)	-0.021 (1.79)	-0.026 (2.29)	-0.032 (2.73)
Other Asia	-0.195 (10.13)	-0.197 (10.22)	-0.198 (10.28)	-0.196 (10.17)	-0.202 (10.50)	-0.191 (9.91)
Korea	-0.229 (14.69)	-0.230 (14.73)	-0.206 (13.25)	-0.195 (12.51)	-0.195 (12.50)	-0.177 (11.30)
Japan	0.353 (19.06)	0.352 (19.01)	0.362 (19.69)	0.369 (20.03)	0.362 (19.69)	0.379 (20.55)
Middle East	-0.089 (7.57)	-0.091 (7.71)	-0.096 (8.16)	-0.095 (8.07)	-0.100 (8.47)	-0.100 (8.40)
Sub-Saharan Africa	-0.054 (2.85)	-0.051 (2.68)	-0.057 (3.01)	-0.056 (2.98)	-0.061 (3.22)	-0.066 (3.48)
Mexico	-0.333 (36.66)	-0.238 (22.46)	-0.229 (21.67)	-0.222 (20.94)	-0.228 (21.37)	-0.224 (21.07)
Cuba	-0.235 (20.95)	-0.173 (14.70)	-0.159 (13.54)	-0.148 (12.45)	-0.146 (12.34)	-0.146 (12.36)
C. & S. America (Spanish)	-0.239 (25.09)	-0.172 (16.71)	-0.168 (16.35)	-0.158 (15.28)	-0.161 (15.51)	-0.159 (15.39)
C. & S. Amer. (Non-Spanish)	-0.076 (3.37)	-0.070 (3.12)	-0.089 (3.97)	-0.089 (3.97)	-0.089 (3.98)	-0.099 (4.41)
Minority Language Concentration (CONC)	(a)	-0.006 (17.54)	-0.005 (14.31)	-0.002 (5.09)	-0.002 (5.28)	-0.004 (12.32)
Fluent in English	(a)	(a)	0.144 (30.72)	0.186 (24.71)	0.183 (24.36)	(a)

Table 1-continued

Fluent in English* CONC	(a)	(a)	(a)	-0.004 (7.88)	-0.004 (7.69)	(a)
Un. Rate Yr. of Labor Market Entry (U)	(a)	(a)	(a)	(a)	-0.018 (10.37)	-0.021 (11.87)
U*Years in US Labor Market/100	(a)	(a)	(a)	(a)	0.063 (5.34)	0.085 (7.14)
Speaks English Very Well	(a)	(a)	(a)	(a)	(a)	0.018 (2.62)
Speaks English Well	(a)	(a)	(a)	(a)	(a)	-0.088 (11.53)
Speaks English Not Well	(a)	(a)	(a)	(a)	(a)	-0.186 (22.06)
Does Not Speak English	(a)	(a)	(a)	(a)	(a)	-0.194 (18.82)
Adjusted R ²	0.4154	0.4162	0.4186	0.4188	0.4191	0.4204
Sample Size	212,384	212,384	212,384	212,384	212,384	212,384

Notes: Dependent Variable: Natural logarithm of earnings in 1989.
[^]t' statistics in parentheses computed using White's (1980) heteroskedasticity-consistent covariance matrix estimator.

(a)=Variable not entered.

Source: 1990 Census of Population of the United States, Public Use Microdata Sample, 5 percent sample.

Table 2
Regression Estimates of Earnings Equations, by English Fluency,
Adult Foreign Born Men, 1990

Variable	Fluent in English		Not Fluent in English	
	OLS	Selectivity Corrected	OLS	Selectivity Corrected
Constant	5.001 (125.34)	4.720 (141.45)	5.091 (62.40)	5.670 (61.11)
Education	0.056 (83.15)	0.066 (82.10)	0.017 (18.16)	0.010 (6.07)
Experience (Exp)	0.026 (29.51)	0.025 (31.47)	0.011 (8.60)	0.015 (9.81)
Exp ² /100	-0.042 (25.74)	-0.042 (28.11)	-0.020 (9.34)	-0.021 (9.96)
Year Since Migration (YSM)	0.019 (22.45)	0.022 (16.46)	0.024 (10.80)	0.018 (6.45)
YSM ² /100	-0.032 (21.01)	-0.046 (28.89)	-0.040 (11.60)	-0.037 (11.00)
Log Weeks Worked	0.995 (106.83)	1.004 (213.92)	0.902 (83.18)	0.894 (145.83)
Married	0.225 (48.52)	0.239 (50.49)	0.159 (23.23)	0.151 (20.79)
Citizen	0.079 (16.41)	0.095 (19.07)	0.033 (3.70)	0.001 (0.01)
Race (black)	-0.214 (13.43)	-0.197 (12.88)	-0.059 (1.66)	-0.091 (2.44)
Rural Location	-0.040 (4.20)	-0.039 (4.39)	-0.073 (5.98)	-0.078 (5.56)
South	-0.114 (22.74)	-0.111 (22.30)	-0.114 (14.32)	-0.121 (15.12)
<u>Birthplace</u>				
S. Europe	-0.049 (4.69)	-0.057 (5.54)	-0.089 (1.14)	0.055 (0.75)
E. Europe	-0.070 (5.48)	-0.085 (6.83)	-0.141 (1.77)	-0.001 (0.00)
USSR	-0.111 (5.91)	-0.145 (7.80)	-0.321 (3.56)	-0.169 (2.09)

Table 2-continued

Indochina	-0.229 (17.33)	-0.280 (21.02)	-0.467 (5.95)	-0.302 (3.96)
Philippines	-0.234 (21.66)	-0.209 (18.73)	-0.432 (5.10)	-0.393 (5.31)
China	-0.194 (15.90)	-0.251 (21.28)	-0.550 (7.04)	-0.372 (4.81)
South Asia	-0.036 (3.03)	-0.021 (1.83)	-0.380 (4.50)	-0.327 (4.41)
Other Asia	-0.198 (9.85)	-0.199 (10.56)	-0.449 (4.86)	-0.346 (4.03)
Korea	-0.200 (11.37)	-0.278 (18.73)	-0.293 (3.64)	-0.103 (1.30)
Japan	0.330 (16.52)	0.288 (15.88)	0.391 (4.58)	0.545 (6.94)
Middle East	-0.098 (8.16)	-0.088 (8.15)	-0.326 (3.78)	-0.261 (3.60)
Sub-Saharan Africa	-0.052 (2.64)	-0.037 (2.05)	-0.345 (3.57)	-0.311 (3.41)
Mexico	-0.208 (18.13)	-0.248 (20.98)	-0.392 (5.06)	-0.237 (3.19)
Cuba	-0.127 (9.86)	-0.177 (13.31)	-0.291 (3.72)	-0.115 (1.49)
C. & S. America (Spanish)	-0.148 (13.51)	-0.171 (15.56)	-0.323 (4.17)	-0.177 (2.42)
C. & S. America (Non-Spanish)	-0.055 (2.40)	-0.006 (0.27)	-0.381 (2.63)	-0.433 (2.47)
Minority Language Concentration (CONC)	-0.004 (10.35)	-0.007 (15.17)	-0.008 (13.29)	-0.005 (6.19)
Un. Rate Yr. of Labor Market Entry (U)	-0.024 (11.89)	-0.028 (7.94)	-0.003 (0.58)	-0.002 (0.36)
U*Years in US Labor Market/100	0.096 (7.33)	0.213 (8.87)	0.070 (1.85)	0.062 (1.40)
Lambda	(a)	0.281 (19.32)	(a)	-0.146 (4.27)
Adjusted R ²	0.3752	0.3764	0.3847	0.3849
Sample Size	157,725	157,725	54,660	54,660

Table 2-continued

Notes: Dependent Variable: Natural logarithm of earnings in 1989.

(a) = Variable not entered.

Columns (i) and (iii) are estimated using OLS; columns (ii) and (iv) are estimated using Lee's (1983) estimator.

t' statistics in parentheses for columns (i) and (iii) computed using White's (1980) heteroskedasticity-consistent covariance matrix estimator.

Source: 1990 Census of Population of the United States, Public Use Microdata Sample, 5 percent sample.

Table 3

Selected Statistics for Analyses of Earnings for Birthplace Regions, Adult Foreign-Born Men, 1990

Birthplace Region	Mean Log of Earnings	Unadjusted Earnings Difference	Adjusted Earnings Difference	Fluency Rate	Returns to Fluency	Returns to Bilingualism	Impact of Minority Language Concentration	Mean Level of Education	Coefficients of Education	Sample Size
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
Western Europe	10.320	-	-	.990	0.136 (1.73)	-0.016 (0.94)	0.003 (0.65)	14.42	0.078 (25.91)	13,283
Southern Europe	10.116	-0.204 (18.01)	-0.056 (5.59)	.849	0.071 (4.00)	-0.058 (2.95)	0.001 (0.71)	10.96	0.035 (18.01)	16,899
Eastern Europe	10.121	-0.199 (13.93)	-0.072 (5.97)	.859	0.102 (3.82)	0.041 (1.34)	0.008 (1.09)	13.50	0.050 (15.71)	7,467
USSR	10.007	-0.313 (13.13)	-0.130 (7.18)	.841	0.148 (2.45)	-0.050 (0.96)	0.001 (0.09)	14.43	0.058 (9.87)	2,776
Indochina	9.647	-0.673 (48.65)	-0.276 (22.74)	.722	0.161 (7.12)	-0.032 (0.55)	-0.013 (1.13)	11.95	0.025 (9.68)	8,747
Philippines	9.949	-0.371 (30.26)	-0.229 (21.48)	.962	0.071 (1.70)	0.047 (1.79)	-0.011 (3.60)	14.32	0.073 (14.32)	11,508
China	9.838	-0.482 (36.03)	-0.266 (23.46)	.742	0.241 (10.24)	-0.069 (1.60)	0.005 (0.30)	14.15	0.052 (21.55)	12,763
South Asia	10.153	-0.167 (12.32)	-0.013 (1.10)	.959	0.055 (1.36)	-0.072 (2.68)	-0.007 (1.01)	15.83	0.082 (25.27)	10,502
Other Asia	9.937	-0.383 (15.97)	-0.195 (10.13)	.918	0.154 (2.37)	-0.041 (0.80)	0.041 (1.99)	14.80	0.079 (14.80)	2,389
Korea	9.859	-0.461 (26.42)	-0.229 (14.69)	.695	0.188 (5.50)	0.065 (0.97)	-0.010 (0.43)	14.45	0.036 (14.45)	6,438
Japan	10.452	0.132 (6.55)	0.353 (19.06)	.798	0.270 (6.41)	0.027 (0.46)	-0.007 (0.89)	15.14	0.064 (10.17)	3,043
Middle East	10.035	-0.265 (21.02)	-0.089 (7.57)	.952	0.144 (3.28)	0.004 (0.15)	-0.001 (0.19)	14.72	0.074 (24.67)	12,062

Table 3-continued

Sub-Saharan Africa	9.801	-0.519 (30.08)	-0.054 (2.85)	.971	0.072 (1.07)	-0.088 (2.85)	0.001 (0.15)	15.09	0.077 (14.81)	4,413
Mexico	9.387	-0.932 (96.17)	-0.333 (36.66)	.535	0.145 (23.11)	0.095 (4.86)	-0.002 (5.45)	7.90	0.025 (27.09)	61,700
Cuba	9.841	-0.479 (36.50)	-0.235 (20.95)	.710	0.087 (3.88)	-0.114 (2.91)	-0.004 (2.16)	12.01	0.051 (18.59)	10,859
Central & South America (Spanish)	9,647	-0.673 (62.96)	-0.239 (25.09)	.683	0.150 (13.15)	0.094 (4.03)	-0.009 (14.04)	11.54	0.041 (29.01)	25,926
Central & South America (non- Spanish)	9.828	-0.491 (21.10)	-0.076 (3.37)	.989	0.126 (1.74)	0.126 (1.74)	-0.005 (1.00)	12.56	0.034 (5.56)	1,601

n.s. = not statistically significant..

`t' statistics in parentheses computed using White's (1980) heteroskedasticity-consistent covariance matrix estimator.

Source: 1990 Census of Population of the United States, Public Use Microdata Sample, 5 percent sample.