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The Effects of Ethnic Capital and Age of Arrival on the Standard of Living of Young Immigrants

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ABSTRACT. This paper uses a sample of 30 year old male immigrants from the 1990 Census PUMS data to explore the effects that age of arrival and ethnic capital have on the standard of living of immigrants. It finds that both time of arrival and ethnic capital affect immigrants' standard of living through a set of interaction effects and indirect effects. In particular, immigrants who arrive as children enjoy greater returns to human capital investments than immigrants who arrive as young adults. Moreover, immigrants who arrive as children are affected less than young adult immigrants by the ethnic capital of the group that they join in the United States. Further, age of arrival and ethnic capital are found to have indirect effects on immigrants' standard of living through their influence on educational attainment and language proficiency. (J15, J61)

I. Introduction

Although it is widely recognized that the age at which an immigrant arrives in the United States is an important determinant of earnings, there has been relatively little detailed analysis that focuses on how age of arrival affects the returns to investments in human capital and the level of human capital. Instead, the present literature concentrates on the effects of educational attainment and language proficiency on the earnings performance of natives (Borjas 1985, 1994, 1999; Chiswick 1978, 1986, 1991; Chiswick and Miller 1999). There is evidence from descriptive statistics, however, that age of arrival is important. Borjas (1994), for example, presents statistics that show the relative earnings performance of immigrants arriving in the United States between 1960 and 1964. These statistics show that immigrants who arrived as children earned substantially more than those who arrived as adults in each of the next three Censuses (1970, 1980 and 1990) (Borjas 1994, p. 1679). Also, LaLonde and Topel (1992), using 1970 and 1980 Census data, found that,

after controlling for human capital, immigrant wages converge with native wages as years in the United States increase.

Our research departs from the focus of much existing immigration research that considers age of arrival issues, such as the work of Borjas (1994) and LaLond and Topel (1992). Rather than focusing on the measurement of the relationship between age of arrival and wage assimilation, we attempt to address questions concerning how age of arrival interacts with human capital variables to determine an immigrant's standard of living. For example, are the returns to education significantly greater for early arrivals relative to late arrivals? Does the ethnic capital of the immigrant's own ethnic group in the US affect late arrivals more than early arrivals?

This study is also unique because it addresses questions concerning several indirect effects that age of arrival has on immigrants' standard of living. For example, how does arriving early affect standard of living through the indirect path of English language acquisition? And how does arriving early influence standard of living through its effect on educational attainment?

One problem with research using US data to study age of arrival is that the Census micro data most often used for immigration research codes year of arrival in nonuniform intervals rather than discrete values. This makes it impossible to identify the exact age of arrival. This is a serious problem, according to Friedberg (2000), because without knowledge of the specific year of arrival, we cannot know the origin of some of the immigrant's human capital. Without this knowledge, it is not possible to estimate the differentreturns to human capital acquired abroad and domestically.

We get around the Census data problem by selecting a unique sample of immigrants that consists of two groups, both 30 years old in 1990. The first group arrived as children (0 through 9 years old) and thus received most of their education in the United States. The second group arrived as young adults (20 through 29 years old) and thus received most of their education in their country of origin. This sample allows us to effectively estimate how returns differ between child immigrants who received most of their human capital in the United States and young adult immigrants who acquired most of their human capital in their country of origin.

Section II develops a model that focuses on how child immigrants differ from young adult immigrants with regard to returns to investments

in human capital. We refer to this model as the "interaction model" because it interacts age of arrival with many determinants of an immigrant's standard of living. One especially important interaction is between age of arrival and the ethnic capital of the immigrant's ethnic group. Ethnic capital can be defined in general terms as the characteristics of a particular immigrant's ethnic group that affect the economic performance of that immigrant. Following Borjas (1992, 1994, 1999) ethnic capital is proxied by the average educational attainment of an immigrant's ethnic group relative to that of natives. We hypothesize that those who arrive as children will be less influenced by their ethnic capital than those who arrive as adults. One reason to expect this is that children have more opportunity to acquire social and language skills in schools while adult immigrants are more dependent upon their ethnic community. The importance of language proficiency has been an important theme in the work of Barry Chiswick (1991) and Chiswick and Miller (1999).

The "interaction model" presented in Section II focuses on the estimation of the different *returns* to human capital acquisition for child and adult immigrants. Section III, on the other hand, explores how age of arrival and ethnic capital affect standard of living through their influence on human capital *levels*. This model, which is referred to as the "indirect/direct effects model," estimates the direct and indirect effects that age of arrival and ethnic capital have on standard of living. Age of arrival and ethnic capital are seen as indirectly determining standard of living through intervening variables such as education and language acquisition. The estimates presented in Section III show that age of arrival and ethnic capital both have influence on the immigrant's standard of living by influencing the levels of educational attainment and language proficiency.

While the measurement of indirect effects such as these is most common in sociology (e.g. Blau and Duncan, 1967 and Duncan, 1984) it is occasionally used in economics. Israel and Seeborg (1998), for example, use a related model to explore the direct and indirect effects of background characteristics on the standard of living of a sample of young adults who had experienced poverty as children. To our knowledge, economists have not used this approach in the analysis of the economic performance of immigrants.

Finally, this paper focuses on a broad measure of the immigrant's

standard of living rather than on the personal earnings variable that is typically used in immigration research. By defining standard of living as the ratio of total family income to the poverty level of income for that family, we are better able to explore the impact that age of arrival and ethnic capital have on the economic well-being of immigrants. This deviation from the standard human capital earnings variable is, in part, justified by the focus in public debate on immigrant standards of living and related dependency on welfare triggered by low levels of family income. The decision to focus on total family income rather than personal earnings is consistent with literature that treats the choice to immigrate in the context of family decision making (e.g., Borjas, 1991), and with poverty research. Unlike poverty research, however, our study defines the standard of living as a continuous variable (the income to needs ratio) rather than as a dichotomous variable (poor vs. nonpoor). While often used in sociology, the income to needs ratio is not often used in economics as a continuous variable (Israel and Seeborg 1998).

II. Interaction Model

As discussed earlier, a number of economists have examined the effect of time of arrival on immigrant earnings. Chiswick (1978), Borjas (1994), LaLond and Topel (1992), and others have demonstrated a strong relationship between years in the US and immigrants' wages relative to the native population. The basic argument is that immigrants initially lack skills that are specific to the US labor market, such as language skills and job search skills.

One way that time of arrival may affect standard of living is by changing the returns to human capital received by immigrants. In general, immigrants who arrive early in life will have more time to assimilate into US society and should therefore make better decisions regarding human capital acquisition. For example, immigrants who arrive early in life will have the benefit of US schooling which may prove to be more useful in the US labor market than would be the same amount of foreign education. Indeed, immigrants who arrive early in life may see higher rewards to all of their human capital for similar reasons.

This section tests the hypothesis that there are significant differences in the returns to human capital for immigrants who arrive as children compared to the returns for those who arrive as adults. We expect

significant interactions between human capital variables and age of arrival in the determination of standard of living. For example, we expect the proxy for ethnic capital (the average educational attainment of the immigrant group) to negatively interact with early arrival. A finding of a negative interaction effect means that, *ceteris paribus*, the average educational attainment of the immigrant group joined upon immigration affects those who came to the US as children less than it does those who come to the US as adults.

The data used in this paper are from the 1990 five percent Public Use Microdata Series (PUMS) from the US Census Bureau and made available in the form of IPUMS from the University of Minnesota by Ruggles and Sobek (1997). Two immigrant samples were drawn, both consisting of male immigrants who were 30 years old in 1990. The first sample consists of 30-year old immigrants who arrived in the US before their tenth birthday and the second sample is composed of immigrants who arrived after their twentieth birthday. Both samples were restricted to individuals who reported some income in the 1990 census.

Our proxy for ethnic capital (ETHNIC_CAP) was merged into this data set. This variable is defined for each immigrant group as the average educational attainment of immigrant men from that group aged 25-64 who are civilian workers. Borjas (1994, P. 1695) developed this variable using 1990 PUMS data for a large number of countries of origin. Values of ETHNIC_CAP are reported in Appendix Table A-1 for the countries of origin for men in our sample. We assign each of our respondents the value of ETHNIC_CAP that corresponds to his country of origin. A relatively small number of immigrants who were born in countries for which we do not have values of ETHNIC_CAP were deleted from the sample.

We use OLS to test our hypothesis that there will be significant interactions between time of arrival and human capital variables. Logged standard of living is regressed on variables measuring human and ethnic capital, and interaction terms between these variables.

All variables used are defined in Table 1 and summary statistics for these variables are presented in Table 2 which compares 30 year old immigrants who arrived in the US before they were 10 (early arrivals) to those who arrived after they were 20 (late arrivals). Table 2 shows that the income to needs ratio (POVRATIO) is significantly higher for the early arrivals (4.28 versus 3.10). Also, early arrivals have a substantial

human capital advantage, being more likely to have graduated from high school and more likely to report very good English speaking skills. Early arrivals also had an ethnic capital advantage over late arrivals. The last two columns of Table 2 partition the total sample into immigrants who have high levels of ethnic capital (positive ETHNIC_CAP) and those who have low levels of ethnic capital (negative ETHNIC_CAP). The high ethnic capital group has a substantially higher income to needs ratio (4.32 vs. 2.86) and generally higher levels of human capital.

TABLE 1–Variable Definitions

Variable	Definition
Dependent:	
LN (POVRATIO)	The natural log of the ratio of actual total earned family income to the poverty level income for that family.
Background:	
ETHNIC_CAP	The difference between the educational attainment of immigrants from respondent's country of origin relative to mean education of native men.
EARLY	Equals 1 if immigrant came to the US before his tenth birthday.
Intervening:	
VERYWELL	Equals 1 if immigrant rated himself as speaking English very well
COLLEGE	Equals 1 if the immigrant has a college degree.
HS_GRAD	Equals 1 if the immigrant has a HS degree, but not a college degree

TABLE 2–Descriptive Statistics*

Variable	Early Arrival	Late Arrival	High Ethnic Capital	Low Ethnic Capital
Income to Needs Ratio (POVRATIO)	4.28	3.10	4.32	2.87
Ethnic Capital	-0.96	-2.10	n/a	n/a
% Early Arrival	n/a	n/a	37%	18%
% High School Grad	84%	59%	92%	50%
% College Grad	25%	24%	45%	12%
% Very Good English	91%	36%	75%	36%
Sample Size	1754	5319	2541	4532

*High Ethnic Capital is defined as ethnic capital greater than 0. Low Ethnic Capital is defined as ethnic capital less than 0.

The interaction equation is as follows:

$$\begin{aligned} LN(POVRATIO) &= \beta_1 + \beta_2\,(ETHNIC_CAP) + \beta_3\,(VERYWELL) \\ &+ \beta_4\,(HS_GRAD) + \beta_5\,(COLLEGE) \\ &+ \beta_6\,(EARLY * ETHNIC_CAP) + \beta_7\,(EARLY * VERYWELL) \\ &+ \beta_8\,(EARLY * HS_GRAD) + \beta_9\,(EARLY * COLLEGE) \end{aligned} \quad (1)$$

The dependent variable, LN(POVRATIO), is the natural log of POVRATIO. It measures the respondent's relative family income position. POVRATIO is the ratio of actual total family income to the official poverty level. The poverty level is a government statistic that is a function of family size. POVRATIO is a continuous variable that provides more information about the respondent's income relative to the poverty line than a simple poverty-status dummy variable. It also is superior to family income as a measure of living standards because it takes into account the effects that changes in family size can have on living standards.

It is interesting to note that the mean value of POVRATIO in the

1990 Census for the early arriving immigrants in our sample (i.e., those who arrived before their tenth birthday) was 4.28, a value that was far in excess of the 3.10 value for the late arrivals in our sample (i.e., those who arrived between their twentieth and thirtieth birthdays) and even slightly ahead of the 4.09 value for 30 year old natives.

Here, we follow Borjas' (1992a) example by defining a proxy for ethnic capital (ETHNIC_CAP) as the difference between the average educational attainment of recent immigrant men from the respondent's country of origin and the average educational attainment of native men. Borjas' (1994) tabulations of ethnic capital for different immigrant groups based on 1990 PUMS data are merged with our immigrant sample. ETHNIC_CAP values are presented in Table A-1 for each country of origin. These scores range from –5.59 years for the 2,054 respondents from Mexico to 2.74 years for the 273 respondents from India.

Borjas argues that one mechanism through which ethnic capital is transmitted is through neighborhood effects (1995). Many immigrants will naturally choose to live among other immigrants of their same ethnic group who share their language and culture. If an immigrant group has a low level of human capital, then a neighborhood populated by those immigrants may be depressed, "pulling down" immigrants living in that neighborhood. Conversely, immigrants belonging to ethnic groups with high human capital may be "pulled up" by those around them through societal pressures and a more fertile job market. We predict ETHNIC_CAP to positively influence standard of living; that is, the more average years of education the immigrant's ethnic group has, the higher their standard of living should be.

However, we also expect age of arrival (EARLY) to interact with ETHNIC_CAP. Immigrants who arrive as children will have ample time to assimilate into US society before reaching the labor market and will not be as dependent upon members of their own ethnic group when they are young adults. They have the opportunity to acquire US specific human capital and to master English before they enter the labor market. Late arrivals, on the other hand, often enter the labor market shortly after immigrating and are therefore more dependent upon members of their own ethnic group for help. Since we expect ETHNIC_CAP to affect child arrivals less than adult arrivals, we hypothesize a negative coefficient to EARLY * ETHNIC_CAPITAL.

VERYWELL is a dichotomous dummy variable equaling 1 if the

respondent rated himself as speaking English "very well" in the 1990 census, and 0 otherwise. McManus (1985), Chiswick (1991), Borjas (1999), and others have repeatedly shown English language proficiency to be correlated with earnings.

HS_GRAD and COLLEGE are both dummy variables measuring educational capital. Clearly, both of these should have positive coefficients. Moreover, as described above, early arrivals should see higher returns to education than those who arrived as adults because early arrivals receive most of their education in the United States where the instruction is more geared toward US institutions and customs. Late arrivals, on the other hand receive most of their education in their countries of origin. The human capital acquired through education in other countries may not be in English and may not be geared toward the institutions and customs of the US labor market. Therefore, we predict the interaction terms HS_GRAD * EARLY and COLLEGE * EARLY to be positive.

Regression results are summarized in Table 3. All variables are paired with an interaction term between EARLY and that variable. The coefficients to the non-interacted variables; β_2, β_3, β_4, and β_5; are the predicted returns to a one-unit change in that variable for immigrants who arrived as adults. The coefficients to the interaction terms between EARLY and a variable; β_6, β_7, β_8, and β_9; are the difference in returns between early arrivals and late arrivals. For example, β_4 measures the predicted effect of a high school education on standard of living for late-arriving immigrants, and $(\beta_4 + \beta_8)$ predicts the returns to a high school degree to early arrivals.

One additional year of ethnic capital is predicted to increase late-arriving immigrant's standard of living by 4.6% and to increase early-arriving immigrants' standard of living by only 2.2%. This means that ethnic capital levels have greater effects on the standard of living of immigrants who arrive as adults compared to those who arrive as children. For example, the difference due to ethnic capital in standard of living between Mexican and Indian immigrants who came as adults is predicted to be 38.3%, while the same difference is predicted to be only 18.3% for immigrants who arrived as children.

TABLE 3–Regression Estimates of LN(POVRATIO)

Variable	Coefficients	t-Statistics
Constant	.650	24.77***
ETHNIC_CAP	.046	9.99***
VERYWELL	.240	9.38***
HS_GRAD	.211	7.41***
COLLEGE	.274	7.43***
EARLY*ETHNIC_CAP	-.024	-2.87***
EARLY*HS_GRAD	.123	2.01**
EARLY*COLLEGE	.465	6.58***
EARLY*VERYWELL	-.033	-.576
Adjusted R^2	.143	
Sample Size	7073	

Notes: *indicates significance at the .10 level; **indicates significance at the .05 level; and ***indicates significance at the .01 level.

Speaking English very well is predicted to increase standard of living for both early arrivals and late arrivals by 24%. The coefficient to the EARLY*VERYWELL interaction term was insignificant, thus predicting no difference in the return to English language proficiency between early and late arrivals.

A high school degree and a college degree are predicted to increase standard of living by 21.1% and 27.4% respectively for immigrants who arrived as adults. For immigrants who came to the US as children, the returns are predicted to be 33.4% and 73.9%.

To see if the same pattern of results would be obtained using the same model with different dependent variables, we separately regressed logged family income and logged personal income on the same independent variables. The estimated coefficients (not reported) had the same signs and similar levels of significance. The similar pattern of results across the three models provides some evidence of the robustness of the results using LN(POVRATIO) as the dependant variable.

The interaction model thus predicts early arriving immigrants to be at a considerable advantage relative to late-arriving immigrants. Immigrants who arrive before their tenth birthday see, on average, higher returns to education. Most importantly, these early-arriving immigrants are not affected nearly as much by ethnic capital as late-arriving immigrants.

III. Indirect/ Direct Effects Model

While age of arrival and ethnic capital are both determinants of standard of living, they probably also influence education and language, which then affect standard of living. Sociological literature has long emphasized indirect paths such as these (Blau and Duncan 1967; Duncan 1984). More recently, Borjas (1999) and other economists have analyzed specific paths through which background characteristics, like age of arrival and ethnic capital, might affect economic outcomes. The indirect/direct effect model in our paper is drawn directly from a recent study by Israel and Seeborg (1998) on the determinants of transitions out of poverty.

Figure 1 illustrates a set of paths through which age of arrival might influence the standard of living of the respondent. First, both age of arrival and ethnic capital could have direct effects on standard of living. For example, being a member of an ethnic group with high social capital could reduce search cost by creating informal job market connections. Being a member of an immigrant group with low ethnic capital could result in more limited labor market information, fewer informal labor market connections and higher search costs. Therefore, the level of ethnic capital should have a positive direct effect on earnings and living standards.

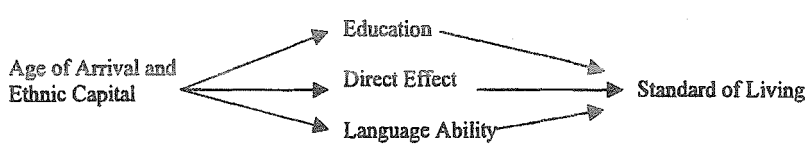


Figure 1. Illustration of Direct and Indirect Paths

Second, age of arrival and ethnic capital can work indirectly through a set of intervening variables to affect the standard of living. In our model, we identify four paths through which ethnic capital and age of arrival can affect standard of living. First, arriving in the US as a child can result in higher levels of educational attainment than coming later. Indeed, summary statistics indicate that 84 percent of the sample of early arrivals had graduated from high school compared to a high school graduation rate of only 59 percent for the late arrivals.

The second path allows ethnic capital to affect standard of living through education. Coming from a group with high ethnic capital could influence the respondent to receive more education. Being surrounded by other people with high education and going to school with children of educated parents will "pull up" immigrants from that ethnic group towards the mean educational attainment of that group. More educated immigrants will be rewarded for their education upon reaching the labor market with higher earnings.

The third path traces the effect of age of arrival on standard of living through English language proficiency. Arriving in the US as children makes it much more likely that immigrants will be able to learn English by the time they reach the labor market. The immigrants are then rewarded for their higher human capital levels.

The fourth path shows the effect of ethnic capital on standard of living through English language proficiency. Immigrants from groups with high ethnic capital levels will interact with people who are better able to impart language skills than groups with low ethnic capital levels.

We hypothesize that ethnic capital and age of arrival have both direct and indirect effects on an immigrant's standard of living. We test this idea and measure the magnitude of the direct and indirect effects using regression analysis. All variables are as defined in Section II.

The first part of the analysis uses OLS regression to estimate LN(POVRATIO) as a function of background variables. The second part estimates LN(POVRATIO) as a function of both background and intervening variables. The first is labeled the "background model" and the second the "overall model."

Background Model:

$$LN(POVRATIO) = \alpha_1 + \beta_{11}(ETHNIC_CAP) + \beta_{12}(EARLY) \qquad (2)$$

Overall Model:

$$LN(POVRATIO) = \alpha_2 + \beta_{21}(ETHNIC_CAP) + \beta_{22}(EARLY) + \beta_{23}(VERYWELL) + \beta_{24}(HS_GRAD) + \beta_{25}(COLLEGE) \quad (3)$$

After estimating the background and overall models, three auxiliary OLS regressions are run for the intervening variables. These are necessary to determine how the three background variables influence each of the intervening variables. Results of the background and overall regressions are summarized in Table 4.

Auxiliary Equations for Intervening Variables:

$$VERYWELL = \alpha_3 + \beta_{31}(ETHNIC_CAP) + \beta_{32}(EARLY) \quad (4)$$

$$HS_GRAD = \alpha_4 + \beta_{41}(ETHNIC_CAP) + \beta_{42}(EARLY) \quad (5)$$

$$COLLEGE = \alpha_5 + \beta_{51}(ETHNIC_CAP) + \beta_{52}(EARLY) \quad (6)$$

To illustrate how these models can be used to evaluate the total, direct and indirect effects of ethnic capital and age of arrival on LN(POVRATIO), consider the effects of a change in ETHNIC_CAP on LN(POVRATIO). The following total derivative partitions the total effect into direct and indirect effects.

$$d\ln(POVRATIO) / dETHNIC_CAP = (\delta \ln(POVRATIO) / \delta ETHNIC_CAP) + (\delta \ln(POVRATIO) / \delta VERYWELL) * (\delta VERYWELL / \delta ETHNIC_CAP) + (\delta \ln(POVRATIO) / \delta HS_GRAD) * (\delta HS_GRAD / \delta ETHNIC_CAP) + (\delta \ln(POVRATIO) / \delta COLLEGE) * (\delta COLLEGE / \delta ETHNIC_CAP) \quad (7)$$

The total derivative on the left hand side represents the total effect of a change in ETHNIC_CAP on LN(POVRATIO). The equation decomposes the total effect into a direct effect and three indirect effects.

The first partial derivative ($\delta LN(POVRATIO)/\delta ETHNIC_CAP$) is the direct effect. It is estimated by the coefficient of ETHNIC_CAP in

the "overall model" (Table 4) that includes all background and intervening variables. Each of the three products following this direct effect is an indirect effect. Each indirect effect is estimated in two steps. To illustrate, consider the indirect effect of ETHNIC_CAP on LN(POVRATIO) through its effect on our proxy for language ability (VERYWELL). The first term, (δLN(POVRATIO)/δVERYWELL), is the coefficient of the intervening variable VERYWELL in the overall model. The second term, (δVERYWELL/δETHNIC_CAP), is estimated as the coefficient of ETHNIC_CAP in the auxiliary regression to predict the intervening variable VERYWELL. The product of these two coefficients is an estimate of the indirect effect of ETHNIC_CAP on LN(POVRATIO) through VERYWELL. The remaining five indirect effects (the effects of ETHNIC_CAP on POVRATIO through HS_GRAD and COLLEGE and the effects of EARLY on LN(POVRATIO) through HS_GRAD, COLLEGE, and VERYWELL) are computed in a similar manner. The sum of the three indirect effects is the total indirect effect.

Table 4 presents the results of OLS estimation of LN(POVRATIO) for the background model and the overall model. The background model includes only the ethnic capital and age of arrival variables as independent variables. The "overall model" adds the three intervening variables to the background model.

TABLE 4–Regression Estimates of LN(POVRATIO)
(t statistics in Parentheses)

Variable	Background Model	Overall Model
Constant	.939 (68.30)***	.601 (24.06)***
ETHNIC_CAP	.076 (22.27)***	.037 (8.96)***
EARLY	.338 (14.18)***	.203 (7.66)***
VERYWELL		.223 (9.19)***
HS_GRAD		.226 (8.69)***
COLLEGE		.399 (12.28)***
Adjusted R^2	.104	.139
Number	7073	7073

Notes: * indicates significance at the .10 level; ** indicates significance at the .05 level; and *** indicates significance at the .01 level.

Including time of arrival and ethnic capital in the background regression (Table 4) produced significant and large coefficients for both EARLY and ETHNIC_CAP. For example, the coefficient to EARLY in the background model indicates that immigrants who came before their tenth birthday have a standard of living (POVRATIO) almost 34 percent higher compared to those who arrived after their twentieth birthday, after controlling for ethnic capital. An additional year of average educational attainment by the respondent's ethnic group (ETHNIC_CAP) is predicted to raise that immigrant's standard of living by 7.6 percent, *ceteris parabus*.

However, after controlling for intervening variables in the "overall model" (Table 4), the coefficients to EARLY and ETHNIC_CAP decrease by nearly 50 percent. The coefficients remain statistically significant. The coefficients to each of the three intervening variables are significant with the correct sign.

The auxiliary regression results for the three intervening variables appear in Table 5. Each intervening variable (VERYWELL, HS_GRAD, and COLLEGE) is regressed against the two background variables. All coefficients were statistically significant and have the expected sign. As expected, ethnic capital has a positive effect on English language skills (VERYWELL) and education (HS_GRAD and COLLEGE).

TABLE 5–Regressions of Three Intervening Variables on Background Variables ETHNIC_CAP and EARLY (t-statistics in parentheses)

Variable	VERYWELL	HS_GRAD	COLLEGE
Constant	.467	.394	.364
	(69.59)	(51.14)	(58.43)
ETHNIC_CAP	.049	.019	.061
	(29.21)	(9.76)	(39.18)
EARLY	.489	.214	-.055
	(42.00)	(15.99)	(-5.11)
Adjusted R^2	.305	.055	.178
Sample Size	7073	7073	7073

Age of immigration (EARLY) also had the expected effects on the intervening variables. The immigrants in our sample who arrived before their tenth birthday were much more likely to acquire very good language skills and to have at least a high school diploma compared to those who arrived after their twentieth birthday. These results suggest that there could be significant indirect effects, as both ethnic capital and age of arrival determine the intervening variables, which in turn determine standard of living.

To determine the magnitude of the direct and indirect effects of background variable on immigrants' standard of living, we followed the procedure described above. The results are presented in Table 6. The "total effect" of each background variable on LN(POVRATIO) is that variable's coefficient in the "background model" presented in Table 4. Recall that this model includes both background variables but does not include the four intervening variables. Therefore, the total effect should be interpreted as the influence of each background variable on standard of living, after controlling for the effects of the other background variable.

The direct effects reported in Table 6 are the effects of each background variable on LN(POVRATIO) after controlling for all background and intervening variables. Each of the direct effects is the coefficient to the background variables (ETHNIC_CAP and EARLY) in the "overall model" presented in Table 4. The indirect effects in Table 6 are the total effects minus the direct effects.

TABLE 6–Total, Direct and Indirect Effects of Background Variables ETHNIC_CAP and EARLY on LN(POVRATIO) (t-statistics in parentheses)

Background Variable	Total Effects	Direct Effects	Indirect Effects
ETHNIC_CAP	.076 (22.27)	.037 (8.96)	.039
EARLY	.338 (14.18)	.203 (7.66)	.135
Sample Size	7073	7073	7073

As mentioned above, each indirect effect reported in Table 6 consists of the sum of three paths. The indirect effect paths are computed from the coefficients in the auxiliary regressions and the overall model. Each indirect effect can be thought of as the total influence of the background variable on LN(POVRATIO) through the three intervening variables. The indirect effect of ETHNIC_CAP, for example, is the sum of the indirect effects of ETHNIC_CAP on LN(POVRATIO) through HS_GRAD, COLLEGE, and VERYWELL.

The indirect effect of each background variable on LN(POVRATIO) is partitioned into three components, as each background variable can operate through three intervening variables. Since there are three indirect effects for each background variable and two background variables, there are a total of six indirect effect components in our model. Each is computed as the product of the coefficient to the background variable found in the appropriate auxiliary regression in Table 5 multiplied by the intervening variable coefficient from the overall model in Table 4.

Table 7 presents the computed indirect effects. The most important indirect paths through which background variables affect LN(POVRATIO) are the immigrant's proficiency with English (VERYWELL). For example, arriving as a child relative to arriving as an adult is expected to increase immigrant standard of living by 11.1% solely through early arrival's positive influence on English language proficiency. Likewise, Indian immigrants (the group with the highest assigned ethnic capital value) are predicted to have a standard of living 20% higher than Mexican immigrants (the group with the lowest assigned ethnic capital value) solely through ethnic capital's influence on the likelihood of the immigrant to graduate from college.

The descriptive statistics presented in Table 2 show that a roughly equal proportion of early and late arrivals graduated from college. However, the auxiliary regression presented in Table 5 predicts that, after controlling for ethnic capital, the early arrivals are actually less likely to graduate from college and thus EARLY has a negative effect on COLLEGE. This means that early arrivals are less likely than late arrivals to complete college than would be predicted by their ethnic capital levels. We attribute this unexpected result to the many adults who immigrate to the US for the purpose of attending college or graduate school. Hence, the selectivity inherent in student immigration causes our model to produce the unexpected result that immigrants who arrive as

children are less likely to graduate from college.

TABLE 7–Estimated Indirect Effects of Background Variables on LN(POVRATIO) through Intervening Variables*

Background Variable	VERYWELL	HS_GRAD	COLLEGE
ETHNIC_CAP	.011	.004	.024
EARLY	.114	.048	-.022
Sample Size	7073	7073	7073

Note: Indirect effects are calculated from regression estimates presented in Table 4 and Table 5.

IV. Conclusions

This study explored the effects of age of arrival and ethnic capital on the standard of living (POVRATIO). Using a sample of 30 year old male immigrants from the 1990 Census PUMS data, we found that both time of arrival and ethnic capital affect an immigrant's standard of living through a set of interaction effects (Section II) and indirect effects (Section III). These findings add some insights to the existing literature, which does not take interactions and indirect effects into account when considering the effect of age of arrival on wages and incomes (e.g., Borjas, 1994; LaLonde and Topel, 1992). The results have revealed a number of mechanisms that give an advantage to early arrivals.

Immigrants who arrive as youth clearly enjoy greater returns to human capital investments than immigrants who arrive as young adults upon reaching the labor market. Education in the US is an important part of the assimilation process as early immigrants acquire language proficiency and gain knowledge of US culture and economy. On the other hand, immigrants who arrive as young adults need to depend more on their ethnic community to adjust to the US economy. In fact, we found a strong interaction between age of arrival and ethnic capital. While young adult immigrants will experience lower standards of living because of their low ethnic capital, immigrants who come as young children will be affected much less by the average performance of their

ethnic group. Also, the results of the interaction analysis suggest that early arrivals experience greater returns to education than late arrivals.

The indirect/direct effects model of Section III showed that both time of arrival and ethnic capital have indirect effects and direct effects on immigrants' standard of living. For example, arriving early has a significant direct effect on standard of living, and also has positive indirect effects through English language proficiency and educational attainment. Similarly, ethnic capital has a strong direct effect on standard of living as well as positive indirect effects through English language proficiency and educational attainment.

Taken as a whole, the results of this study indicate that both age of arrival and ethnic capital are important to immigrants, but that much of their influence comes through interaction effects and indirect effects that are not generally considered in the literature. To the extent that changes in US immigration policy can influence age of arrival and the national origin composition of the immigrant population, the effects on immigrant standard of living will be great.

Appendix

TABLE A-1: Appendix Table on Ethnic Capital levels by Country of Origin

Country	Ethnic Capital*	Sample Size
Europe		
Austria	1.48	7
Czechoslovakia	1.26	12
France	1.56	110
Germany	.68	342
Greece	-1.37	61
Hungary	.39	5
Italy	-2.3	116
Poland	-.43	114
Portugal	-4.91	56
U.S.S.R.	1.03	59
United Kingdom	1.40	204
Yugoslavia	-1.45	39
Asia		
Cambodia	-2.98	53
China	-.38	172
India	2.74	273
Iran	2.32	74
Japan	1.98	238
Korea	1.05	189
Laos	-3.22	90
Lebanon	.96	48
Philippines	.85	320
Taiwan	3.12	144
Vietnam	-.94	246
North and South America		
Argentina	.15	45
Canada	.59	266
Colombia	-1.12	168
Cuba	-1.46	271
Dominican Republic	-2.92	149
Ecuador	-1.65	84
El Salvador	-4.59	321
Guatemala	-3.97	137
Haiti	-1.98	117
Jamaica	-1.23	97
Mexico	-5.59	2,044
Nicaragua	-1.47	108
Peru	-.21	89
Africa		
Egypt	2.42	38
Ethiopia	.77	31
Nigeria	2.60	95
South Africa	2.71	15
Australia	2.01	26

*Ethnic capital is defined as the difference between the average educational attainment of all immigrants from the country of origin minus the average educational attainment of native born Americans. A positive figure for ethnic capital indicates that the immigrant group average educational attainment exceeds the native born average and a negative figure indicates that the immigrant group average is less than the native born average. Ethnic capital values are from Borjas (1994).

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