

Differences in Rates of Return to Education: Immigrant and Native Men in the 1980's

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I. INTRODUCTION

The past two decades have seen the debate over immigration policy revived by changes in three main indicators. First, the number of immigrants entering the US increased from (roughly) 3.3 million in the whole of the 1960's to 1 million per year in the 1990's. Second, those that arrived after 1970 came with considerably lower skills relative to comparable US natives than did previous cohorts of immigrants. Finally, the wage differential between recently arriving immigrants and US natives widened considerably from -16.6% in 1970 to -27.6% in 1980, and finally to -31.7% in 1990 (Borjas 1994).

These trends show that the performance of immigrants in the US labor market is increasingly relevant not only to immigration policy relating to the rationing of visas, and laws pertaining to illegal immigration, but also to the labor market performance of natives. Chiswick (1978) notes that changes in the skills of immigrants may alter the effects of immigration on the level of income of the native population and on the distribution of this income among groups defined by skill. The growing number of immigrants in recent decades can be interpreted as larger immigrant shares of the US work force. The widening immigrant/native skills differential suggests that the growing immigrant portion is largely under-skilled *relative* to the US standard.

The growing immigrant/native wage differential is best seen as the result of both demand and supply-side factors. Following Borjas (1985, 1995), many economists claim that it derives from declining relative immigrant skill levels. At an important point in the analysis of recent immigrant performance, this assessment is appropriate. However, the complexity of the wage determination process – by which human capital and other skills and worker characteristics are translated into wage rates in the labor market – discourages any assessment that considers only one side

of the labor market. Looking toward the demand side of labor, evidence suggests that while major changes occurred in the composition of immigrant labor supply, it is also clear that the employment opportunities available to earlier generations of

immigrants have been cut short for those arriving in the past two or three decades. The assimilation success experienced by generations that arrived prior to the 1960's occurred predominantly in a goods-producing economy where seven out of every ten Americans were employed in either manufacturing, agriculture, or mining (Waldinger, 1983). Such employment did not necessarily demand a college education or computer skills to warrant a reliable, middle class salary.

The engine driving the economy of the past few decades is somewhat of a different model. By the

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early 1980's, goods production furnished employment for only three out of every ten workers, and the number of manufacturing jobs – at one point the most promising opportunity for incoming immigrants – had remained virtually stagnant for much of the previous decade (Waldinger 1983), also see Berman et al 1994). LaLonde et al (1991) notes that wages and employment prospects of less-skilled Americans have fallen dramatically at a time when new immigrants are entering the United States in the largest numbers in recent history. Additional evidence of the changes occurring in US employment opportunities is the post-1979 proliferation of low-wage employment in the service sector (see Bluestone et al 1988).

While natives and immigrants are bringing different levels of education to the labor market, it is possible that these changing opportunities for US employment are affecting the rates of return to the determinants of both immigrant and native income.

Since the most popular explanation for the relatively poor labor market performance of immigrants after the 1970's is their relatively lower level of skills, our analysis focuses on the different rates of

return that immigrants and natives experienced for three different levels of education in 1980 and 1990. The purpose of the paper is to assess the possible causes of any differences between immigrant and native rates of return to education.

It is the main hypothesis that after controlling for other forms of human capital and additional worker characteristics, native workers experienced greater rates of return to the attainment of 12 years, 14 years (some college) and 16 years (college degree) of education respectively in 1980 and in 1990. Additionally, it is hypothesized that the rates of return to all three levels of education grew between 1980 and 1990 for both groups, and that they grew the most for 16 years (college degree) of education. This second hypothesis is intended to show growth rates in immigrant and native returns to education that might provide insight into the determinants of the rate-of-return differences

posited in the first hypothesis. More specifically, some economists (Berman et al, 1994) have cited observed growth in the relative demand for skilled labor in the 1980's as a likely cause of the larger increase in the number of jobs requiring high skills relative to those requiring low skills. It is possible that this higher relative demand for skilled labor is benefiting both groups.

Applying human capital theory to immigrant assimilation, section II reviews the literature on declining *relative* immigrant skill levels and declining relative immigrant wages between 1970 and 1990. Also, section II observes changes in the rates of return to different levels of education experienced by all male workers and the changing labor market conditions that occurred over the same period. Section III explains the data and empirical model used to estimate the rates of return to education experienced by immigrants and natives in 1980 and 1990. Since the

real argument regarding these differences in rates of return lies in their interpretation, section IV delivers the results and then attempts to make sense of them with traditional explanations. Section V gives concluding remarks, policy implications and sug-

gestions for further research.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

A. Human Capital Theory and the Assimilation of Immigrants

Through much of the 1980's and early 1990's, most of what was considered common place economic theory regarding the integration of human capital theory and immigrant assimilation came from the work of Barry Chiswick. With it we assume that those choosing to bear the risks and costs associated with migration to the US do so with two incentives. First, they have an incentive to leave their source country. Second, they have an incentive to migrate specifically to the United States. Once in the US such immigrants may make investments in the kind of

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human capital that will translate into higher wages.

Both Chiswick (1978) and Carliner (1980) defend this notion that the ability and determination necessary to follow through with the decision to immigrate encourages immigrants to expand their stock of US human capital. Their theory asserts that upon arrival immigrants will accept lower wages in the short run in order to make the investments in human capital that hold the promise of higher wages in the long run. Chiswick (1978) estimated this period of investment and assimilation at roughly 10-15 years, after which the wages of most immigrants are said to converge on – and some to overtake – those of natives. For this to happen, immigrants must show higher rates of return to additional years of US work experience than natives; at least for the first 10-15 years. This representation of the assimilation process puts immigrant performance in the US labor market under a very positive light. The figures given by Chiswick (1978), Carliner (1980) and Borjas (1985, 1995) estimating wage trends for immigrant groups relative to natives show that up until the arrivals of the early 1970's, this depiction was a fairly accurate portrayal of immigrant performance.

As Borjas (1985) argues, the theory becomes too optimistic when applied to the immigrant cohorts arriving after 1970 largely due to the effects of the 1965 amendments to US immigration policy. These policy changes reshaped the national origins mix of incoming immigrants from one largely composed of developed, industrialized countries to one dominated by less-developed countries. Before 1965, close to 68% of immigrant inflows came from Europe or Canada. Asian countries contributed (roughly) 6% while Mexico and other Latin American countries delivered 15%. In the 1990's European and Canadian inflows were down to 16% while Latin American countries (including Mexico) contributed 50%; Asian inflows were up to 32% (Borjas 1994). Borjas shows that these alterations in the major source countries, coupled with the volatile political and economic conditions in some of them, allow us to conceptualize the mechanism that increased the immigrant inflow and simultaneously decreased its average skill levels relative to US natives.

Assuming these trends persist for new immigrant inflows, Borjas (1985, 1995) estimated that the growing skill disparity between immigrants and natives would keep many of the post-1975 arrivals from reaching wage parity with natives. What Borjas'

cohort analysis shows is that while most immigrants of varying skill levels experience some positive percentage growth in wages from the time they arrive in the US to the time they retire, each successive wave of new immigrants from the early 1970's onward has shown successive declines in arrival wages. While the 1965-69 arrivals reduced their wage disparity with natives from earning 18.1% less in 1970 to earning 1.1% more in 1990, the 1975-79 arrivals started with an even greater disparity in 1980 (-32.2%) (Borjas 1995). The arrival wage gap was even worse in 1990 for the 1985-89 arrivals (-38.1%). While the within-cohort growth of wages for each group averages out to an 8-10% improvement after 10 years of experience in the US labor market, the across-cohort growth shows steadily worsening arrival wages for immigrants. Adding this assessment to the observed growth in the immigrant/native skills disparity suggests that greater wage inequality after 1970 resulted predominantly from declining *relative* immigrant skills.

As was mentioned earlier, this is very much a supply-side assessment of the wage gap. A closer look at the growing skills differential between immigrants and natives shows that while much of the attention is focused on “declining relative skills of immigrants”, the skill levels of the entire immigrant workforce have improved; an observation endorsed by Lalonde et al (1991). Observing the 1970's, they note that the average (relative) “quality” of new immigrants declined during the decade, even though average school levels suggest no decline in quality within immigrant groups (LaLonde et al 1990). From 1970 to 1990, the entire immigrant workforce reduced its percentage of high school dropouts from 48% to 37% and increased its percentage of college graduates from 19% to 26.6% (Borjas 1994).

These figures show that while recently arriving immigrants may possess fewer skills relative to natives, the immigrant workforce taken as a whole experienced steady improvement. The greatest changes, in fact, occurred in the skill attainment of natives. From 1970 to 1990, native working men decreased their percentage of high school dropouts from 39.6% to 15% and increased their percentage of college graduates from 15.4% to 26.6%. These trends do reflect a growing skill disparity between immigrants and natives, but one that is more accurately characterized by a greater *relative* skill accumulation by native workers in the 20 year period.

B. Changing Labor Market Conditions and the Returns to Education

Theoretically, the educational improvements for both groups translate into a growing supply of educated workers in the labor market; but the bulk of this increase – as the skill disparity shows – is coming from the native labor force.

Momentarily ignoring the immigrant/native distinction in order to observe labor supply changes by educational attainment for different age groups of US workers, Table 1 shows that between 1971 and 1979 the two largest age groups in the male labor force (aged 25-34 and 35-44) increased their share of high school graduates by 13% and 12.36% and their shares of college graduates by 85% and 29.26%. Between 1979 and 1987, these age groups had 40% and 29% more high school graduates and 32% and 102% more college graduates (Levy et al 1992).

These dramatic changes in labor supply must have produced diverse effects both generally on earnings and specifically on the earnings premium associated with education. Now, competitive wage theory asserts that in the event of constant demand for skilled and unskilled labor, wage fluctuations will result from changes in the relative supply of skilled and unskilled labor. An increase in the supply of college-educated labor would have the effect of decreasing the rate of return to a college degree. Surveying the literature on US earnings levels and earnings inequality, Levy et al (1992) conclude that the 85% increase in the supply of college educated workers [aged 25-34] was the single most important factor contributing to a noticeable reduction in the earnings premium associated with a college education in the 1970's.

However, in spite of an additional 32% [aged 25-34] and 102% [aged 35-44] of college educated workers between 1979 and 1987, college graduates experienced higher rates of return to their education over the 1980's. This created a considerable disparity in the costs of employing high school and college graduates. If firms with a non-specific demand for labor experience such a difference in employment costs, they should substitute the relatively cheaper high school educated worker for the relatively more expensive college educated worker. The evidence for

Table 1

Percentage Change in Labor Supply by Years of Education

Age	Yrs. of Completed Education	Percentage Change	Percentage Change
		1971 -1979	1979 -1987
25-34	12	+ 13.11	+ 40.23
	16	+ 84.95	+ 32.23
35-44	12	+ 12.36	+ 29.02
	16	+ 29.26	+ 102.10
45-54	12	- 5.45	+ 13.75
	16	+ 24.07	+ 26.90

manufacturing industries in the 1980's shows that this did not happen. Levy et al (1992) observe that while the number of 25-34 year old male high school graduates employed in manufacturing increased by 6% between 1979 and 1987, the number of male college graduates employed in manufacturing increased by 34%. This inability to substitute low-skilled labor for high-skilled labor increases the rate of return to higher levels of education.

Berman et al (1994) also observe a shift in the skill content of the labor force employed by manufacturing industries during the 1980's. Between 1979 and 1989 the employment of production (low-skilled) workers in US manufacturing dropped by 15 percent from 14.5 million to 12.3 million, while non-production (skilled) employment rose 3 percent from 6.5 million to 6.7 million (Berman et al 1994). They note further that with this increase in the non-production (skilled) share of manufacturing employment, the relative wages of non-production workers also increased. The simultaneous increase of employment shares and wage rates for a particular group of workers strongly suggests an increased demand for the labor provided by that group. If this explanation accurately portrays manufacturing industries in the late 1970's and 1980's, then college-educated workers experienced higher demand for their labor, which causes an increase in their rate of return to education.

The question remains where to put the working immigrant in this assessment. First of all, the shift in labor demand towards skilled workers in the 1980's affected most the manufacturing industries which provided the best employment opportunities for incoming immigrants prior to the 1970's. Also, pairing Borjas' observation of declining relative immigrant wages with the fact that larger numbers of incoming immigrants originated from countries with relatively less-developed education systems suggests not only that immigrants brought relatively lower lev-

els of education over the 1980's, but also that the low transferability of "less-developed" education reduced their relative rates of return to similar levels of education. For these reasons we test the following two hypotheses: (1) After controlling for other forms of human capital and additional worker characteristics, native workers experienced greater rates of return to the attainment of 12 years, 14 years (some college) and 16 years (college degree) of education respectively in 1980 and in 1990. (2) The rates of return to all three levels of education grew between 1980 and 1990 for both groups, but they grew the most for 16 years (college degree) of education.

III. DATA AND EMPIRICAL MODEL

The data used in this model come from pooled cross-sections of 1980 and 1990 population-representative 1% samples both extracted from IPUMS (Ruggles, et al). They consist of earnings (pre-tax wage and salary income) for immigrant and native males between 25 years and 65 years of age in the full calendar year preceding each census. Earnings are expressed in contemporary dollars and top-coded at \$75,000 in 1970 and \$140,000 in 1990. Cases of \$0 earnings were excluded. The remaining samples consist of 30,629 immigrants and 402,650 natives in 1980, and 52,733 immigrants and 460,164 natives in 1990.

The purpose of the research design is to estimate the rates of return to different levels of education for immigrants and natives in both sample years. To do this earnings functions are developed for natives and immigrants for 1980 and 1990. The use of OLS regression in analyzing these earnings functions will provide the means of testing our hypotheses. The independent variables include three dummy variables for each level of education and control variables for other forms of human capital and worker characteristics. Abbreviated forms of the earnings functions are as follows:

$$(1) \ln(W_N) = \alpha_N + \beta_N' \text{Educ}_N + \theta_N' \text{EngSk}_N + \delta_N' \text{WC}_N + \epsilon_N$$

$$(2) \ln(W_i) = \alpha_i + \beta_i' \text{Educ}_i + \theta_i' \text{EngSk}_i + \delta_i' \text{WC}_i + \gamma_i' \text{Imm}_i + \epsilon_i$$

where:

$\ln(W_i)$ = natural logarithm of wage and salary income of the i^{th} worker

α_i = constant

β_i' = vector of coefficients (3) for different education levels

Educ_i = vector of dummy variables (3) for different education levels

θ_i' = vector of coefficients (3) for English proficiency

EngSk_i = vector of dummy variables (3) for English proficiency

δ_i' = vector of coefficients (5) for various worker characteristics

WC_i = vector of variables (5) for worker characteristics

γ_i' = vector of coefficients (3) for immigrant-specific characteristics

Imm_i = vector of variables for immigrant-specific characteristics

ϵ_i = disturbance term

Of primary concern are the coefficients for different education levels. I created 4 dummy variables according to estimated years of acquired education. The first variable, *CEduc*, measures whether a worker has a Bachelor's degree or more (16 or more years of education). The second, *SCEduc*, measures whether a worker has any college experience (1 to 3 years), and *HSEduc* stands for workers who have either acquired a high school diploma, a GED, or simply finished a 12th year of school. The omitted group (*LEduc*) consists of those with less than 12 years of education. Due to coding differences for the two census years, the *HSEduc* variable is ambiguous in distinguishing a high school diploma from a GED, and from the completion of just 12 years of education. A more specific variable for high school graduates would have been more meaningful, however, the data did not permit it. Table 2 gives descriptive statistics for the variables in all four samples.

To estimate the number of years spent in the US labor market I define a proxy for actual work experience. The appropriate estimation of work experience hinges on the age at which the individual started work in the US, and it implicitly assumes that time out of the labor market is not taken. Unfortunately, samples meeting these strict requirements are not available, so we estimate potential US work experience with the available data. For natives this estimation follows simply as:

TABLE 2
Descriptive Statistics for all Variables

Variables	1980		1990		Definitions
	Immigrants	Natives	Immigrants	Natives	
Ln(Wi)	\$16,257.40	\$18,021.95	\$27,104.95	\$31,089.89	Income
Educi					
CEduc	25.7%	23.3%	26.8%	25.9%	College degree (%)
SCEduc	15.1%	18.7%	20.4%	28.1%	Some college (%)
HSEduc	22.3%	35.1%	22.3%	33.7%	12 yrs. of educ. (%)
EngSki					
EngW	24%	1.3%	23.1%	0.9%	Speaks Eng. well (%)
EngNW	14.8%	4.0%	16.4%	0.3%	Not well (%)
EngNO	5.7%	0.0%	5.7%	0.0%	No English (%)
WCi					
USExp	13.48	22.55	14.57	21.6	U.S. work experience
USExp^2	--	--	--	--	Experience Squared
MS	76%	77.3%	66.7%	71.2%	Marital Status (%)
KID	1.37	1.18	1.24	1.0	# of children in house
HISP	33.5%	3.6%	43.6%	3.5%	Hispanic Ethnicity (%)
SSEC	55 %	57.3%	59.5%	60.6%	Service Sector (%)
Immi					
AgeMig	27.34	--	25.63	--	Age at Migration (yrs.)

(2) $USExp = Age - Educ - 6$

where:

USExp = Potential experience in the US labor market

Age = Age at the time of the census

Educ = Years of education

The number 6 represents the estimated starting age of the education process. Obviously, not all cases will follow this assumption. However, for natives especially it is appropriate to assume that enough cases will follow it to preserve the explanatory power of the variable. This proxy will suffice for immigrant cases as well so long as the immigrant's arrival to the US precedes the last year of acquired education. Where this is not the case (e.g., immigrants arriving in or after the last year of acquired education), the following estimate is used instead:

(3) $USExp_i = CenYr - YrImmig_i$

If: $Age@Mig_i \geq Educ_i + 6$

where:

USExp_i = Potential experience in the US labor market

CenYr = Census year

YrImmig_i = Estimated year of migration

Age@Mig_i = Estimated age upon migration to the US

Educi = Years of education

Since this estimate of US labor market experience is measured continuously, the wide age interval used in the samples necessitates the inclusion of a polynomial transformation of US work experience in the earnings functions (**USExp²**). This allows our estimate of earnings variation to accommodate the diminishing returns to additional years of labor market experience. An important point is that for those immigrants who arrived in the US after completing their education, equation (3) is a measure of years since migration; which allows the **USExp** variable to capture – for many of the immigrant cases – the full scope of wage effects resulting from the number of years an immigrant has been in the US. Now, for those immigrants estimated to have arrived before finishing school, the younger an immigrant happens to be at migration the more the experience variable will strictly reflect time spent working in the US labor market instead of total years since migration. To control for the variation in earnings due to these cases of early arrival to the US I include a continuous variable for age at migration (**AgeMig**).

A vector of dummy variables measuring English deficiency is also included in the earnings function.

Language Classification

- (1) Does not speak English
- (2) yes, speaks English...

Variable

EngNO
.....

- (3) yes, speaks only English
- (4) yes, speaks very well
- (5) yes, speaks well **EngW**
- (6) yes, but not well **EngNW**

Three variables were created from language groups (1), (5), and (6) and a composite of (2), (3) and (4) formed the omitted group. Since these variables identify those with a particular language deficiency, as compared to speaking either very well or fluently, it is expected that both groups in both census years will experience negative returns to any language deficiency, and increasingly so with greater levels of deficiency.

A vector of control variables for additional worker characteristics is also included in the model. Marital status (**MS**) is one of these, and it identifies married workers with their spouse present. Recent observations of the declining shares of married men in the labor force suggest that this measure will serve as more than a control variable. Blackburn (1990) estimates that the growth in the proportion of men in the labor force who are unmarried (12.4% in 1967 and 25.4% in 1985) explains 15 percent of the increase in within-group earnings inequality. While not all economists share this view, it is prudent to control for these changes and for how they might produce different effects for immigrant and native wages. Along a similar line of reasoning, a continuous variable is added for the number of own children still in the house (**KID**).

Another component of the vector of worker characteristics controls for different rates of return to having Hispanic ethnicity (**HISP**). The relevance of this control variable has already been mentioned in the form of rising Mexican and Latino percentages of the new generations of immigrants since the 1970's. Since studies continue to show that racial discrimination maintains a real presence in the US labor market, controlling for the largest ethnic share of both immigrant groups in the samples is appropriate for the analysis. The dummy variable identifies workers of Mexican, Puerto Rican, Cuban or other Hispanic ethnicities.

The last variable in the vector of worker characteristics controls for different rates of return to employment in the service sector. Bluestone et al (1988) note for the early 1980's that the low-wage share of service sector employment is nearly 22 percent compared with [only] 12.4 percent in manufac-

turing and an overall 17.2 percent among all YRFT workers. The dummy variable (**SSEC**) used here indicates those working in the service sector instead of the goods sector. It is expected that working in services instead of goods production will have negative effects on the earnings of both groups in both census years. The industry groups for each sector are shown in Appendix A. Table 3 shows the predicted signs for all variables in the earnings functions. The main focus will be on the coefficients for the education variables. It is expected that natives received higher rates of return to all three levels of education in both years of observation; and that both groups received higher rates of return to all three levels of education in 1990, with the largest increase occurring for the rates of return to a college degree. However, the magnitude of these rate-of-return differences for immigrant and native education will offer incite into what determines them.

IV. REGRESSION RESULTS

Estimating the earnings functions for immigrants and natives using OLS regression in both years of observation generates four sets of results as shown in Table 4.

The table shows the coefficients corresponding to the variables used with their T-statistics in parentheses. Using the natural logarithm of wage and salary income allows us to interpret the coefficients as the percentage change in earnings in response to a one unit increase in the independent variable. This means that each coefficient represents the rate of return in

**TABLE 3
Predicted Signs**

Variables	1980		1990	
	Immigrants Dependent	Natives Dependent	Immigrants Dependent	Natives Dependent
Ln(Wi)				
CEduc	+	+	+	+
SCEduc	+	+	+	+
HSEduc	+	+	+	+
USExp	+	+	+	+
USExp^2	--	--	--	--
EngW	--	--	--	--
EngNW	--	--	--	--
EngNO	--	--	--	--
MS	+	+	+	+
KID	+	+	+	+
HISP	--	--	--	--
SSEC	--	--	--	--
AgeMig	--		--	

that year to an increase in a particular variable or

TABLE 4
Regression Results

	1980		1990	
	Immigrants	Natives	Immigrants	Natives
Constant	8.536 (325.878)**	8.351 (1371.036)**	9.005 (460.481)**	8.720 (1388.574)**
CEduc	.519 (35.618)**	.729 (171.623)**	.725 (60.579)**	.939 (202.718)**
SCEduc	.242 (15.095)**	.448 (103.574)**	.358 (30.213)**	.551 (122.470)**
HSEduc	.134 (9.706)**	.309 (84.343)**	.224 (20.512)**	.344 (80.407)**
USExp	.0755 (30.878)**	.0538 (115.188)**	.0519 (36.708)**	.0521 (109.362)**
USExp2	-1.76E-3 (-23.501)**	-9.23E-4 (-101.346)**	-8.96E-4 (-25.597)**	-9.22E-4 (-96.801)**
EngW	-.126 (-10.063)**	-.125 (-10.368)**	-.130 (-13.549)**	-.195 (-14.237)**
EngNW	-.303 (-18.109)**	-.196 (-9.673)**	-.263 (-21.812)**	-.136 (-6.460)**
EngNO	-.391 (-15.927)**	-.423 (-7.367)**	-.403 (-21.962)**	-.220 (2.674)*
MS	.281 (21.730)**	.353 (102.037)**	.305 (32.429)**	.355 (111.144)**
KID	.0148 (3.987)**	.0176 (15.466)**	.00540 (1.724)*	.020 (16.180)**
HISP	-.128 (-10.827)**	-.103 (-13.909)**	-.161 (-18.595)**	-.0938 (-13.636)**
SSEC	-.131 (-13.090)**	-.0933 (-35.371)**	-.0964 (-12.509)**	-.0793 (-30.724)**
AgeMig	.00243 (4.714)**	--	.00162 (4.091)**	--
Adjusted R²	.188	.145	.249	.178
Sample Size	30,629	402,650	57,733	460,164

**Results are significant beyond the .001 level.

*Results are significant beyond the .01 level.

characteristic such as an individual's level of education, or years of work experience, etc.

The adjusted R-squared values for the immigrant and native regressions are .188 and .145 respectively in 1980, and .249 and .178 respectively in 1990. Of the control variables used – all of which were significant and showing the predicted signs, with the exception of **AgeMig** – the most interesting results came from Hispanic ethnicity (**HISP**). For having Hispanic ethnicity immigrants were hurt more than natives in both years of observation. In 1980 immigrants earned 12.8% less for having Hispanic ethnicity while Hispanic natives earned only 10.3% less. While the situation grew worse for Hispanic immigrants in 1990 – who earned 16.1% less than non-Hispanic immigrants – it improved somewhat for Hispanic natives, who only suffered earnings losses of (roughly) 9.4%.

I put forward two explanations for these results; both of which derive from the changes in the national origins mix that followed the amendments made to US immigration policy in 1965. First, given that the Hispanic portion of incoming immigrants experienced growth between 1980 and 1990, it is likely that by increasing competition with native workers the larger number of Hispanic immigrants increased the incidence of discrimination in the US labor market. Such discrimination would translate empirically as greater immigrant losses to Hispanic ethnicity. Secondly, Borjas (1985, 1995, 1999) has asserted that the economic conditions enticing indi-

viduals to leave the less-developed source countries that have recently dominated the national origins mix have given the new generations (after 1970) of immigrants lower quality (less-developed) educations relative to US standards. This effect would also translate empirically, in part, as lower immigrant rates of return to Hispanic ethnicity. However, since education is controlled for in the analysis, the Hispanic ethnicity variable does not filter out all

of these effects.

Regarding the first hypothesis, the results show that even after controlling for a number of worker characteristics and other human capital, immigrants received lower rates of return to a college degree, to some college experience and to 12 years of completed education in both years of observation. What is important to keep in mind is the method used to determine the percentage changes in rates of return to these three levels of education. The omitted education group used for reference in the analysis consisted of workers with less than 12 years of education. Therefore, any percentage change in the rates of return to the three education levels must also account for changes in the group's rate of return to less than 12 years of education. That being said, in 1980 college-educated immigrants earned only 52% more than immigrants that didn't finish 12 years of school, while college-educated natives earned 73% more than natives with less than 12 years. Natives with some college experience also earned 45% more than those with less than 12 years of education, and those that at least completed 12 years of education earned 31% more than those who did not. Immigrants, on the other hand, earned only 24% more for one to three years of college experience relative to their reference group, and a very low 13.4% more for finishing just 12 years of school.

As hypothesized, these trends carried over to 1990 at all three levels of education. The most notable case is the rate of return to a college degree,

where natives earned an additional 94% and immigrants earned an additional 72.5%. From these results it is clear that while natives had higher average levels of education than immigrants over the 1980's, they also received significantly higher rates of return to the same levels of education. The margin of difference between these rates of return makes this point difficult to argue with. What remains open to speculation is what causes such differences at all three levels of education over the ten-year period of observation.

The most likely theories for why immigrant rates of return to education are lower than native returns are also the two most popular explanations given for the relatively lower wages received by immigrants since the late 1960's. They focus on the growing problems of English language deficiency and the foreign attainment of a relatively lower-quality education than would be received in the US. The research design's use of control measures for English skills rules out language deficiency as a possible cause. The language deficiency variables for immigrants are all highly significant, and their signs follow the predictions. Also their magnitudes follow a logical order in both years of observation, and immigrant rates of return to education still trail behind natives' by a significant amount.

The theory that immigrants raised in some less-developed countries receive education of a relatively lower quality is another explanation for relatively lower immigrant rates of return to education. However, it is unlikely that this factor exerts enough explanatory power to explain the entire margin of difference between immigrant and native rates of return at all three levels of education. The main reason for this can be taken directly from our results. Given that so many of the immigrants arriving after 1970 were Hispanic (in our data samples, 33.5% in 1980 and 43.6% in 1990), it is expected that the control variable used for Hispanic ethnicity filtered out a portion of the negative wage effects resulting from the attainment of an education in a less-developed country. This can be seen in the greater disparity between immigrant and native rates of return to Hispanic ethnicity in 1990 than in 1980. Therefore, while the quality differences in education between the US and many of its less-developed source countries explain a portion of the disparity seen in immigrant and native rates of return to education, they cannot explain all of the disparity.

Our second hypothesis suggested that rate-of-return growth between 1980 and 1990 was positive for all three levels of education, but that it was greatest for those with a college degree. This hypothesis was intended to separate the differences in rates of return to education strictly by level of education as opposed to our immigrant-native framework for comparison. This was done with the hope that our results for growth in the returns to education would show trends that might lend other explanations for observed differences in the returns to education. As expected, the results show that in 1990 both groups experienced higher rates of return to all three levels of education than in 1980. The most modest growth occurred for the completion of 12 years of education, where rates of return grew 9% for immigrants and only 3.5% for natives.

Surprisingly, immigrants also experienced 11.6% greater returns to some college experience while native returns grew by 10.3%. The result that immigrant rates of return outgrew native returns to both of these education levels was unexpected. Considering the increase in average native education levels over the 1980's and the simultaneous influx of immigrants originating in less-developed countries, one would expect native returns to outgrow immigrant returns for both levels of education. The most likely explanation for why this did not occur derives from changes in the rate of return that each reference (omitted) group experienced for having less than 12 years of education.

Since our estimates of the returns to 12 years of education, some college experience, and a college degree are measured relative to the omitted group, if the immigrant rate of return to the completion of less than 12 years of education declined over the 1980's, our results would show inflated growth in their returns to the other three levels of education. Therefore, it is likely that these larger immigrant growth rates in the returns to some college experience and to the completion of 12 year of education are partly explained by the greater difficulty had by less-educated immigrants in the US labor market over the 1980's.

As the theoretical framework established – and as the literature suggests – the largest rate-of-return increase occurred for workers with a college degree. To this education level immigrants and natives experienced 20.6% and 21% higher rates of return respectively in 1990 than in 1980. Before

exploring changes in the supply of college-educated labor, it is worth noticing two things about these growth rates in immigrant and native returns to a college degree; both in their relation to each other and in their relation to observed growth in the rates of return to some college experience and to the completion of 12 years of education.

First of all, the similarity between them is striking. Either such regularity is a coincidence, or another causal force exerted similar power over both immigrant and native rates of return to a college degree over the 1980's. Secondly, the large margin by which these rates of return to a college degree outgrew the rates of return to the respective lower levels of education for immigrants and natives supports the observation made in much of the literature (Levy et al 1992, Bartel et al 1987, Berman et al 1994) that the returns to higher skills (college education) increased more than did the returns to lower skills (high school education) over the 1980's.

Now, concerning changes in the supply of college-educated labor, Table 1 (p.7) shows that the two largest age groups (25-34 and 35-44) in the college-educated, male labor force experienced increases of 32% and a staggering 102% between 1979 and 1987 compared to the previous decade. As was mentioned in section II, the simultaneous increase in the employment shares and wage rates of a group of workers suggests a growing demand for the labor provided by that particular group. Therefore, it is possible that the rate-of-return growth for a college education experienced by natives and immigrants is at least partially caused by increased relative demand for skilled labor over the 1980's.

In sum, while the regression results may have turned up more questions than answers regarding what drives the observed differences in immigrant and native rates of return to education, they do give us a few strong conclusions. The confirmation of our first hypothesis lends support to two major claims. First, and without question, immigrant workers received much lower rates of return to all three levels of education relative to natives in 1980 and 1990. Secondly, the measures of control taken in the research design and the nature of the results suggest that neither English language deficiency nor "less-developed" education can explain all of the lower rates of return experienced by immigrants. The results verifying our second hypothesis accommodate the possibility that at least part of the observed rate-

of-return growth for a college degree experienced by both groups in the 1980's resulted from the increased demand for skilled labor.

V. CONCLUDING REMARKS

Our results have shown that immigrants experienced much lower returns to the same levels of education than natives. Since the interpretation of these rates of return is where the real argument lies, we appealed to traditional explanations that fix the analytical focus on the skills and characteristics that immigrants bring to the US labor market. While these accounts are a vital assessment of immigrant labor – one that has revealed determinants of poor immigrant performance such as English language deficiency and education levels of relatively lower quality and quantity – a fuller analysis must also take stock of the labor market conditions in which immigrants are being rewarded for their skills. We were able to show that the rate of return to a college degree for each group could have been driven up over the ten year period by greater labor demand for skills in spite of tremendous concurrent growth in the supply of college-educated workers. This possibility suggests that labor market conditions have a significant effect on the rewards received by immigrants and natives for certain levels of education.

A direct implication of the rate-of-return analysis in this paper is that traditional explanations for the poor labor market performance of immigrants cannot account for all of these observed differences in education reward structures. Further research should focus on the relative quality of education received in the US and in some of its less-developed source countries. Some form of estimate of differential education quality would allow the measurement of the amount of responsibility that a foreign education of lower "relative quality" should assume for the lower relative rates of return that immigrants experienced at all levels of education. Furthermore, given that a lower quality education characterized the human capital stock of many incoming immigrants after the 1970's, it is an implication of this paper that future amendments to immigration policy should consider either shifting admittance criteria more towards educational attainment and work-related skills or implementing post-arrival education programs targeted at immigrants.

APPENDIX A

Industry Groups by Nature of Production

Goods Sector

Agriculture, Forestry and Fishing
Construction and Mining
Manufacturing (durable and nondurable goods)

Service Sector

Transportation, Communication and other Utilities
Wholesale and Retail Trade
Finance, Insurance and Real Estate
Business and Repair Services
Personal Services
Entertainment and Recreation Services
(10) Professional and Related Services
(11) Public Administration

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