Addressing the Low Returns to Education of African Born Immigrants in the United States

Jongsung Kim
E-mail: jkim@bryant.edu

Francis Kemegue
E-mail: fkemegue@bryant.edu

Department of Economics
Bryant University
1150 Douglas Pike
Smithfield, Rhode Island 02917

ABSTRACT

This paper uses 2000 Census 5 percent Public Use Microdata Sample to investigate the relative earning pattern of immigrants from African countries, and explores the relevance of existing explanations of the low returns to education. The study uses the Extreme Bound Analysis to check the robustness of the variables of interests. The empirical findings from the conventional earnings regression conform to the theoretical expectations. However, not all the variables of interests are robust in Extreme Bound Analysis. This suggests that conventional specifications may not encompass all necessary information. Future study may explicitly controls for more detailed country-specific characteristics of the immigrant-sending countries.

May 15, 2007

Keywords: African immigrants in the United States, returns to education, discrimination

JEL Code: J61 – Immigrant Workers; N37 – Labor/Africa; J15 Economics of Minorities; J71 – Discrimination

I. Introduction

The immigration reform of 1965 opened the gates of the United States to many immigrants from less developed countries, prompting an impressive immigration literature that evaluates the economic consequences of immigration on host countries. This literature follows two directions: on the one hand, it evaluates the social and fiscal implications of the increased influx of immigrants, yielding mixed results. It initially suggests that the overall effect of immigration on the natives is relatively insignificant (Borjas, 1983; Borjas, 1985; Butcher and Card, 1990), but substantive findings add that immigration reduces the job market prospect of low skilled natives (Topel, 1994; Camarota, 1998; Partrige et al., 1996).

On the other hand, this literature evaluates the quality of immigrants entering the host country's labor market, finding that immigrants are of better quality, at least when considering their returns and their assimilation to the U.S. labor market (Chiswick, 1979; Borjas, 1987). The former findings have generally been explained by the pressure of the quantity of low skilled immigrants on limited opportunities in the host country, whereas the latter findings are explained by the endogeneity of immigrants' motivation, or the endogeneity of their labor force participation (Borjas, 1987). Nonetheless, most studies that have included African immigrants have consistently shown Africans to earn lower returns to education than other immigrants with the same measured skills (Kalmijn, 1996; Model and Ladipo, 1996; Dodoo, 1991).

Various U.S. census data confirm this consideration as they display that on average African immigrants are better educated, but they have lower returns to education when compared to other immigrants, and higher income when compared to natives.

Given the endogeneity of immigrants participation in the U.S. labor market, this startling contrast between human capital characteristics and labor market performance of African immigrants begs for a better understanding of the experience of African immigrants in the U.S. labor market.

The objective of this paper is to encompass all theoretical features of negative returns to education to African-born immigrants using a single data set, and to check the robustness of the results to changes in the conditioning information set.

II. Literature Survey

A very limited number of studies are concerned with the experience of African immigrants in the U.S. labor market. Most studies are either on the entire immigrant population or on the black population, and consider African immigrants to be just part of the larger group (Butcher, 1994; Dodoo, 1991; Kalmijn, 1996; Model, 1991; Model and Ladipo, 1996). Recent studies report three common findings.

The first finding is the idea of immigrant superiority whereby black immigrants earn higher returns compared to native blacks of same skill level (Sowell, 1978; Harisson, 1992; Waters, 1994; Kalmijn, 1996; Model and Ladipo, 1996). Three reasons are often used to explain this situation; (i) there are factors in the immigrant-sending countries that push immigrants to be highly motivated (Sowell, 1978; Chiswick, 1979; Model, 1991; Butcher, 1994; Kalmijn, 1996), (ii) there is the endogenous process that lead immigration to select people with high human capital characteristics (Borjas, 1994); and (iii) there is a preference of employers for immigrants, Caribbean, for example, when they hire worker (Foner, 1985; Waters, 1994). Provided that these explanations are

accurate, they lead to higher expected market outcomes for immigrants because of higher (perceived or intrinsic) motives.

The second finding restricts the first conclusion as it shows that black immigrants earn on average lower returns when compared to other immigrants (Chiswick, 1979; Dodoo, 1991; Model and Ladipo, 1996; Model, 1997). Two reasons are often advanced: (i) blacks tend to be from a lower social background and for that matter take more time and more education to bridge the racial gap (Wilson, 1980; Farley, 1984; Smith and Welch, 1989), and (ii) racial gap may actually be increasing with education (Dodoo and Taki, 2002; Wilson, 1980; Farley, 1984; Burstein, 1985; Wilson, 1989; Cancio and Maune, 1996). The third finding is that, because of social and cultural constructions African immigrants, specifically, sit at the lower step of the ranking of ethnic groups as compared to other immigrants with the same measured skill (Model and Ladipo, 1996; Dodoo, 1997; Dodoo and Taki, 2002).

So what explains the low returns to African Immigrants?

Although the current literature observes but does not specifically address the puzzle of African immigrants' returns, it does provide, however, a framework for exploring the contrast between the acquisition of human capital, and the return to African immigrants. The current literature, which is of sociological orientation for the most part, considers the dominant answer to the situation of African immigrants to be discrimination (Model and Ladipo, 1996; Dodoo, 1997; Dodoo and Taki, 2002).

This literature describes racially segmented markets where the entry of black immigrants causes the returns to non-mover black natives to be lower, and keeps black

immigrant wages lower when compared to other immigrants with comparable skills. More precisely, theoretical explanations of income variations across immigrants point to supply factors such as cultural and economic disparities between countries of origin, to demand factors such as queuing of the immigrants in the labor market, or an outright racial discrimination, and to the non-linear path of equilibrium wage under increasing level of education.

The cultural difference perspective contends that motivation, by opposition to biological factors, explains observed differences in earnings attainment between immigrants participating in the labor market (Sowell, 1978). Higher earning appears to reflect a quality premium, due to cultural differences between countries exemplified by the difference in education and labor market attainment between the British Caribbean and immigrants from other parts of the Caribbean (Butcher, 1994). Earnings differences are, therefore, attributed to social and colonial preparation (Glazer and Moynihan, 1963; Sowell, 1978; Butcher, 1994). One of the incidences of the preparation or cultural argument is that it undermines the explanatory power of biological arguments that regarded differences in social attainment between blacks and whites as racial ordering (Sowell, 1978).

If prior preparation matters to the labor market outcomes of educated Africans, then two conjectures may be valid. First, it may suggest that colonial or cultural constructions lead Africans to specialize in areas of studies that are less valuable in the U.S. labor market, causing educated Africans with non transferable skills to increase the labor supply in the low paying segment of the market. There are only anecdotic

references to this type of situation in the literature, suggesting why Africans logically earn a low return to their education.

The second conjecture is that those Africans who settle in the United States are not as endowed in labor market characteristics as the Africans who choose to stay in the country of origin, in other words, immigration negatively select the quality of African immigrants. This hypothesis parallels Sowell's claim that, former colonies residents in Britain were of lower quality "because not always the best and the brightest were encouraged to migrate (Sowell, 1978)." It also opposes the current concern of the "brain drain" crisis that contributes to lower economic growth rates in African countries. At any rate, actual comparison in quality between immigrants and natives is the main concern of the Borjas general theory.

Borjas theory suggests that immigrants differ in quality not only because of specific cultural characteristics of their country of origin, but also because of how the incentive to migrate is coupled with the economic conditions in the country of origin. In substance, immigration attracts better quality immigrants from countries with relatively equal distribution, where the incentive to migrate is less motivated by economic hardship, than from countries with high income disparity, where economic hardship, affecting probably lower quality workers, forces them to migrate. Immigrants will therefore differ in quality in the host country according to their country of origin, and migrants from the same country of origin may also differ in quality according to their destinations (Borjas, 1990; Borjas and Trejo, 1991). It follows that the relatively low returns to African immigrants can be explained by the high-income disparity in African nations, making Africans who migrate to the United States to be of lower quality compared with others

who decide to stay. In summary immigration decreases the supply of low quality workers in the source country and increase the supply of such quality workers in the United States.

To our knowledge, no study has discussed the quality or other special conditions of African immigrants, even though it would be a plausible explanation to why Africans would accept lower returns than other immigrants would. However, such analysis would be incomplete if it did not include the perception of the agents in the host country, as they set their hiring preferences. Such demand-led concerns in the host country are studied in the queuing theory and the racial discrimination theory.

The queuing theory suggests an approach of the labor market according to which the process by which immigrants enter the labor market may be stochastic, but the ability to find a well paying job may follow a non-stochastic process guided by demand-led preferences or ordering of immigrants by employers. This view contends that differences in returns to education among immigrants can be explained by the ordering characteristics being correlated with race, or with the country of origin.

The low returns to African immigrants (U.S., U.K.), therefore, reflects employers' perception of the low productive capacity of Africans leading to a relatively low and inelastic demand for African immigrant's labor. This view is sometimes considered to be a perpetuation of "social class differences that affect access to human capital and high paying jobs" and "race based differential reward to human capital" (Wilson, 1980;1989; Farley, 1984; Cancio and Maume, 1996). Queuing imperfectly explain income variability across immigrants of the same ethnic group, and the non perpetuation of initial rankings of second generation Americans.

Outright racial discrimination assumes that employers' racial preferences are permanent. The theory builds on two weaknesses of prior explanations of the lower returns to Africans on at least two accounts (i) controlling for other human capital characteristics, Africans educated in the U.S. earn lower returns than other equally educated immigrants (Butcher, 1994; Dodoo, 1997). (ii) among African immigrants, white Africans earn more than black Africans (Dodoo and Taki, 2002). The view concludes that discrimination on the market permanently keep African returns to be lower.

The path of the equilibrium wage changes in a non-linear fashion as education increases. This supposes that compared to other immigrants, African immigrants earn relatively comparable returns at jobs requiring lower skills and education but as their education increases, their wages increase at a decreasing rate. For this view, it matters how education is captured (years of schooling or degree).

Most analyses point to that U.S. education increases the earnings potential of most Africans at low levels, but earnings of Africans on average have been lower at higher levels of education. The question is whether returns to African immigrants are more non-linear, and whether the type of education received by Africans place them on a lower intercept compared with other immigrants because such education, especially when received outside the United States, may be non transferable.

Using the 2000 U.S. Census PUMS data, this paper investigates the roles of variables that affect the returns to education of African immigrants and compare them

with the returns to education of native black workers. We also perform the extreme bound analysis (EBA) for sensitivity analysis.[1]

III. Data Description and Sample Statistics

This paper uses the 2000 U.S. Census 5% Public Use Microdata Sample (PUMS). Analysis of racial-ethnic minority requires a large number of observations with sufficiently detailed information on human capital and labor market characteristics of sample. No other known data set includes as many individual observations from African countries as the Census PUMS. Due to the requirement of a large number of observations for accurate estimates, much research dealing with racial-ethnic minorities have used the Census PUMS.[2]

To focus on the workers with a strong attachment to the labor force, the sample includes civilian workers who reported working and reported earnings in the year prior to the Census, who were not residing in group quarters and who were not enrolling in school. Workers included in the sample are between 25 and 65 years old, since the workers who are younger than 25 may not have completed schooling and for workers who are older than 65, there is a risk that nonrandom mortality would bias the sample of older workers in favor of the more healthy.

Using the Census information, an hourly wage rate was computed by dividing the yearly earnings (salary and work income) by the product of the weeks worked a year and the hours worked a week. To minimize potential bias from the outlier, the top and

---

[1] We use the STATA module "**eba**" for the Extreme Bound Analysis.
[2] Borjas (1987) set a sample validation criterion of 80 observations for African immigrants, and Egypt was the only country that met the number of observation criterion. We do not impose such restrictions.

bottom one percent of the hourly wage were excluded.[3] Observations with missing values of hourly wage were also excluded. To define natives and immigrants, "Place of Birth" variable in the Census PUMS was used. A black native is defined as an individual who was born in the United States and identifies herself as black in the self-reported Census race variable, and an African immigrant is defined as an individual who was born in African countries. An African immigrant who identified herself as black will be referred to as "black immigrant," and an African immigrant who identified herself as white will be referred to as "white immigrant."

Sample characteristics

Table 1 lists the characteristics of the sample that satisfies the sample selection criteria. The list of immigrant sending African countries is in table 2. Table 1 shows that both male and female immigrant workers are slightly younger than comparable native workers (40.14 vs. 41.09 years for male and 39.18 vs. 40.81 years for female). Native-born workers are less likely to be married. The gap is conspicuous for female worker (61.8 percent for immigrant vs. 38.9 percent for native-born workers). The low marriage rate of native female black workers may be indicative of family dissolution, or potential difficulties in finding suitable mates.

African immigrants are relatively new immigrants to the United States. Forty two (Forty seven) percent of male (female) white immigrants came to the United States after 1990, and the corresponding numbers for black immigrants are 31 percent for male and 24 percent for female.

[3] Estimation results are almost identical with the inclusion of top and bottom one percent of the hourly wage.

Immigrant workers are better educated, and earn more than native-born workers. One notable pattern of the educational attainment is the immigrant workers' much higher representation in the postgraduate degrees. For all three postgraduate degree categories (Master's degree, Professional degree[4], and Doctorate degree), immigrants are substantially more represented than the native-born workers. For example, while 5.6 percent (1.6 percent) of the immigrant male (female) workers hold Doctorate degree, the corresponding number for native-born workers are only 0.5 percent (0.4 percent). Table 3 lists the percentage of medical related occupations and lawyers that are usually regarded as highly professional occupations.

Approximately 7.4 (10.1) percent of male (female) immigrant workers did not complete high school, whereas comparable numbers for native-born workers are much higher at 17.8 (13.1) percent for male (female) workers. Table 1 also shows a higher share of immigrants, for both male and female, in Professional occupation and Managerial occupation categories. The higher educational attainment of foreign-born workers is consistent with this pattern, since occupations in Professional and Managerial categories are known to require occupation-specific human capital that are usually acquired in school. The lower educational attainment of the native-born workers is also consistent with the higher representation of the native-born workers in Operative occupation categories.

While the majority of native workers reside in South of the United States, the same pattern was not found for immigrant workers. The native workers' heavy concentration in the South appears to be a reason for their lower earnings.

---

[4] Examples of "Professional degree" are MD, DDS, DVM, and JD. MBA is included in graduate degree (Master's degree) (Census 2000 Summary File 3 Technical Documentation, SF3/15(RV), March 2005).

IV. Data analysis with regression

A standard earnings function was regressed to investigate the patterns of earnings of African immigrants.

$$\ln W_{ij} = \alpha_j + \beta_j \mathbf{X}_{ij} + \varepsilon_{ij}$$

where W_{ij} is the hourly wage of workers i in the group j (based on nativity and sex). α_j and β_j are the intercept and vector of coefficients to be estimated. $\mathbf{X}_{ij}$ is the vector of explanatory variables about group origin, human capital, educational attainment, labor market experience, English language proficiency, location of residence, marital status, and occupational categories. ε_{ij} is the standard error term. Due to the possibility of the presence of heteroscedasticity in the sample with a large number of observations, the earnings function was regressed with an option of robust standard errors. Variables included in the vector of explanatory variables $\mathbf{X}$ are listed in table 1 with their sample characteristics. Table 2 lists the rank of immigrant sending African countries.

<u>Regression results</u>

To asses the relative effects of the explanatory variables (listed in table 1) on hourly earnings of black natives and African immigrants, regression analysis is used. Table 3 and table 4 list estimated coefficients of 5 models for male sample and female sample respectively. Model 1 in column (1) in table 3 and table 4 presents the estimated coefficients of the binary variable representing immigrant status (baseline category is

native workers) and indicates that male (female) African immigrants outearn male (female) native blacks by 14.5 (9.7) percent in hourly wage. Model 2 in column (2) in table 3 and table 4 controls for periods of immigrations, reporting much higher estimated coefficients for the immigrant variable (0.442 vs. 0.145 for male and 0.241 vs. 0.097 for female). This much higher immigrant advantage suggests that recently-arrived cohorts receive substantially lower hourly wages in the U.S. labor market.

The lower hourly wages of recently-arrived immigrant workers are shown in the pattern of four estimated coefficients in the "Year of Immigration" category in column (2) in table 3 and table 4. The estimated coefficients decrease as the arrival period categories become more recent. Male (female) Immigrants who came to the United States between 1991 and 1999 earn 47.2 (27.3) percent less than the baseline group, immigrants who arrived before 1965 and native blacks of same sex.

Although the increasing pattern of negative values of the estimated coefficients of arrival period variables appear to suggest immigrants' assimilation in the U.S. labor market, one must be careful in invoking assimilation-related interpretation since the differences in quality across cohorts were not yet controlled for (Borjas, 1985; Dodoo, 1997). Because the Census PUMS data were cross-sectional, cohort effects may be involved.

In addition to the arrival period variables, Model 3 in column (3) controls for such human capital characteristics as years of education, job market experience and English language proficiency, and other variables that are known to affect earnings, such as marital status and location of residence. When these additional characteristics are controlled for, the substantial earnings advantage of immigrant workers of 44.2 percent in

column (2) became less than half as high at 18.0 percent for male in column (3) in table 3. Similar pattern was found for female sample in which earnings advantage of 24.1 percent in column (2) in table 4 became less than half as high at 2.0 percent in column (3). This implies that compared with the earnings of black natives, African immigrants' better human capital characteristics are compensated in the form of high earnings in the U.S. labor market (Dodoo, 1997).

As the college education become more important for socioeconomic success in the U.S. society, Model 4 in column (4) controls for a variable interacting immigrant status and college education, along with mover characteristics and occupation characteristics. The negative estimated coefficients [-.058 for male and -.108 for female in column (4) in table 3 and table 4] of the variable interacting immigrant status and college education indicate that college-educated African immigrants are not as much compensated as comparable black natives.[5]

This finding is consistent with the Chiswick (1979)'s finding that the partial effect of an additional year of schooling on earnings for immigrant workers in the United States is by 2.5 percent lower than that of native. Many reasons were proposed to explain this differential. An explanation for this pattern is the non-transferability of human capital. Human capital accumulated in the country of origin may not be as valuable as those acquired in the country of destination.

Model 4 in column (4) also includes a variable for mover characteristics. Using Census PUMS "Place of Birth" variable and "State of Residence" variable, a mover was

[5] A possible reason for this compensation differential against African immigrant is the possibility that college education of African immigrants were attained outside the United States. We did not pursue this issue further in this paper.

defined as an individual who lives in a state other than her state of birth. The estimated coefficient of "Mover" variable indicates that male (female) native movers earn 4.6 (5.7) percent higher hourly wages than comparable native non-movers and immigrants. This finding is consistent with the self-selection argument (Butcher, 1994) that movers are likely to be individuals who are more motivated, and as such more likely to succeed in the labor market.

Occupational categories are also included in Model 4 (Baseline group is laborer occupation category). The introduction of occupation increased the estimated coefficient of the dummy variable indicating immigrants in column (4) from column (3); 0.18 vs. 0.212 in table 3 for male sample and 0.020 vs. 0.083 in table 4 for female sample. This implies that immigrant workers are more likely to work in the lower-paying occupation groups

In the absence of occupation variables (Model 3), the returns to education was .059 (.077) for male (female) workers. In the presence of the occupation variables (Model 4), the returns to education decreased to .050 (.054) for male (female) workers. The consistent decrease of the returns to education after the occupational categories being controlled for, suggests that workers are compensated for their education in a way that workers with higher educational attainments are more likely to work in occupations that are associated with higher earnings. Dodoo and Takyi (2002) also found similar patterns and conclude that "returns to education manifest themselves through occupational placement." All estimated coefficients for occupational categories are positive and statistically significant against the baseline occupation category of "Laborer." Details for the occupational categories are presented in table 5.

Blackness and whiteness

To see the differences between black and white immigrants, we estimate earnings regressions using a binary dummy variable for immigrants' race. To see how the college education is differently rewarded across race in the U.S. labor market, we also added a binary dummy variable interacting race status of immigrants and college education. The empirical results are reported in the column (5) in table 3 for male sample and in table 4 for female sample.

In almost all cases, it was found that white Africans immigrants are treated better than black African immigrants. For male case, the white immigrants were found to earn 21.7 percent more than the native black workers, whereas black immigrant workers were found to earn 15.4 percent more than native black workers.

For female workers, white immigrant workers and black immigrant workers were found to earn 5.8 percent and 8.3 percent more than comparable native black workers. Negative values of the estimated coefficients of the dummy variables interacting race status of immigrants and college education indicate the lower returns to immigrant workers' college education. For black (white) immigrant male workers, those coefficients are -.084 and -.012 respectively, where the former estimate is statistically significant at 1 percent level and the latter not being statistically significant. This implies that the returns to college education is comparable between black native workers and white immigrant workers, but the returns to college education of black immigrant workers is 8.4 percent less than those of native black workers and immigrant white workers.

For black (white) immigrant female workers, the estimated coefficients for college education are -.047 and -.133 respectively, where the former estimate is statistically significant at 10 percent level and the latter being significant at 1 percent level. This also shows that returns to college education for black immigrant workers are much lower than those of white immigrant workers and native black workers.

Although it was not the objective of this study, it can be suggested that countries characteristics are at least partly responsible of the variability in earnings amongst Africans. Specifically, to the extent that white immigrants are from relatively wealthier countries, and black immigrants are from relatively poorer countries, the lower estimated coefficient of black immigrants' interaction variable for race and college education implies that the quality of college education may be related to the wealth of the country of origin.

Despite the lower returns to college education of African immigrants, one possible reason for African immigrants' higher education is due to the phenomenon of brain drain.[6] Table 6 reports the percentage shares of occupations that require professional training and are usually linked with high earnings. Table 6 shows that percentages of physician/surgeons are almost 10 (30) times greater for black immigrants (white immigrants) for black natives. The transferability of human capital in medical fields may explain why the shares of medical filed occupations are substantially higher than the share of legal occupation. Human capital acquired in medical training is easier to transfer from African countries to the United States, than other types of human capital,

[6] A brain drain is said to occur when a country becomes short of skills when people with such expertise emigrate. The UN Development Programme (UNDP) notes that in Africa, the loss of medical doctors has been the most striking. At least 60 per cent of doctors trained in Ghana during the 1980s have left the country (Mutume, 2003).

for example that of legal field. However, partial transferability is not incompatible with lower returns to education. Perfectly matched increase in labor supply may happen in one small segment of the labor market, or may just meet a relatively inelastic demand, causing wages to be lower as suggested by the queuing theory and the racial discrimination theory.

The estimated coefficients of "South" variable are significantly negative, suggesting that native-born workers' heavy concentration in South appears to be an important reason for their lower earnings. The finding also renders support to the argument that lower earnings of blacks is the result of inequality and discrimination that tend to magnify where there is a high concentration of non-whites. (Dodoo and Takyi, 2002).

A pattern of interests is the higher labor market returns to education for white immigrant workers than for black immigrant workers from African countries. This requires a further analysis of the possible explanations for why the returns to education for black immigrants are lower than those of white immigrants.

Butcher (1994) presents regression results for employment probabilities and hourly log earnings per week for the sample. To see the differences in employment probabilities and hourly wage between white immigrants and black immigrants, logit and OLS regressions were performed with binary dummy variables for these groups, and interaction variables of race and education are included.[7]

These two dependent variables show similar patterns with respect to the immigrant effects. In table 7, the estimated coefficients of immigrant dummy variables

[7] The standard errors of the logit models are adjusted by the White correction method to account for heteroskedasticity.

are positive, and the estimated coefficients of the variables interacting immigrant status with education are negative, indicating that returns to education are significantly lower for immigrant black men than for native black men. These results are consistent with Butcher's finding (1994 Table 2).

English language proficiency variable

English language proficiency is regarded as one of the most important human capital characteristics for immigrants to assimilate and succeed in the U.S. labor market. To see the impact of English proficiency on hourly earnings, three categories of English proficiency variables were used ("Only speak English or Speak English very well" is the baseline category). Surprisingly, more than half of the estimated coefficients of English proficiency variables in male regression are found to be statistically insignificant. What is more puzzling is the statistical insignificance of all estimated coefficients of English proficiency variables in the regression for female sample.[8]

Our conjecture is that immigrant workers tend to work in occupations where English proficiency is not very important. Although many occupations require English proficiency for successful performance, to the extent that immigrant workers work in ethnic enclave where English proficiency is less important, the lack of English proficiency may not affect earnings.

V. Extreme Bound Analysis

[8] Only one out of 9 estimated coefficients for female sample is statistically significant at 10 percent level. The other eight estimated coefficients are not statistically significant even at 10 percent level.

To ensure the robustness of the estimated coefficient of education variable, we investigate the sensitivity of the empirical findings to the changes in the number of explanatory variables, using a variant of the Extreme Bound Analysis (EBA) technique discussed in Levine and Renelt (1992). EBA checks that econometric inferences are not too much dependent upon the conditioning information set. The method consists of increasing the set of prior distributions with the objective of obtaining narrow bands of posterior distributions.

In an extreme bound test, one calculates the lower extreme bound as the lowest value, and the upper extreme bound as the largest value for all the possible regressions with the same number of parameters.

The extreme bound test for a variable *M* suggests that the variable *M* is not robust if the lower extreme bound ($\hat{\beta}_X - 2\sigma_X$) is negative and the upper extreme bound ($\hat{\beta}_X + 2\sigma_X$) is positive. This implies that as long as there is one regression for which the sign of the coefficient changes or not significant, then the variable is not robustly influential.

For the EBA analysis, we use the following specification (Levine and Renelt, 1992).

$$Y = \beta_M \mathbf{M} + \beta_I \mathbf{I} + \beta_Z \mathbf{Z} + \varepsilon$$

where Y is log of hourly wage, $\mathbf{M}$ is the variable of interest, $\mathbf{I}$ is a set variables always included in the regression, and $\mathbf{Z}$ is a subset of variables chosen from a set of potentially important explanatory variables of log of hourly wage.

<u>EBA results</u>

In the EBA analysis, the variables of interest, included in **M**, are four variables: two binary variables interacting immigration status and race (black and white) and two binary variables interacting college degree and race (black and white). They are "Imm * White," "Imm * Black," "Imm * White_College," and "Imm * Black_College."

When two variables were used in $\mathbf{Z}$, all four variables of interests are robust in male sample, but only one variable (Imm * White College) is robust in female sample. When three variables were used in $\mathbf{Z}$, three variables of interests (Imm * White, Imm * White_College and Imm * Black_College) are robust in male sample, but none of the variables of interests are robust in female sample. This suggests that when controlling for more variables (included as $\mathbf{Z}$ variables) some of the variables of interest become fragile. The situation seems to be worse in the female case than in the male case.

In summary, some of the partial correlations in the earning regressions seem robust. It appears that individual labor market characteristics explain the earning patterns of African immigrants. However, many of these partial correlation become fragile as more variables are controlled for. This casts a doubt on the complete validity of the specifications used in the earning regressions. One of the reasons of the lack of robustness in the variables of interests may be related to country-specific characteristics of immigrant-sending countries, which were not controlled for in this paper.

VI. Summary

The low returns to education to African immigrants is currently viewed as the consequence of existing discrimination in the U.S. labor market, where African immigrants operate in the low paying segment of the market, earning higher wages than

low skilled native blacks, but earning lower returns to their education when compared to other immigrants. This study investigates the various factors that affect African immigrants' returns and questions the used specification.

The study confirms the robustness of known results pertaining the the labor market experience of African immigrants. Two types of variables robustly explain the earnings of Africans: race and education. The study finds that African immigrants outearn native blacks but their wages are nonlinear in two ways: (i) recently arrived cohorts of African immigrants earn lower wages; (ii) black African immigrants earn lower returns to their education than white African immigrants.

Including occupational categories in the research lead to that, African immigrants are fully compensated when they find a job that is a good match to their qualification and skills. It suggests that education helps the earnings of Africans only when it is transferable. Otherwise educated Africans accept lower returns.

Such conclusions are compatible with a certain number of considerations: First, following the queuing theory, the labor market may be racially segmented and ceteris paribus an influx of African immigrants increase the supply of labor causing the equilibrium wage for blacks in general to decrease.

Second, the non statistical significance of the variables reflecting the set of skills useful in the labor market (language) and the limited transferability of knowledge brings additional questions regarding the location where education was acquired by the immigrant, and the exact set of professions that ultimately rewards the education of Africans. If the profession is in a relatively limited segment of the market, wages are equally expected to decrease in response to an increase in supply.

In summary, the objective of this paper was to encompass all theoretical features of the negative returns of education to Africa-born immigrants in a single data set. The results confirm existing theories and suggest that current literature could benefit from the introduction of new variables (country-specific variables) in the study of return to education of African-born immigrants.

There are other possible sources of variability in wages among African immigrants from different country of origin. The data suggest that there may be quantity effects related to a larger number of immigrants from richer (or white) African countries and quality effects associated with better quality immigrants from richer (white) countries as well. All these add to the segmented market and the non transferability of skills to beg for additional investigation of the lower returns to African immigrants.

.

References

Borjas, George. 1983. “The Measurement of Race and Gender Wage Differentials: Evidence from the Federal Sector.” Industrial and Labor Relations Review, October 1983, pp. 79-91.

Borjas, George. 1985. “Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants.” Journal of Labor Economics 3(Oct.), pp. 463-89.

Borjas, George. 1987. “Self-Selection and the Earnings of Immigrants.” American Economic Review 77, September 1987, pp. 531-553.

Borjas, George. 1990. Friends or Strangers. New York: Basic Books.

Borjas, George and Stephen J. Trejo, 1991 “Immigrant Participation in the Welfare System.” Industrial and Labor Relations Review, January 1991, pp. 195-211.

Borjas, George. 1994. “The Economics of Immigration.” Journal of Economic Literature 32, pp. 1667-717.

Butcher, Kristin. 1994 “Black Immigrants in the United States: A comparison with Native Blacks and Other Immigrants.” Industrial and Labor relations Review 47, pp. 265-284.

Butcher, Kristin and David Card. 1990 “Immigration and Wages: Evidence from the 1980's.” American Economic Review 81 (No.2). Papers and Proceedings of the Hundred and Third Annual Meeting of the American Economic Association. (May, 1991), pp. 292-296.

Burstein, Paul. 1985. Discrimination, Jobs, and politics. Chicago IL: University of Chicago Press.

Camarota, Steven A. 1998. “The Wages of Immigration: The Effect on the Low-Skilled Labor Market”. Washington, DC: Center for Immigration Studies.

Cancio, Silvia, David Evans and David Maune. 1996. “Reconsidering the Declining Significance of Race: Racial Differences in Early career Wages.” American Sociological Review 61, pp. 541-556.

Chiswick, Barry 1979. “The Economic Progress of Immigrants: Some Apparently Universal Patterns” In William Fellner, Ed., Contemporary Economic Problems. Washington DC: The American Enterprise Institute, pp. 357-399.

Dodoo, F. Nii-Amoo. 1997. “Assimilation Differences among Africans in America.” Social Forces 76(2), pp. 527-46.

Dodoo, F. Nii-Amoo 1991. "Earnings Differences among Blacks in America." Social Science Research 20, pp. 93-108.

Dodoo, F. Nii-Amoo, and Baffour K. Takyi. 2002. "Africans in the Diaspora: Black-White Earnings Differences among America's Africans. Ethnic and Racial Studies 25 (6). November 2002, pp. 913 – 941.

Dodoo, F. Nii-Amoo, and Nicola Kay Beisel. 2005. "Africa in American Sociology: Invisibility, Opportunity and Obligation." Social Forces 84 (1), September 2005, pp. 595-600.

Farley, Reynolds. 1984. Black and Whites: Narrowing the Gap. Cambridge MA: Harvard University Press.

Foner, Nancy. 1985. "Race and Color: Jamaican Migrants in London and New York City." International Migration Review 19, pp. 708-727.

Nathan, Glazer and Daniel Patrick Moynihan. 1963. Beyond the Melting Pot: The Negroes, Puerto Ricans, Jews, Italians, and Irish of New York City, Harvard University Press.

Kalminjn, Matthijs. 1996. "The Socio-Economic Assimilation of Caribbean American Blacks." Social Forces 74, pp. 911-930.

Levine, Ross and David Renelt. 1992. "A Sensitivity Analysis of Cross-Country Growth Regressions." American Economic Review 82(4), pp. 942-963.

Model, Suzanne. 1991. "Caribbean Immigrants: A Black Success Story." International Migration Review 25, pp. 248-276.

Model, Suzanne and David Ladipo. 996. "Context and Opportunity: Minorities in London and New York" Social forces 75, pp. 485-510.

Model, Suzanne. 1997. "An Occupational Tale of Two Cities: Minorities in London and New York." Demography 34, pp. 539-550.

Mutume, Gumisai. 2003 "Reversing Africa's Brain Drain" *Africa Recovery, Vol.17 #2* Available at http://www.un.org/ecosocdev/geninfo/afrec/vol17no2/172brain.htm (Accessed in February 22, 2008)

Partridge, Mark, Dan Rickman and William Levernier. 1996. "Trends in U.S. Income Inequality: Evidence from a Panel Data of States" Quarterly Review of Economics and Finance 36, pp. 17-37.

Smith, James and Finis Welch, F. 1989. “Black Economic Progress after Myrdal.” Journal of Economic Literature 27, pp. 519-564.

Sowell, Thomas. 1978. “Three Black Stories” in Essays and data on American Ethnic Groups. Thomas Sowell with Lynn D. Collins, eds. The Urban Institute, pp. 7-64

Topel, Robert H. 1994. "Regional Labor Markets and the Determinants of Wage Inequality." American Economic Review 84, pp. 17-22.

Waters, Mary. 1994. “Differing Perspectives on Racism: West Indians African Americans and Whites in the Workplace.” Paper Presented at the Annual American Sociological Association, Los Angeles California.

Wilson, Williams. 1980. The Declining Significance of Race: Blacks and Changing American Institutions. Chicago IL: University of Chicago Press.

Wilson, Williams. 1989. “The Declining Significance of Race Revisited But Not Revised” in Caste and Class Controversy on Race and poverty. C.Willie, ed. Dix Hills, NY: General Hall, Inc, pp. 22-36.

Table 1. 2000 Census Characteristics of Sample. SD in parentheses Age (25 - 65)

Variables	Male		Female	
	Foreign-born	Native	Foreign-born	Native
Age (years)	40.14 (8.95)	41.09 (10.00)	39.18 (8.96)	40.81 (9.88)
Married	.669 (.471)	.535 (.499)	.618 (.486)	.389 (.488)
Annual salary income ($)	39462 (32144)	31047 (21409)	27919 (21720)	25041 (17614)
Hourly wage	19.11 (13.18)	15.69 (10.11)	15.95 (10.91)	14.06 (9.52)
Hours worked a week	43.51 (11.68)	42.24 (10.18)	38.61 (10.92)	39.05 (9.36)
Weeks worked a year	47.21 (10.17)	47.22 (10.41)	45.50 (11.72)	46.27 (11.21)
Years of education	15.01 (3.18)	12.97 (2.38)	14.23 (3.11)	13.40 (2.25)
Less than High school	.074	.178	.101	.131
High school	.141	.345	.189	.293
Some college (no degree)	.175	.257	.197	.294
Associate degree	.077	.063	.104	.080
Bachelor's degree	.280	.112	.263	.135
Master's degree	.141	.033	.091	.054
Professional degree	.056	.008	.038	.009
Doctorate degree	.056	.005	.018	.004
Managerial*	.129	.073	.082	.081
Professional	.284	.101	.289	.177
Technician	.023	.017	.040	.034
Sales	.102	.054	.100	.071
Support	.084	.107	.189	.272
Craft	.065	.140	.006	.012
Operative	.143	.251	.061	.116
Service	.135	.162	.217	.217
Laborer	.026	.093	.008	.014
Northeast	.309	.126	.308	.132
Midwest	.129	.170	.112	.173
South	.367	.604	.377	.610
West	.195	.099	.203	.086
Non-metro	.006	.043	.006	.042

Mover	--	.36	--	.34
Number of observation	11,632	188,613	7,405	234,879

Source: 2000 Census 5 percent Public Use Microdata Sample.

*: Broadly defined occupational categories are based on 472 occupations used in the 2000 Census PUMS. More details for the occupational categories can be found at http://www.eeoc.gov/stats/census/occupational_data.html

Table 2: Rank of immigrant sending African countries

Black immigrants		Country code	# of black immigrant
1.	Nigeria	440	3017
2.	Not specified	462	1549
3.	Ghana	421	1419
4.	Ethiopia	416	1179
5.	Liberia	429	732
6.	Kenya	427	464
7.	Sierra Leone	447	444
8.	Eritrea	417	312
9.	Cameroon	407	254
10.	Somalia	448	248

White immigrants		Country code	# of white immigrant
1.	Egypt	414	1802
2.	South Africa	449	1135
3.	Not specified	462	811
4.	Morocco	436	666
5.	Algeria	400	188
6.	Zimbabwe	461	122
7.	Ethiopia	416	82
8.	Nigeria	440	67
9.	Kenya	427	67
10.	Sudan	451	34

Table 3: Estimated coefficients for hourly wage regression for Male sample

	(1)	(2)	(3)	(4)	(5)
Group origin					
Immigrants	.145**	.442**	.180**	.212**	
	(.007)	(.030)	(.028)	(.025)	
White immigrants					.217**
					(.028)
Black immigrants					.154**
					(.027)
Year of Immigration					
1991 – 2000		-.472**	-.293**	-.275**	-.230**
		(.032)	(.029)	(.026)	(.027)
1981 – 1990		-.251**	-.180**	-.166**	-.118**
		(.032)	(.030)	(.026)	(.027)
1971 – 1980		-.133**	-.156**	-.147**	-.106**
		(.033)	(.030)	(.027)	(.027)
1965 – 1970		-.017	-.071*	-.076*	-.058
		(.043)	(.039)	(.034)	(.034)
Human Capital					
Years of Education			.059**	.050**	.050**
			(.001)	(.007)	(.001)
College degree			.181**	.119**	.120**
			(.005)	(.005)	(.005)
Experience			.014**	.014**	.015**
			(.001)	(.001)	(.001)
Experience squared / 100			-.012**	-.014**	-.014**
			(.001)	(.001)	(.001)
English ability					
Well			-.052**	-.052**	-.047**
			(.008)	(.006)	(.006)
Not well			-.028	-.033 *	-.033*
			(.022)	(.017)	(.017)
None			.035	.005	.007
			(.091)	(.070)	(.071)
Non-metro residence					
Non-metro			-.130**	-.119**	-.119**
			(.007)	(.007)	(.007)

Continue to the next page

(** p < 0.01, * p < 0.05, + p < 0.1)

Table 3: Estimated coefficients for hourly wage regression for Male sample (continued from previous page)

	(1)	(2)	(3)	(4)	(5)
Marital status					
Married			.160**	.143**	.143**
			(.003)	(.003)	(.003)
South residence					
South			-.115**	-.113**	-.113**
			(.014)	(.003)	(.003)
Interaction					
Immigrant * College				-.058**	
				(.011)	
White immigrant * College					-.012
					(.020)
Black immigrant * College					-.084**
					(.012)
Mover					
Mover				.046	.046**
				(.003)	(.003)
Occupations					
Managerial				.317**	.316**
				(.006)	(.006)
Professional				.294**	.294**
				(.006)	(.006)
Technicians				.266*	.267**
				(.010)	(.010)
Sales				0.104*	.103**
				(.007	(.007)
Support				.118**	.118**
				(.006)	(.006)
Craft				.184**	.186**
				(.005)	(.005)
Operative				.143*	.143**
				(.005)	(.005)
Service				-.017**	-.016**
				(.005)	(.005)
Intercept	2.585**	2.586**	1.553**	1.537**	1.535**
	(.002)	(.002)	(.013)	(.011)	(.011)
R-squared	0.003	0.008	0.155	0.183	0.184
Number of observation	200,169	200,169	200,169	200,169	200,169

(** $p < 0.01$, * $p < 0.05$, + $p < 0.1$)

Table 4: Estimated coefficients for hourly wage regression for Female sample

	(1)	(2)	(3)	(4)	(5)
Group origin					
Immigrants	.097**	.241**	.020	.083**	
	(.008)	(.031)	(.030)	(.026)	
White immigrants					.058*
					(.029)
Black immigrants					.083**
					(.029)
Year of Immigration					
1991 – 2000		-.273**	-.085**	-.056*	-.052
		(.033)	(.033)	(.027)	(.029)
1981 – 1990		-.092**	-.006	.016	.021
		(.033)	(.033)	(.028)	(.030)
1971 – 1980		-.018	-.024	-.004	.0002
		(.035)	(.034)	(.029)	(.030)
1965 – 1970		-.014	-.062	-.037	-.037
		(.049)	(.046)	(.038)	(.038)
Human Capital					
Years of Education			.077**	.054**	.054**
			(.001)	(.008)	(.001)
College degree			.214**	.169**	.169**
			(.005)	(.004)	(.004)
Experience			.019**	.017**	.017**
			(.001)	(.004)	(.001)
Experience squared / 100			-.024**	-.023**	-.023**
			(.001)	(.001)	(.001)
English ability					
Well			-.010	-.010 +	-.010
			(.007)	(.006)	(.006)
Not well			.029	.011	.011
			(.018)	(.016)	(.016)
None			.112	.032	.031
			(.088)	(.068)	(.069)
Non-metro residence					
Non-metro			-.172**	-.138**	-.138
			(.007)	(.006)	(.006)

Continue to the next page

(** $p < 0.01$, * $p < 0.05$, + $p < 0.1$)

Table 4: Estimated coefficients for hourly wage regression for Female Sample (Continued from previous page)

	(1)	(2)	(3)	(4)	(5)
Marital status					
Married			.044**	.029**	.029**
			(.003)	(.002)	(.002)
South residence					
South			-.152**	-.140**	-.140**
			(.003)	(.002)	(.002)
Interaction					
Immigrant * College				-.108**	
				(.012)	
White immigrant * College					-.047+
					(.025)
Black immigrant * College					-.133**
					(.015)
Mover					
Mover				.057	.057**
				(.002)	(.002)
Occupations					
Managerial				.277**	.278**
				(.009)	(.009)
Professional				.233**	.233**
				(.008)	(.008)
Technicians				.166**	.166*
				(.010)	(.010)
Sales				-0.082**	-.082**
				(.008)	(.009)
Support				.094**	.094**
				(.008)	(.008)
Craft				.208**	.209**
				(.012)	(.012)
Operative				.017*	.017**
				(.008)	(.008)
Service				.131**	-.131**
				(.008)	(.008)
Intercept	2.473**	2.474**	1.215**	1.467**	1.467*
	(.001)	(.001)	(.014)	(.013)	(.013)
R-squared	0.001	0.002	0.1901	0.2339	0.2340
Number of observation	242,221	242,221	242,221	242,221	242,221

(** $p < 0.01$, * $p < 0.05$, + $p < 0.1$)

Variables

lnwage = log of hourly wage

imm = dummy variable for immigrants status: (0=native, 1=immigrant)
sex = dummy variable for gender (0=male, 1=female)

im1 = Dummy for arrivals after 1991
im2 = Dummy for arrivals between 1981 and 1990
im3 = Dummy for arrivals between 1971 and 1980
im4 = Dummy for arrivals between 1966 and 1970
im5 = Dummy for arrivals before 1965 and natives (Baseline)

education = years of educations

college = dummy variable for college degree (0=noncollege, 1=college degree)

exp = labor market experience (Age – Education – 6)
exp2 = (exp*exp) / 100

mary = marital status (0=not married, 1=married)

south=southern residence (0=all other area, 1=southern states)

Pweight = person weight

Table 5: Occupation categories

Census 2000 Special Equal Employment Opportunity (EEO) File Crosswalk from Census Codes and 2000 SOC Codes to the EEO Occupational Groups and the EEO-1 Job Categories. A list of codes of titles for the 14 EEO Occupational Groups and the 9 EEO-1 Job Categories for the Special EEO Tabulation are presented below.

EEO-1 Job Codes	EEO-1 Job Category Titles for the Special EEO File
1	Officials and Managers
2	Professionals
3	Technicians
4	Sales Workers
5	Administrative Support Workers
6	Craft Workers
7	Operatives
8	Laborers and Helpers
9	Service Workers

Each occupational category includes the following occupations in Census code. Detail of the codes can be found at http://www.eeoc.gov/stats/census/eeo-file-crosswalk.html (Accessed in February 15, 2008)

1. Officials and Managers: 1 – 60 70 – 73 81 – 95 601 660 931

2. Professionals: 62, 80, 100-153, 160-186, 200-211, 220-243, 255-280, 291-326, 434, 493

3. Technicians: 154-156, 190-196, 290, 330-354

4. Sales Workers: 470-492, 495-496

5. Administrative Support Workers: 214-215, 244-254, 500-593

6. Craft Workers: 620-625, 630-653, 670-674, 676-756, 762, 774, 803, 806, 816, 823, 825, 833, 835, 845, 850, 851, 855-862, 875, 876, 891, 951, 952.

7. Operatives: 770-773, 775-801, 804, 810, 814-815, 820-822, 824, 826-832, 834, 836-842, 846, 853-854, 863-874, 880-886, 892-894, 896-900, 912-930, 933, 935, 941, 942, 956, 960, 964, 965, 975

8. Laborers and Helpers: 421, 425, 435, 600, 605, 610, 612, 613, 626, 660, 675, 761, 936, 961-963, 972

9. Service Workers: 360-420, 422-424, 430-432, 440-465

Table 6: Shares and average earnings of professional occupations

Occupation	Black immigrant	White immigrant	Black Natives
Physician / Surgeon	$89,963 (1.63%)	$107,903 (3.44%)	$92,174 (0.17%)
Dentist	$73,614 (0.1%)	$83,145 (0.2%)	$84,410 (0.03%)
Pharmacist	$66,638 (0.7%)	$70,487 (0.7%)	$60,546 (0.06%)
Registered Nurse	$44,386 (4.7%)	$39,391 (1.7%)	$41,357 (1.4%)
Lawyers	$64,736 (0.3%)	$87,003 (0.6%)	$67,130 (0.2%)
Total sample observation	13,871	5,166	423,492

Table 7: Logit and OLS regressions for employment probability and hourly wage

Independent variable	Whether employed (Logit)		Log earnings	
	Male	Female	Male	Female
White Immigrant	1.133**	1.521**	.106**	.118**
	(.459)	(.445)	(.018)	(.021)
Non_White immigrant	.909**	1.372**	.080**	.086**
	(.232)	(.259)	(.014)	(.019)
Education	.131**	.187**	.009**	.011**
	(.003)	(.004)	(.001)	(.001)
White immigrant * Education	-.040	-.077**	-.006**	-.007**
	(.029)	(.029)	(.001)	(.001)
Non white * Education	-.042**	-.089**	-.005**	-.006**
	(.016)	(.019)	(.001)	(.001)
Constant	1.046**	.393**	.825**	.798**
	(.043)	(.047)	(.004)	(.003)
R squared	.016	.025	.008	.011
Number of observation	200,169	242,221	200,169	242,221