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Abstract

The aim of this paper is to provide some empirical evidence about black-white differentials in the distribution of income and wellbeing in three different countries: Brazil, US and South Africa. In all cases, people of African descent are in a variety of ways socially disadvantaged compared with the relatively more affluent whites. We investigate the extent of these gaps in comparative perspective, and analyze to what degree they can be explained by differences in the observed characteristics of races, such as where they live, the types of household they have, or their performance in the labor market. We undertake this analysis with the Oaxaca-Blinder approach at the means and with the DiNardo-Fortin-Lemieux approach at the entire distribution. Our results show how the factors underlying the racial divide vary across countries and income quantiles.

Keywords: racial inequalities, income distribution, United States, Brazil, South Africa.
JEL Classification: D31, D63, J15, J82, O15

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1. Introduction

Undoubtedly, in several countries in the world, a large and socially disadvantaged black population is found cohabitating with a more affluent group of whites. Historical reasons, however, and the magnitude of these socioeconomic gaps by race may differ in each context. Two relevant examples of this phenomenon are Brazil and the United States (US), countries with very different levels of economic and human development, (Brazil ranks 70th in the 2007/08 UN Human Development index and the US 12th) where significant and relatively deprived populations of African descent are mainly the result of European colonization that established a flourishing slave-based economy in the new world from the late 1500s until late 1800s, leaving a legacy of social discrimination that remains today. Both cases are characterized by extreme social inequalities which very often correlate with the racial divide, for which different positive discrimination initiatives in education or employment have been undertaken throughout the last decades in the US, and more recently in Brazil, even if they have increasingly been questioned in recent years. However, they also differ in a number of ways.

As a consequence of different colonization patterns (Portuguese in Brazil and mostly British in the US), the degree of miscegenation substantially differed in both countries, with populations of mixed race constituting the majority of African Brazilians but only a minority of African Americans in the US. Further, a more intense migration from Europe to the US resulted in blacks comprising only about 13 percent of the population in this country, compared to more than half of the population in Brazil. Blacks in the US used to be the largest minority in the country, but were outnumbered by Latinos in recent years. Regarding institutional divergences, racial segregation was legally sanctioned in the US for decades after slavery was abolished during the Civil

War, and was removed only as the result of the Civil Rights Movement in the 1960s. Brazil was the last country in the continent in officially abolishing slavery in 1888 but, unlike the US, did not enact any legal segregation system after the end of this institution.

Another outstanding example of a country with a significant black-white divide is South Africa where, unlike the previous examples, blacks are native to the region and represent the vast majority of the population. Despite that, they were minorized, first during the Dutch and British colonial times, and later during the apartheid system that institutionalized racial segregation until the 1990s, providing the country with the legacy of probably the most racially segregated social system in the world.

The aim of this paper is, first, to document these current racial inequalities in terms of equivalized household incomes in a comparative perspective, and then, to assess to what extent they are associated with the poor endowments of African descendants in each country in terms of their geographical location and demographic characteristics, such as the number of children or single mothers, their education attainment, or their labor market performance (characteristics effect). Alternatively, they might be the result of these characteristics making them less effective in providing earnings to their households (coefficients effect).

More specifically, we analyzed the magnitude of the average household income differential between races in each country and, after estimating household income regressions in a manner similar to the way typical Mincerian wage equations are estimated in labor economics, we decomposed this gap into characteristics and coefficients effects following the well known Oaxaca-Blinder approach. This decomposition was undertaken at two different levels: at the *aggregate* level, we estimated the joint contribution of all characteristics for each country respectively;

while at the *detailed* level we identified the individual contribution of each set of characteristics. We further analyzed how the racial differential by race in household incomes and its determinants vary across income quantiles of the distribution using a propensity-based reweighting DiNardo-Fortin-Lemieux approach. This latter approach also allowed us to identify the factors underlying the overrepresentation of blacks among the poor, as wells as their underrepresentation at middle and higher income levels. For that we analyzed the racial differential in poverty measures, as well as in densities along the income scale.

Using these two approaches we identified those factors which are more strongly associated with lower income among blacks as compared with whites in each country, then showing what policies are expected to have a higher impact on reducing racial inequalities, an issue which is of undoubtedly interest for policymakers and analysts interested in the racial divide. However, a deeper analysis of the real causes of the economic situation of blacks is beyond the scope of this paper. While we might identify a high correlation between lower levels of education attained by blacks and their relatively lower income, the actual reasons for such a racial gap in educational achievement cannot be addressed within this framework.

The structure of the paper is as follows. In the sections below, we first describe the data and main definitions, then review and compare the main differentials in income distributions among racial groups in the US, Brazil and South Africa. After this, we introduce the decomposition techniques and present our empirical results. The final section summarizes the main conclusions.

2. Data

In order to undertake the comparative analysis, we will use microdata from most representative household surveys in each country with national coverage of (mostly)

non-institutionalized population, providing information on main households and individual characteristics, including income and self-reported race/ethnic group. In the case of Brazil, we use the 2007 release of the National Household Survey (*Pesquisa Nacional por Amostra de Domicílios*, PNAD) that has been produced annually by the *Instituto Brasileiro de Geografia e Estatística* during the last quarter of each intercensus year since 1971 (quarterly between 1967 and 1970). Since 1987, the survey has asked respondents to self-categorize their skin color or race into one of five groups: *indígena* (indigenous), *branca* (white), *preta* (black), *amarela* (Asian), and *parda* (of mixed race). For most of the analysis we pooled blacks and people of mixed race into a single group (African Brazilians), since people of African descent might choose either of these categories due to the social stigma attached to blackness[1]. The data used for the analysis in the case of the US come from the *Current Population Survey* (CPS), Annual Social and Economic March Supplement, conducted by the U.S. Census Bureau. In this survey, people are asked to answer questions about their race and (Hispanic) ethnic origin. Since 2003, respondents have been allowed to report more than one race, making selections from six distinct race groups: white, black, American Indian or Alaskan Native, Asian, Native Hawaiin other Pacific Islander, and Other race. Further, this survey inquires whether or not the origin of each person is Spanish, Hispanic, or Latino. On the basis of these questions, we broke up the population into five non-overlapping groups: non-Hispanic whites (those who only declared this race), blacks or African Americans (identifying themselves as Black, either alone or in combination with other races, regardless of whether they identify or not as having Hispanic origin), non-black Hispanics or Latinos, Asian Americans (who further did not identify themselves as

[1] Telles (2002), among others, supports this view, arguing that the white versus non-white distinction is less ambiguous. After comparing the consistency in a specific survey between interviewer and respondent categorizations, he showed that racial classification between black and brown is more influenced by characteristics such as education, gender, age, and local racial composition.

being Black or Hispanic), and others, even if we will focus the main analysis on the first two groups. Finally, for the case of South Africa, we use the 2005/06 release of the *Income and Expenditure Survey* (IES) conducted by Statistics South Africa (Stats SA) between September 2005 and August 2006. The IES is designed chiefly to update the basket of goods and services required for the compilation of the Consumer Price Index. Although the IES targets consumption expenditure it also contains information on income and households characteristics and has been so far the most important source of information for studies of income inequality and poverty in South Africa, despite it provides more restricted information than CPS or PNAD. Respondents to this survey report their ethnic group choosing between white, black, colored (of mixed race), Indian or Asian, and other race. For the same reasons as in Brazil, in most of our analysis blacks and colored will be combined in the same group of African descents.

The definition of income used throughout this paper is households' annual disposable income measured in local currency (US dollars, South African Rands and Brazilian Reals), which has been equivalized by dividing the total amount for each household by the square root of the number of cohabiting members. In doing this, we take into account the existence of economies of scale derived from living together and sharing expenses in a standard and tractable way, allowing comparability across countries. Given that the Brazilian survey provides monthly income, this will be annualized multiplying the amount by twelve. For the sake of comparability among income distributions across countries, income will be also measured relative to the corresponding national median. Sample weights must be applied to the observations in all cases in order to obtain unbiased estimates of the population parameters.

3. Race and income distribution

Blacks in both Brazil and the US have lower income compared with whites, according to Table 1. The median equivalized household disposable income of blacks in the US, 20,192 USD, amounts to only 62 percent of the median for whites, which is 32,603 USD. This differential is even larger among African Brazilians: 5,535 $R (blacks), which is only 58 percent of 9,120 $R (whites). It is however in South Africa where racial inequality goes beyond any imaginable limit: blacks get about 7 percent of the average income of whites (R 9,630 compared with R 103,034). Colored people are significantly better off, but even in this case their median income is only 13 percent of that of whites.

The relative positions of Latinos and other minorities like Native Americans in the US do not substantially differ from that of blacks, with the exception of Asians, who constitute an affluent minority, even if there is a high degree of inequality within the group, whose wellbeing depends heavily on their skills and country of origin. The Asian minority in Brazil, primarily of Japanese descent, also appears to be more affluent than whites. Average income of people of Asian descent in South Africa is more than four times higher than income of Africans, but still 32 percent of that of whites.

Table 1. Population and annual equivalized household disposable income by race

Amounts in local currencies, respectively, USD, R$ and Rands
Bias-corrected Bootstraps standard errors in parenthesis (500 replications)

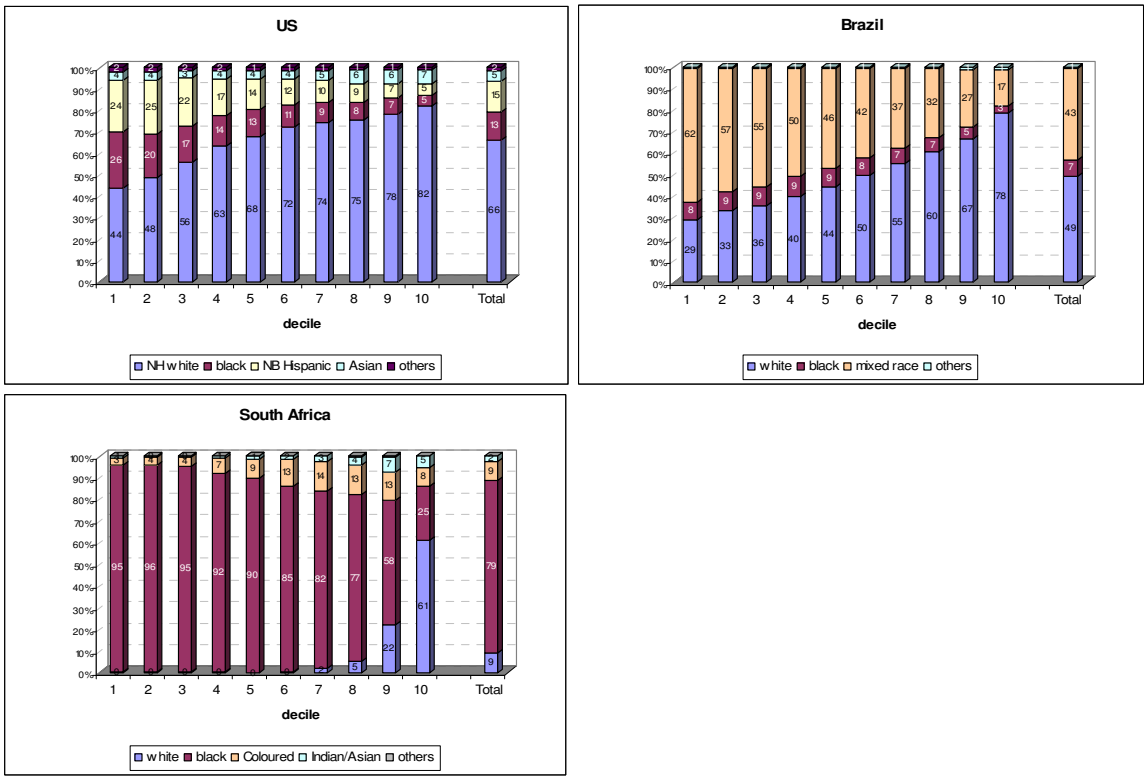
	Population (%)	Income				
		Mean		Median		Relative median whites=100
US						
White (non-Hispanic)	66.12	40,423	(119)	32,603	(71)	100
Black	13.16	25,877	(189)	20,192	(130)	61.9
Hispanic (non Black)	14.55	25,303	(142)	19,843	(94)	60.9
Asian	4.65	42,738	(445)	34,959	(481)	107.2
Others	1.53	29,927	(440)	23,789	(432)	73.0
All	100	36,257	(89)	28,748	(59)	88.2
Brazil						
White (*branco*)	45.16	15,243	(57)	9,120	(18)	100
African Brazilian	54.01	7,770	(22)	5,335	(19)	58.5
Black (*preto*)	7.89	8,128	(57)	5,879	(44)	64.5
Mixed race (*pardo*)	46.12	7,708	(24)	5,265	(1)	57.7
Indigenous (*indígena*)	0.34	9,520	(407)	6,440	(168)	70.6
Asian (*amarelo*)	0.47	18,264	(716)	9,700	(350)	106.4
All	100	11,505	(31)	6,870	(19)	75.3
South Africa						
White	9.20	103,034	(2,979)	65,633	(1,747)	100
African	88.24	10,503	(119)	4,685	(20)	7.1
Black	79.39	9,630	(112)	4,403	(32)	6.7
Colored	8.85	18,340	(582)	8,382	(112)	12.8
Indian/Asian	2.45	35,737	(1,477)	20,907	(1,104)	31.9
Other	0.11	25,105	(4,678)	20,332	(2,773)	31.0
All	100	19,652	(353)	5,462	(32)	8.3

Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

Blacks and whites not only differ in their average incomes, but also in their distribution across income categories. Blacks in all three countries are concentrated at the bottom of the distribution, and whites at the top, as Figure 1 shows. Indeed, minorities in the US outnumber whites at the first decile of the income distribution: 26 percent of the population in this decile consists of blacks and 24 percent are Latinos, compared with 44 percent of whites. However, as we move up along the income levels, the share of blacks dramatically decreases to around 13 percent at the fifth decile and only 5 percent at the top one, with Latinos showing a similar pattern. Consequently, the percentage of whites rises to reach 68 percent of the population at the fifth decile and 82 percent at the tenth decile. Quite similarly, people of African descent in Brazil account for 70 percent of the population allocated to the first decile, 55 percent of those at the

fifth decile, but only 20 percent at the top. South Africa turns out to be the most extreme case. We only find a significant amount of whites in the last four deciles: 2 percent in the seventh, 5 in the eighth, and 22 and 61 in two top deciles. That is, whites outnumber blacks only in the highest decile, with blacks and colored being more than 98 percent of the population in the first six deciles, but only a third of the richest one.

Figure 1. Equivalized disposable income distribution by race



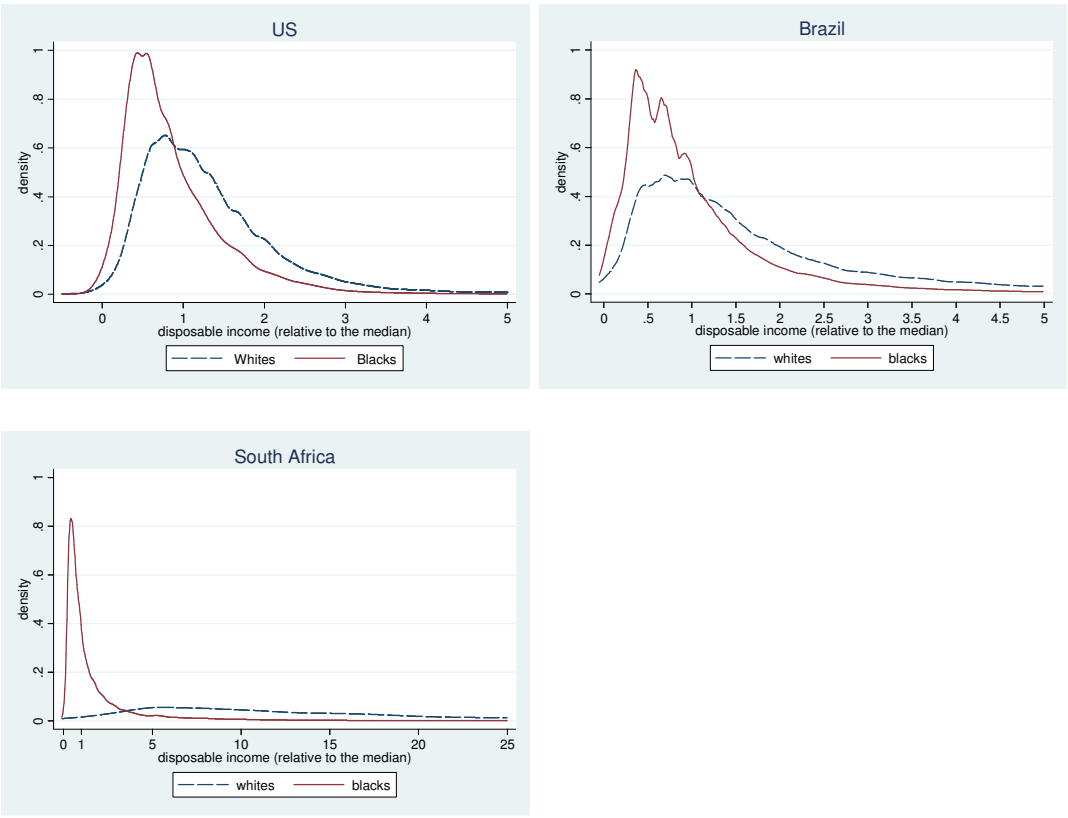
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

Figure 2 displays the corresponding density functions estimated by kernels[2], that is, the proportion of each race population at each income level, where income has been divided by the overall median of each country, in order to allow for comparability. These estimations show that the racial groups have different distributions in all countries, and that the proportion of blacks is higher than the corresponding percentage of whites below certain income level, but lower than whites above that point: this cut-off point is 90 percent of the median in the US, 110 percent of the corresponding

[2] These non-parametric estimations are based on adaptive kernels using a Gaussian kernel function.

median in Brazil, and 340 percent in South Africa. The degree of overrepresentation by blacks at the bottom of the distribution in South Africa is the largest among all three countries. Besides, it is larger in the US compared with Brazil, because the corresponding *relative density* of blacks is higher in the former country for those below 60 percent of the corresponding median income, but lower everywhere else.[3]

Figure 2. Equivalized disposable income densities by race



Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

Consequently, if we measure relative income poverty using the head count ratio or FGT(0) with the poverty line set at 60 percent of the national median income,[4] poverty is substantially higher among African descents than among whites in all three countries: 41, 37 and 35 percent of blacks lie below the poverty line in the US, Brazil

[3] The *relative density* of whites and blacks is the result of computing the ratio between the densities of both races: the number of blacks as a percentage of all blacks divided by the same share computed for whites at each income level (Handcock and Morris, 1998).

[4] This relative poverty line is only for comparative purposes. Using an absolute measure of poverty, 21 percent of population in Brazil lies below the well-known PPP 2$ per day, compared with 34 percent in South Africa according to the last World Development Report 2008. Even if this report does not compute the figure for developed countries it is expected to be very small in the US.

and South Africa, respectively, compared with around 17-18 percent of whites in both American countries, and only 1 percent in South Africa (see Table 2). This means that there is a higher black-white poverty differential in South Africa (34 percentage points) and in the US (24 percentage points) compared with Brazil (19 percentage points).[5] The same ranking in differentials in poverty by race is obtained when using other poverty indicators of the Foster, Greer and Thorbecke family such as the *poverty gap ratio* or FGT(1), and the FGT(2), which is sensitive to the level of inequality among the poor. In this last case, the racial gaps of Brazil and the US resemble each other more closely due to the high inequality among black poor people in Brazil. At the national level, poverty rates are 32 (South Africa), 27 (Brazil), and 24 (US) percent. Multiplying the poverty measure for each racial group by its demographic weight in the overall population, we can measure the contribution of each ethnic group to overall poverty. Given the larger demographic weight of blacks in South Africa, and to a lesser extent in Brazil, it results that around 99 percent of all poverty observed in the former country and 67 to 68 percent in the latter, is black poverty. In the US this figure is only 22 to 24 percent, compared with 46-48 of whites.

[5] See Gradín (2008, 2009) for a deep analysis of decomposition of the differential in poverty rates among racial groups in, respectively, the US and Brazil.

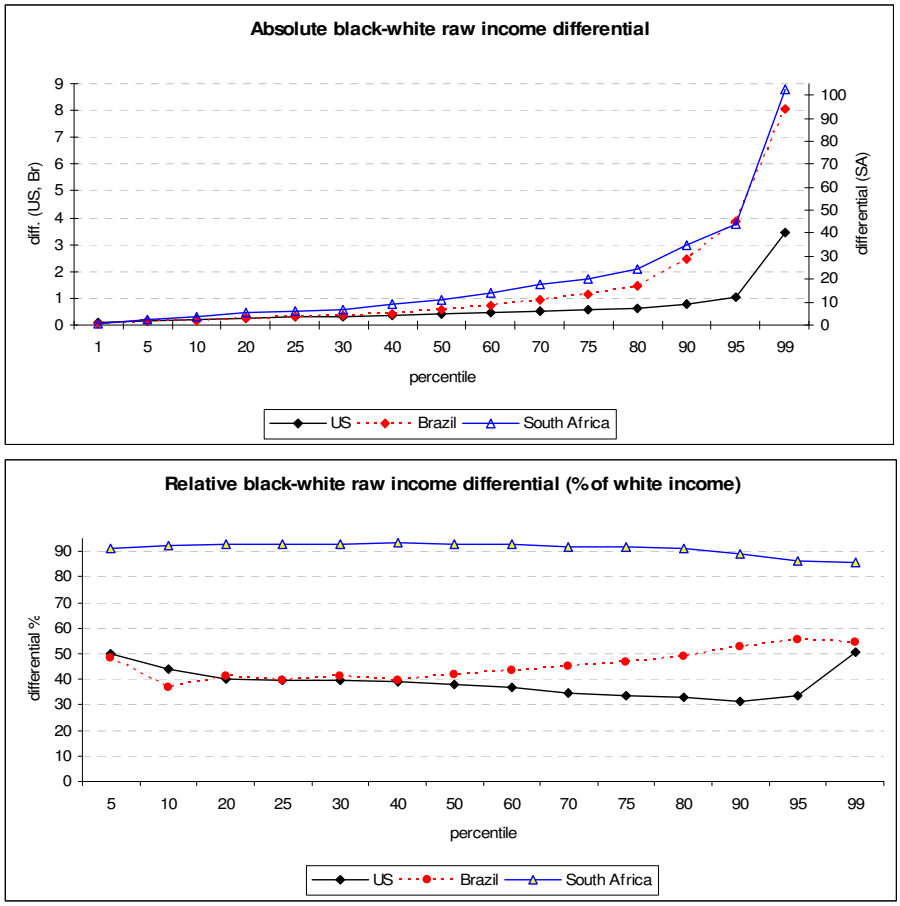
Table 2. Summary indicators of relative poverty by race
Bias-corrected Bootstrap standard errors in parenthesis (500 replications)

	US			Brazil			South Africa		
Measures	**whites**	**African**	**all**	**whites**	**African**	**all**	**whites**	**African**	**all**
FGT(0) (Head-count)	17.25	41.14	24.08	17.68	36.63	27.23	0.94	34.78	31.61
	(0.123)	(0.370)	(0.113)	(0.100)	(0.113)	0.079)	(0.164)	(0.222)	(0.204)
subgroup share	47.4	22.5	100	31.9	67.3	100	0.3	99.2	100
FGT(1)	5.95	15.99	8.59	6.94	15.15	11.07	0.38	13.19	12.00
	(0.065)	(0.193)	(0.057)	(0.048)	(0.059)	0.039)	(0.080)	(0.100)	(0.093)
subgroup share	45.8	24.5	100	30.8	68.3	100	0.3	99.1	100
FGT(2)	3.77	9.29	5.12	4.00	8.76	6.39	0.22	6.84	6.2
	(0.109)	(0.181)	(0.080)	(0.037)	(0.046)	0.031)	(0.054)	(0.066)	(0.061)
subgroup share	48.7	23.9	100	30.6	68.3	100	0.3	99.0	100

Notes: FGT()= Foster-Greer –Thorbecke family of indices with poverty line fixed at 60 percent of median income in each country.
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06.

Finally, we address the question of how the raw racial differential in income varies across income quantiles. Figure 3 shows that in all three cases the pattern for this differential by race is unambiguously increasing with income in absolute terms, even if in the case of South Africa we need to use a different scale due to their higher magnitude. The pattern of income differentials expressed as a percentage of whites' income differs across countries, however. In South Africa absolute income differentials increase proportionally with the income of whites, so that the percentage they represent of whites' income is approximately constant along the income scale, as it can be appreciated in the second graph in Figure 3. In the other countries, it is noteworthy that the global pattern of absolute differentials is similar in the US and in Brazil below the 40 percentile, but above that level, the absolute differential in Brazil increases faster than in the US, for reasons that will become clear later. As a consequence, the pattern of relative differentials across income quantiles expressed as a percentage of whites' median income is increasing in Brazil but decreasing in the US, except at the very top.

Figure 3. Absolute and relative black-white raw income differentials



Estimate values and standard errors in the Appendix

Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

4. Methodology

4.1 The Oaxaca-Blinder approach

We examined the contribution of a number of household characteristics to the differential in average household income among racial groups in the United States and Brazil by applying the well-known regression-based Oaxaca-Blinder decomposition approach.[6] In our framework, the *i*th person in each group $g=w$ (whites) or $g=b$ (blacks) in each country has an equivalized household income y_i^g that can be estimated as a function of a vector x_i^g of characteristics of his or her household:

$$\hat{y}_i^g = x_i^g \hat{\beta}^g \,, \qquad \textbf{(1)}$$

[6] See Oaxaca (1973) and Blinder (1973).

where $\hat{\beta}^g$ is the associated OLS vector of coefficient estimates.[7]

We included among the explanatory variables a number of characteristics of the household reference person that can be considered likely to influence his or her ability to earn income. For example, in the case of the US, we consider demographic variables such as household type, as this may also affect the ability of the household head to get a job: we distinguished among households composed of a married couple, with additional distinction according to the sex of the head, and those composed by a male or a female without a spouse present. In the case of female heads, we additionally distinguished whether or not the household included children in order to identify single mothers. We also included the number of children and the number of adults in the household, reference person's age (below 25, 25-55, and above 55 years old), attained education (primary, some secondary, secondary, some college, and college) and citizenship (native with/without foreign born parents, foreign born naturalized, and not naturalized), as well as head's labor force participation (a dummy indicating whether the head is employed plus the number of weeks and hours worked), and a dummy indicating whether the head is not employed but receives any non labor income. Given that household income can also be provided by other household members different from the reference person, we included three variables referring to other adults in the household not enrolled in further education: the share who achieved secondary and tertiary education, the share who are employed, and the share receiving non labor income[8]. Other variables included were the geographic region of residence and the size of the

[7] Note that unlike earnings regressions, there is no problem of sample selection bias in this context, because household income is observed for the whole sample, regardless whether they have individual income or not.

[8] In all four cases the variables take the value zero in households without any of such adults.

metropolitan area, in order to take into account potential differences in economic opportunities.[9]

Similar variables were considered in the case of Brazil and in South Africa, even if with a few peculiarities based on available information. In Brazil, for example, attained education by the household head was expressed in years of schooling (none, 1 to 3, 4 to 7, 8 to 10, 11 to 14, and 15 or more), immigrant status of the head differentiated immigrants from the same and from different State and variables informing about the area of residence are adapted to Brazilian context (urbanized village, non urbanized village, isolated urban area, rural agglomerate, and others). In South Africa, the survey does not provide information neither about the type of household, except for the sex of the reference person, nor for immigration status of the household head. Variables for participation in the labor market for this country had been constructed using information of income sources. Since we estimated the probability of a person being poor with all explanatory variables collected at the family level, our estimated robust standard errors took into account individuals being "clustered" across families.[10]

This simple econometric specification allows us to identify the statistical association between equivalized disposable income and each household attribute, when the other characteristics are controlled for. However, we should be cautious in interpreting the results, as no control for possible endogenous sources was made, and no causal relationship can be assessed.[11]

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[9] Since we estimated the probability of a person being poor with all explanatory variables collected at the household level, the standard i.i.d. assumption in OLS regressions is violated. For this reason, our estimated robust standard errors took into account individuals being "clustered" across households. See, for example, Cappellari and Jenkins (2004) for a justification of this.

[10] See, for example, Cappellari and Jenkins (2004) for a justification of this.

[11] For example, consider the potential double causality in the case of the number of dependent children in the household. A large number of children directly induces a low equivalized income by increasing the

Given that the income average in group *g* is equal to the average predicted probability for this group, $\bar{y}^g = \bar{\hat{y}}^g$, taking the characteristics of whites as reference, we break up the observed differential among whites and blacks into two distinct terms:

$$\bar{y}^w - \bar{y}^b = \bar{x}^w\hat{\beta}^w - \bar{x}^b\hat{\beta}^b = \bar{x}^w\left(\hat{\beta}^w - \hat{\beta}^b\right) + \left(\bar{x}^w - \bar{x}^b\right)\hat{\beta}^b, \quad \textbf{(2)}$$

where $\bar{x}^w\hat{\beta}^b$ is the underlying counterfactual distribution in which blacks are given whites' characteristics but keep their own coefficients. Thus, the first term in the right hand side in **(2)** evaluates the expected change in the average income due to the shift in coefficients (*aggregate coefficients or unexplained effect*), and the second one results from the shift in characteristics (*aggregate characteristics or explained effect*). To evaluate the individual contribution of each variable (or set of variables) to the total explained difference (*detailed* decomposition), we estimate a set of weights $w^k_{\Delta\bar{x}}$ that measure the individual contributions of characteristic *k* (*k*=1,…, *K*) to explain the raw differential, such that:

$$W^k_{\Delta\bar{x}} = \left(\bar{x}^b_k - \bar{x}^w_k\right)\hat{\beta}^b_k, \ \sum_{k=1}^{K} W^k_{\Delta\bar{x}} = \left(\bar{x}^b - \bar{x}^w\right)\hat{\beta}^b. \quad \textbf{(3)}$$

4.2 The DiNardo-Fortin-Lemieux approach

The DiNardo, Fortin, and Lemieux (1996) - DFL - approach allows us to extend the analysis of differentials to the entire distribution instead of focusing at the mean. Each individual observation is drawn from some joint density function *f* over (*y, x, g*). The marginal distribution of income for each group *g* is:

$$f^g(y) \equiv f(y \mid g) = \int_x f(y, x \mid g)dx = \int_x f(y \mid x, g)\cdot f_x(x \mid g)dx, \quad \textbf{(4)}$$

that is, it is obtained as the product of two conditional distributions, where:

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number of equivalent adults, while not providing additional money. However, this characteristic could also be interpreted as a consequence of living in a poor, less-educated household.

$$f_x(x \mid g) \equiv \int_y f(y, x \mid g) \,. \tag{5}$$

Then, we can define the counterfactual distribution $f^x(y)$ as the distribution that would prevail if blacks kept their own conditional income distribution (coefficients), but had the same characteristics (marginal distribution of *x*) of whites. This counterfactual distribution for blacks can be produced by properly reweighting its own income distribution:

$$f^x(y) = \int_x f(y \mid x, g = b) \cdot f_x(x \mid g = w) dx = \int_x f(y \mid x, g = b) \cdot \psi_x \cdot f_x(x \mid g = b) dz = \int_x \psi_x f(y, x \mid g = b) dx \tag{7}$$

Following DiNardo, Fortin and Lemieux (1996), the reweighting scheme ψ_x is expressed as the product of two ratios:

$$\psi_x = \frac{f_x(x \mid g = w)}{f_x(x \mid g = b)} = \frac{P(g = b)}{P(g = w)} \frac{P(g = w \mid x)}{P(g = b \mid x)} \,. \tag{8}$$

The first ratio is just the weighted share of the pooled sample that belongs to each race and can be ignored because it is a constant. The second one can be obtained pooling white and black samples and estimating a logit model for the probability of being white conditional on *x*.

Now, in parallel to the previous Oaxaca-Blinder procedure, we use the counterfactual distribution for the following decomposition of the differential between both groups for densities *f*:

$$f^b(y) - f^w(y) = \left[f^b(y) - f^x(y)\right] + \left[f^x(y) - f^w(y)\right]. \tag{9}$$

The first term in the previous equation is the part of the difference explained by characteristics or characteristics effect, while the second one is the unexplained part or coefficients effect, with superscript *b*, *w* or *x* indicating whether it refers, respectively, to black, white or the reweighted counterfactual income distribution (for characteristics *x*). Similarly we can decompose the income differential at any quantile *Q*, as well as the differential by race for any other summary measure *P*, like a poverty index:

$$Q^b(p) - Q^w(p) = \left[Q^b(p) - Q^x(p)\right] + \left[Q^x(p) - Q^w(p)\right], \qquad p \in (0,1),$$
$$P^b(y) - P^w(y) = \left[P^b(y) - P^x(y)\right] + \left[P^x(y) - P^w(y)\right]. \qquad \textbf{(10)}$$

In order to obtain the detailed decomposition, we want to look at the impact of changes in a single covariate (or set of covariates) x_j instead of the whole vector of coefficients, by computing a new counterfactual distribution $f^{x_j}(y)$ in which the reweighting factor ψ_{x_j} is obtained setting all the other logit coefficients but this one to zero (Lemieux, 2002). Then, the explained contribution of characteristics x_j is given by $\left[f^b(y) - f^{x_j}(y)\right]$. Alternatively, we can shift all the coefficients in a specific sequence, computing the contribution of each factor as the result of changing its associated coefficients. This recalls the well known path-dependency problem in inequality decomposition, because the contribution of a factor to the overall differential in income will depend on the order in which we consider them. This difficulty can be overcome by computing the Shapley decomposition that results from averaging over all possible sequences (Chantreuil and Trannoy, 1999; Shorrocks, 1999).

5. Explaining the difference in equivalized household income in Brazil, the US and South Africa

Once we have documented the differentials in income distribution across racial groups, we will investigate what kind of factors lie behind these gaps. We start applying the well-known Oaxaca-Blinder decomposition to differentials in average income by race, after which we will undertake the decomposition for differentials across income quantiles, densities and poverty indices using the DFL approach.

5.1 Difference in income distribution at the means

The black-white differential in equivalized households' income for 2007 is 51 percent of the country median in the US, 109 percent in Brazil and a huge 1,674 percent in South Africa (Table 3). Observed characteristics explain about a half of this

differential in the first two countries, 48 percent in the US and 50 percent in Brazil, but the reasons substantially differ from one another. In Brazil the primary explanatory factors are related to the education of household members, accounting for 36 percent of the gap. In the US, however, the main factors turn to be demographic, explaining 20 percent of the differential, while education explains about 14 percent, and labor participation of households members, especially of those other than household head, explain a similar amount, 13 percent. Characteristics explain much less of the black-white differential in South Africa, 23 percent, and most of that is attributable to the educational gap (15 percent of the overall differential). Note that this relative contribution of education is similar to the contribution reported for the US and less than a half of that in Brazil, but in absolute terms is much higher than in both countries, education in South Africa explains a gap in income which is 2.5 times the national median, compared with 0.4 times in Brazil and 0.07 in the US. In fact, all absolute effects tend to be larger in South Africa than in any other country.

Table 3. Oaxaca-Blinder decomposition of differentials in average household income between whites and population of African descent

	US				Brazil				South Africa			
	Estimate	**% diff.**	**Std. Err.**	**P>|z|**	**Estimate**	**% diff.**	**Std. Err.**	**P>|z|**	**Estimate**	**% diff.**	**Std. Err**	**P>|z|**
Income (relative to the median)												
Whites	1.41		0.006	0.00	2.22		0.015	0.00	18.64		0.861	0.00
African	0.90		0.011	0.00	1.13		0.006	0.00	1.90		0.038	0.00
White-black differential	**0.51**	**100**	**0.013**	**0.00**	**1.09**	**100**	**0.015**	**0.00**	**16.74**	**100**	**0.862**	**0.00**
Explained differential	**0.24**	**47.6**	**0.014**	**0.00**	**0.55**	**50.4**	**0.010**	**0.00**	**3.87**	**23.1**	**0.198**	**0.00**
Geographical factors	**-0.01**	**-1.6**	**0.008**	**0.34**	**0.08**	**7.7**	**0.004**	**0.00**	**0.19**	**1.2**	**0.027**	**0.00**
Region	0.02	3.0	0.006	0.02	0.07	6.6	0.004	0.00	0.09	0.5	0.035	0.01
Urban/rural	-0.02	-4.6	0.004	0.00	0.01	1.1	0.001	0.00	0.11	0.6	0.027	0.00
Demographics	**0.10**	**20.2**	**0.009**	**0.00**	**0.06**	**5.5**	**0.003**	**0.00**	**0.51**	**3.0**	**0.032**	**0.00**
Household type	0.05	9.9	0.007	0.00	0.00	0.1	0.001	0.02	0.10	0.6	0.017	0.00
N. of children	0.03	4.9	0.003	0.00	0.06	5.7	0.002	0.00	0.33	2.0	0.025	0.00
N. of adults	0.00	0.0	0.000	0.99	-0.02	-1.4	0.001	0.00	0.10	0.6	0.015	0.00
Immigration (ref. person)	0.01	1.2	0.003	0.07	0.00	0.0	0.000	0.62	-	-	-	-
Age (ref. person)	0.02	4.2	0.003	0.00	0.01	1.1	0.001	0.00	-0.02	-0.1	0.011	0.03
Education	**0.07**	**14.3**	**0.007**	**0.00**	**0.39**	**36.0**	**0.009**	**0.00**	**2.49**	**14.9**	**0.182**	**0.00**
Reference person	0.05	10.3	0.004	0.00	0.34	31.7	0.009	0.00	2.07	12.4	0.160	0.00
Other adults	0.02	4.0	0.006	0.00	0.05	4.3	0.003	0.00	0.42	2.5	0.067	0.00
Labor participation	**0.07**	**13.2**	**0.006**	**0.00**	**0.01**	**0.8**	**0.002**	**0.00**	**0.72**	**4.3**	**0.061**	**0.00**
Reference person	0.02	3.5	0.003	0.00	0.01	0.8	0.002	0.00	0.27	1.6	0.026	0.00
Adults	0.05	9.7	0.004	0.00	0.00	-0.1	0.000	0.01	0.45	2.7	0.052	0.00
Nonlabor income	**0.01**	**1.5**	**0.002**	**0.00**	**0.00**	**0.4**	**0.001**	**0.00**	**-0.05**	**-0.3**	**0.014**	**0.00**
Unexplained (conditional black-white differential)	**0.26**	**52.4**	**0.000**	**0.00**	**0.54**	**49.6**	**0.000**	**0.00**	**12.87**	**76.9**	**0.000**	**0.00**

Note: regression estimates in which these decompositions are based, are included in the Appendix

Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

The divergence between explanatory factors in the US and Brazil is due to the fact that the education levels of household heads explains 31 percent of the overall gap in the latter instance, compared with only 10 percent in the former. Education of other members in the household appears to explain about 4 percent in both countries. It is well-documented that Brazil exhibits one of the most unequal distributions of years of education in the world (De Ferranti *et al*., 2003). Although great progress has been made in this indicator during recent decades, the Gini index for years of schooling among those aged between 25 and 65 years was still 41 percent in 2001, which is the highest level in Latin America after Bolivia (43.4), and a few Central American countries, and substantially different from the other main economies in the region (36.6 in Mexico and 22.2 in Argentina). This fact is reflected in the racial distribution, given

that blacks drop out of the educational system at a younger age. The adult illiteracy rate is 15 percent among Afro-Brazilians, in contrast to 7 percent for the white population. Additionally, the proportion of black people aged at least 25 years who had no education is about 19 percent, and the proportion with 15 or more years of studies is lower than 4 percent, while the corresponding percentages are 9 and 13 percent for whites. Differences in the quality of education have often been stressed as important reasons for inequality of opportunity in Brazil (Leite, 2005), because students from the poorest families are overrepresented in public schools, which typically provide education of lower quality. Indeed, according to our own estimates, the proportion of students aged 16 years or less attending a private school is 22 percent for whites, but only 11 percent for Afro-Brazilians. This difference increases for those aged over 18 years: 48 percent of whites, compared to 21 percent of Afro-Brazilians attend a private institution. There is also evidence that Afro-Brazilians attending university are underrepresented in those degrees that lead to higher earnings (UNDP, 2005). The educational gap is even larger in South Africa. About 14 percent of blacks but less than 1 percent of whites over 25 years old have no education at all. Only 24 percent of blacks have completed at least 12^{th} grade, compared with 77 percent of whites; and less than 2 percent of blacks, compared with 14 percent of whites, have attained a university degree.

Lower participation in the labor market by members other than the household head is responsible for most of the larger explicative power of this factor in the US compared with the other countries: 10 versus 3 and virtually zero percent, respectively. This is driven by the low employment rates of poorly-educated young black males in the US compared to other groups, a fact for which several explanations have been offered, such as its being the direct and indirect consequence of large and increasing

incarceration rates (even in a context of decreasing criminality), or of the migration of jobs from inner cities to suburbs.[12] Again, the lower relative contribution of this factor in South Africa hides the fact that the absolute contribution is actually larger in this country.

The larger relevance of demographic factors in the US compared with the other two countries is related to the larger number of unmarried female heads and single mothers (household type); these explain 10 percent of the differential in the US, but nothing in Brazil. In fact, almost 70 percent of all black children in the US are born to unmarried mothers (US DHHS, 2004) and, consequently, about half of all black children live with a single mother. Blacks are less likely to live in married-couple families (40 percent compared with 68 percent of whites), and more likely to live in a female-headed family without a spouse present (45 percent, compared with 20 percent); 26.5 of blacks live in single-mother families, compared with only 6.6 among whites.[13] Furthermore, blacks tend to have more children than whites in all three countries, explaining a similar proportion of the racial differential in the US and Brazil (5 and 6 percent, respectively) which again is lower in relative terms in South Africa (2 percent), but larger in absolute terms. The relatively younger age of black household heads compared with whites is also a greater disadvantage in the US (almost 4 percent, compared with 1 percent in Brazil and nothing in South Africa). The number of adults in the household explains nothing in the US, below 1 percent in South Africa, but is

[12] For example Holzer, Raphael and Stoll (2006) argued that the high rates of crime and incarceration among young black males in the US limit the employment opportunities not only of those directly engaged in such behavior, but also of those not engaged in crime due to statistical discrimination by employers. Further, Foster-Bey (2006) found evidence supporting that spatial mismatch in the blue-collar sector affected labor participation of young males residing in the urban core of metropolitan areas.

[13] There is no consensus about the causes of changes in marriage, divorce, and nonmarital childbearing that occurred during past decades in the US leading to this situation. Changes in social norms, declining wages among low-skilled men, and the unintended incentives of the welfare system have been pointed out among the possible explanations (MacLanahan, 2007).

associated with a negative effect in Brazil, indicating that this is an "advantage" of blacks in that country, in fact the only one.

Finally, geography also plays quite a different role in these countries. In Brazil, the fact that African descendants are overrepresented in the poorest regions (mainly in the North and Northeast of the country) explains 7 percent of the racial differential in average income, with their overrepresentation in more rural areas playing a more marginal role (1 percent). However, the overrepresentation of blacks in certain US regions with lower income (such as the South Atlantic and Eastern South Central areas) has a lesser impact, explaining 3 percent of the gap, while the concentration of this race in the largest metropolitan areas has a compensating negative characteristics effect of almost 5 percent, that is, it would justify a higher income for blacks. This is, in fact, the only "advantage" of African American endowments in the US. In South Africa, blacks are overrepresented in rural areas (where they are 99 percent of the population compared with 85 percent in urban areas) and underrepresented in the two richest regions (Western Cape, 80 percent, and Gauteng, 83 percent, compare with 90 percent or more in the rest). This explains about 1.2 percent of the differential by race.

The fact that observed characteristics explained a half of the gap in average household incomes in Brazil and in the US, implies that another half remains unexplained. If we observed a differential of 51 and 109 percent of the median income between races in the US and Brazil, respectively, then the coefficient effect indicates the *conditional* gap, that is: the differential that would prevail if blacks shared the same characteristics as whites in their countries. This conditional gap is, respectively, still 26 and 54 percent of the corresponding national median. In the case of South Africa, still most of the differential remains after controlling for characteristics, 77 percent, which is almost 13 times the country median income.

5.2 Difference in income distribution along the whole distribution

The OB and DFL methods are compared in their decomposition of the average differential in Table 4. Results show that in Brazil both methods are equivalent, while in the case of the US the DFL method increases the contribution of demographic factors and education, and reduces the effect associated with labor participation compared with the OB approach, thus increasing the total proportion explained by characteristics. Similarly, in South Africa, the share explained by characteristics, especially by education, substantially increase with DFL approach. Note, however, that the qualitative results of the comparative analysis among all three countries previously discussed using the OB approach are kept under the DFL method. The DFL method has the advantage of allowing the analysis to go beyond the difference at sample means, but at the cost of restricting the number of explicative factors for the sake of tractability, reason for what we will center the discussion below in the main five aggregate domains shown in Table 4.

The first question we can answer is how the overrepresentation of blacks below a certain cut-off point in each country is explained by our model. In Figure 4 we respectively display in each row: the actual and counterfactual densities; the raw and the explained differentials; and the differential explained by the main explanatory factors. From the graphs in the first two rows, we can infer that in all three countries, more clearly in Brazil, the differential in densities is fully explained by observed household characteristics at the bottom and top income levels, but a large share remains unexplained at the middle. That is, characteristics fully explain why relative poverty is so high among people of African descent, and why there are less rich people from this race, but they are less successful in explaining the weaker black middle class, for which unobserved factors turn to play a more active role.

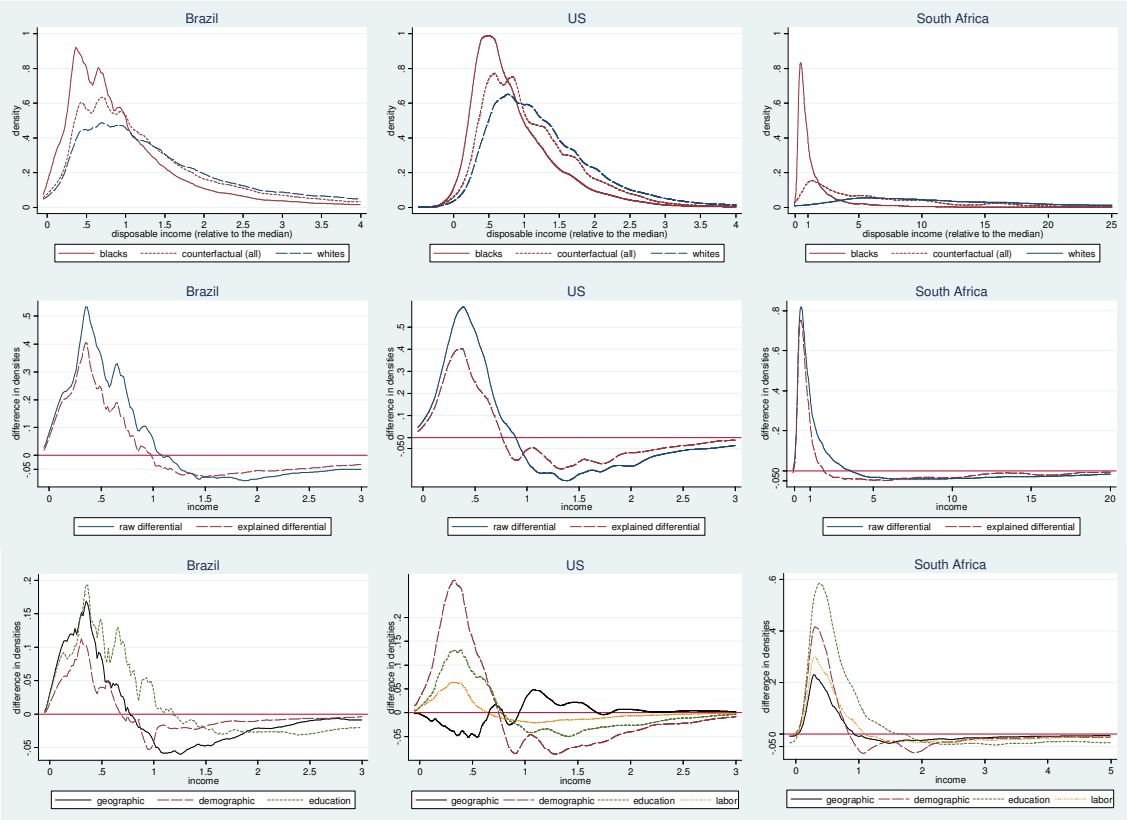
Table 4. Oaxaca-Blinder versus DiNardo-Fortin-Lemieux decomposition of differentials in average household income between whites and population of African descent

Standard errors in parenthesis

	US				Brazil				South Africa			
	Estimate		% diff		Estimate		% diff		Estimate		% diff	
	OB	DFL*	OB	DFL*	OB	DFL*	OB	DFL*	OB	DFL*	OB	DFL*
white-black differential (relative to the country's median)	0.51	0.51	100	100	1.09	1.09	100	100	16.74	16.74	100	100
	(0.013)				(0.015)				(0.862)			
explained	0.24	0.29	47.6	57.5	0.55	0.54	50.4	49.7	3.87	5.57	23.1	32.9
	(0.014)	(0.022			(0.010)	(0.014)			(0.196)	(0.385)		
geographic	-0.01	-0.01	-1.6	-2.4	0.08	0.07	7.7	6.9	0.19	0.47	1.2	2.8
	(0.009)	(0.012)			(0.004)	(0.007)			(0.027)	(0.061)		
demographic	0.10	0.18	20.2	35.0	0.06	0.09	5.5	7.8	0.51	1.04	3.0	6.2
	(0.009)	(0.012)			(0.003)	(0.005)			(0.030)	(0.143)		
education	0.07	0.09	14.3	18.5	0.39	0.38	36.0	35.0	2.49	3.40	14.9	20.1
	(0.006)	(0.010)			(0.009)	(0.010)			(0.181)	(0.285)		
labor participation	0.07	0.03	13.2	6.7	0.01	0.00	0.8	-0.1	0.72	1.10	4.3	6.5
	(0.003)	(0.009)			(0.002)	(0.002)			(0.056)	(0.216)		
non labor	0.01	0.00	1.5	-0.4	0.00	0.00	0.4	0.1	-0.05	-0.44	-0.3	0.0
	(0.002)	(0.003)			(0.001)	(0.001)			(0.014)	(0.070)		

Notes: * DFL Shapley estimates: biased-corrected standard errors (200 replications) in parenthesis.
Regression estimates in which these decompositions are based, are included in the Appendix
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

Figure 4. Raw and explained black-white differential in densities by race*



(*) DFL for each factor being the only one to change.

Regression estimates in which these decompositions are based, are included in the Appendix
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

The previous conclusion implies more specifically, as it is shown in Table 5, that 65 percent of the racial gap in poverty rates is explained in the US, 75 percent in Brazil, and more than 90 percent in South Africa. These percentages increase in the first two countries to around 80 percent if we measure the FGT(2). In all cases, characteristics explain substantially more of the gap in poverty indices than they did of the mean income differential. Regarding which factors are more important, it turns out that demographics explain more than 40 percent of the differential in the head-count ratios in the US, more than 10 percentage points out of a total 15.6 percent gap, with education explaining an additional 20 percent of the differential (or 4.7 percentage points), and labor participation 9 percent (2.1 percentage points). Geographic variables in the US have a negative contribution to the racial poverty gap of near 7 percent (1.6 percentage points). In Brazil, geographic and education appear to explain a similar share, 30 and 28 percent which means more than 5 percentage points out of the 19 percent differential, with demographic factors explaining much less, 17 percent (around 3 percentage points), and with labor participation playing no significant role. It is in South Africa, however, where education stands out the most, explaining 38 percent of the differential, which means 13 percentage points out of 31, with demographics explaining an additional 26 percent, labor participation 19 percent, and geographic area of residence about 12 percent (that is, respectively about 9, 6.5 and 4 percentage points of the racial poverty gap). Indeed, the last row of graphs in Figure 4 illustrates how the explanatory factors for differentials in the relative proportion of people of each race vary along the income scale. It is clear that geographic factors are as important as education, if not more, for explaining the higher proportion of blacks at lowest income levels in Brazil, while at middle and higher incomes education becomes

undistinguishable the most important factor. In the case of the US and South Africa, it seems that the role of all factors are more similar along the income scale.

Table 5. DiNardo-Fortin-Lemieux decomposition of black-white differentials in poverty indicators

US	FGT(0)		% diff.	FGT(1)		% diff.	FGT(2)		% diff.
blacks	41.1			16.0			9.3		
whites	17.2			6.0			3.8		
differential	23.9	(0.690)	100	10.0	(0.393)	100	5.5	(0.369)	100
explained*	15.6	(0.733)	65.3	7.1	(0.374)	70.6	4.3	(0.288)	78.0
geographic	-1.6	(0.332)	-6.6	-0.5	(0.175)	-4.9	-0.1	(0.152)	-2.2
demographic	10.4	(0.528)	43.7	4.6	(0.266)	46.0	2.7	(0.207)	48.2
education	4.7	(0.515)	19.8	1.9	(0.228)	19.2	1.1	(0.145)	19.9
labor participation	2.1	(0.613)	8.9	1.1	(0.309)	10.5	0.7	(0.201)	12.0
non labor	-0.1	(0.001)	-0.5	-0.0	(0.001)	-0.2	0.0	(0.001)	0.1
Brazil									
blacks	36.6			15.2			8.8		
whites	17.7			6.9			4.0		
differential	19.0	(0.261)	100	8.2	(0.138)	100	4.8	(0.099)	100
explained*	14.2	(0.243)	75.1	6.6	(0.121)	80.0	3.9	(0.084)	82.4
geographic	5.3	(0.187)	28.2	2.6	(0.091)	31.8	1.6	(0.062)	33.6
demographic	3.1	(0.148)	16.6	1.5	(0.069)	18.2	0.9	(0.043)	19.0
education	5.6	(0.107)	29.7	2.4	(0.047)	29.0	1.4	(0.031)	28.6
labor participation	-0.0	(0.043)	-0.1	0.0	(0.030)	0.4	0.0	(0.028)	0.7
non labor	0.1	(0.001)	0.5	0.0	(0.000)	0.5	0.0	(0.000)	0.5
South Africa									
blacks	34.8			13.2			6.8		
whites	0.9			0.4			0.2		
differential	33.8	(0.613)		12.8	(0.293)		6.6	()	
explained*	30.7	(0.634)	90.9	11.7	(0.297)	91.0	6.0	()	90.2
geographic	3.9	(0.352)	11.6	1.4	(0.141)	10.8	0.6	()	9.5
demographic	8.7	(0.548)	25.6	3.2	(0.209)	25.0	1.6	()	24.0
education	13.0	(0.713)	38.5	4.6	(0.321)	36.3	2.3	()	35.0
labor participation	6.5	(0.921)	19.1	2.6	(0.364)	20.2	1.4	()	21.5
non labor	-1.3	(0.150)	-4.0	-0.2	(0.035)	-1.3	0.0	()	0.2

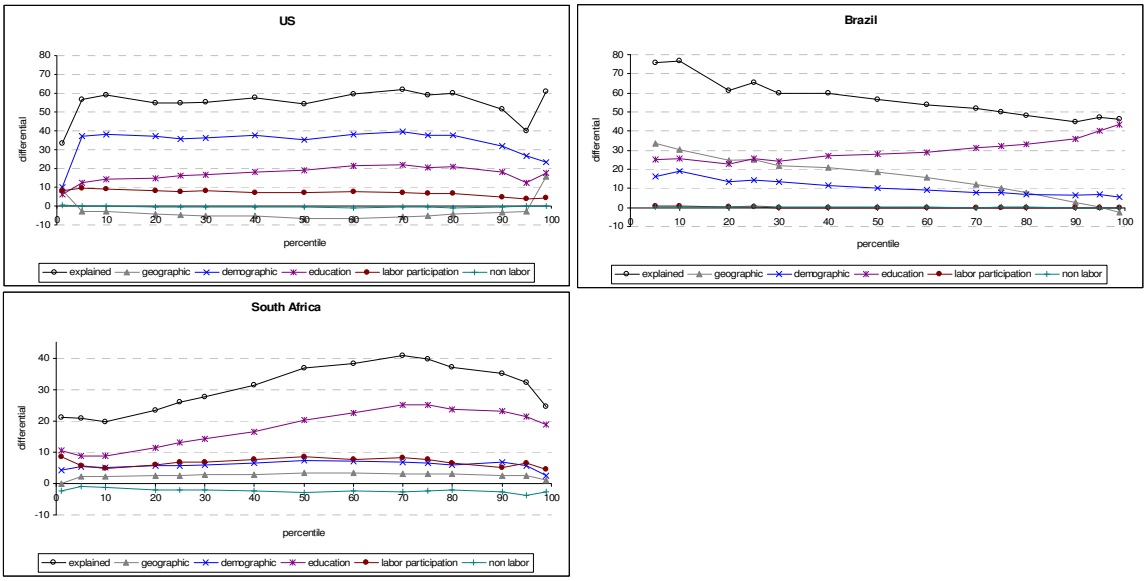
(*) DFL Shapley estimates
Regression estimates in which these decompositions are based, are included in the Appendix.
Biased-corrected standard errors (200 replications) in parenthesis.
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

Secondly, the same type of results are found when instead of looking at differentials in densities at each income level we look at the problem in a different perspective, addressing the question of how the explanatory factors of black-white income differentials in each country varies across quantiles of the distribution, which is done in Figure 5. The pattern of explanatory factors in the US is roughly stable along the income distribution, that is, the contribution of each factor, and so the sum of all of

them, raise parallel to the observed differential such that the former explain a constant percentage of the later. The main exception is the slightly increasing role played by education in detriment of labor participation.[14] In Brazil, the factors explaining racial differential change along income quantiles, however. Globally, the share of income differentials which are explained by characteristics decreases with higher income quantiles, but also the individual contributions differ. While at lower quantiles geographic factors are at least as important as education, the latter becomes the most outstanding explicative factor for income differentials at middle and top quantiles. Indeed, education explains an increasing share of the raw differential as we move up in the income distribution, while demographic and geographic factors follow the opposite trend. Thus, the reason of why the racial income differential is increasing with whites' income in Brazil after the 40 percentile, while decreasing in the US, is related to a higher race inequity in the access to education in the former country, especially to higher studies. In the case of South Africa, the share of the differential explained by characteristics increases with higher income quantiles until the 70 percentile, declining above that level. Contrary to Brazil, demographic factors become increasingly important while the other factors remain more o less stable.

[14] Another exception is found at the extremes, first and last percentile, where geographic factors tend to be more explicative of the differential in income by race, in contrast with the negative contribution in the rest of the distribution.

Figure 5. Explained[*] white-black differential by income quantiles by race



(*) DFL Shapley estimates. Estimate values, standard errors and regression estimates in which these decompositions are based, are included in the Appendix.
Source: Own construction based on CPS, 2007; PNAD, 2007; IES, 2005/06

6. Conclusions

In this paper we have analyzed the differential in average household income between African and European descendants in three countries at different levels of human and economic development, and with different patterns of racial interaction. In all countries, but more intensely in South Africa, African descents are more likely than whites to be confined to the bottom of the income distribution, which is reflected in higher relative poverty rates, especially in the US, and lower average income than whites, with a larger gap in South Africa and Brazil. The differentials in income are increasing in absolute terms along the income scale in all three countries, while the pattern of gaps as a percentage of the income of whites varies across countries: it is roughly flat in South Africa, increasing in Brazil, and decreasing in the US.

Using an Oaxaca-Blinder approach, we have analyzed the racial gap in average equivalized household income in these countries. Around a half of this differential can be explained by the observed characteristics in the US and Brazil, with demographic factors appearing more relevant in the US, especially the type of household and the

number of children, and the large educational gap being the most single factor explaining Brazilian racial inequality. The performance of households members in the labor market are important in the US but not in Brazil, especially due to the lower employment rates of young unskilled black males in the former country. The contrary occurs with geographical area of residence, which is important in Brazil, but not in the US. South Africa turns out to have the largest absolute gaps explained by all characteristics. The relative contribution of educational gap between blacks and whites appears to be the main explanatory factor in South Africa. Despite that, characteristics jointly explain less than a quarter of the differential in incomes, the lowest among all countries. Even if blacks had the same observed characteristics as whites in these three countries, a substantial (conditional) differential would still persist in average incomes.

The distributional DFL analysis shows that in general observed characteristics in all three countries explain better why there are relatively more poor people and less rich among blacks, than why the black middle class is so weak. It further shows that in all countries, but especially in Brazil, education becomes increasingly important to explain the racial income differentials at higher incomes, while other factors like geography in Brazil or labor participation in the US are relatively more important to explain differentials at the bottom of the distribution, and so the racial poverty gap.

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APPENDIX

Table A1. Oaxaca-Blinder Income OLS regressions, US

Dependent variable: household equivalized disposable income	**Coefficient**	**Std. Err.**	**P>z**
New England	0.157	0.000	0.000
East North Central	-0.024	0.000	0.000
West North Central	-0.054	0.000	0.000
South Atlantic	0.020	0.000	0.000
East South Central	0.021	0.000	0.000
West South Central	-0.054	0.000	0.000
Mountain	0.032	0.000	0.000
Pacific	0.132	0.000	0.000
Non metropolitan area	-0.464	0.000	0.000
0.1-0.25 million inhabitants	-0.362	0.000	0.000
0.25-0.5 million inhabitants	-0.349	0.000	0.000
0.5-1 million inhabitants	-0.307	0.000	0.000
1-2.5 million inhabitants	-0.222	0.000	0.000
2.5-5 million inhabitants	-0.114	0.000	0.000
Family: Male-headed married couple	0.085	0.000	0.000
Family: Male (no spouse)	-0.038	0.000	0.000
Family: Female (no spouse, no children)	-0.202	0.000	0.000
Family: Female (no spouse, with children	-0.170	0.000	0.000
Head: 25-55 years old	0.258	0.000	0.000
Head: 56+ years old	0.525	0.000	0.000
Head: Native, foreign parents	-0.013	0.000	0.000
Head: Naturalized American	-0.089	0.000	0.000
Head: Foreigner	-0.169	0.001	0.000
N. of children (below 16)	-0.140	0.000	0.000
N. of adults (16 or above)	0.003	0.000	0.000
Head: some secondary (9-12th grade)	0.050	0.001	0.000
Head: secondary education	0.142	0.001	0.000
Head: some college	0.187	0.001	0.000
Head: college	0.628	0.001	0.000
Other adults: % with secondary education	-0.088	0.000	0.000
Other adults: % with college	0.229	0.000	0.000
Head: not employed	-0.053	0.000	0.000
Head: weeks worked	0.001	0.000	0.000
Head: hours worked	0.010	0.000	0.000
Other adults: % employed*	0.327	0.000	0.000
Non-employed head with non labor income	0.109	0.000	0.000
Other non-employed adults: % with non labor income*	0.101	0.000	0.000
Intercept	0.480	0.001	0.000
N. of observations (persons)	158,011		
R^2	0.2096		
Prob > F	0		

Notes: Robust standard errors in parenthesis. Observations are all individuals with full information, clustered by family. 'Other adults' refers to: people other than the head, aged 16 or above who are not enrolled in further education. Benchmark person: a 15–24 years old single male, employed with only primary school education, living alone in a large city (5 million or more inhabitants) in the middle Atlantic region, born in the United States with American parents.
* The variable takes the value 0 when there are no other adults in the household.
Source: Own construction based on CPS, 2007

Table A2. Oaxaca-Blinder Income OLS regressions, Brazil

Dependent variable: household equivalized disposable income	**Coefficient**	**Std. Err.**	**P>z**
North	0.083	0.002	0.000
South-East	0.381	0.001	0.000
South	0.377	0.001	0.000
Center-West	0.589	0.001	0.000
Non urban village	-0.124	0.003	0.000
Urban, isolated	-0.371	0.004	0.000
Rural, agglomeration	-0.180	0.002	0.000
Rural, other	-0.292	0.001	0.000
Family: Male-headed married couple	0.288	0.001	0.000
Family: Male (no spouse)	0.137	0.001	0.000
Family: Female (no spouse, no children)	-0.336	0.001	0.000
Family: Female (no spouse, with children	-0.295	0.001	0.000
Head: 25-55 years old	0.541	0.002	0.000
Head: 56+ years old	1.437	0.002	0.000
Head: immigrant from the same State	0.055	0.001	0.000
Head: immigrant, other	0.201	0.001	0.000
N. of children (below 16)	-0.254	0.000	0.000
N. of adults (16 or above)	0.171	0.000	0.000
Head: 1 to 3 years of education	0.208	0.001	0.000
Head: 4 to 7 years of education	0.463	0.001	0.000
Head: 8 to 10 years of education	0.827	0.001	0.000
Head: 11 to 14 more years of education	1.527	0.001	0.000
Head: 15 or more years of education	5.210	0.001	0.000
Other adults: % with 8 to 10 years of education	-0.323	0.001	0.000
Other adults: % with 11 or more years of education	0.725	0.001	0.000
Head: not employed	-0.264	0.002	0.000
Head: hours worked	0.015	0.000	0.000
Other adults: % employed*	0.027	0.001	0.000
Non-employed head with non labor income	0.525	0.001	0.000
Other non-employed adults: % with non labor income*	-0.250	0.002	0.000
Intercept	-0.898	0.002	0.000
N. of observations (persons)	385,138		
R^2	0.2978		
Prob > F	0		

Notes: Robust standard errors in parenthesis. Observations are all individuals with full information, clustered by family. 'Other adults' refers to: people other than the head, aged 16 or above who are not enrolled in further education. Benchmark person: a 15–24 years old single male, employed with no schooling, living alone in a urban village in the North-East region, non migrant.

* The variable takes the value 0 when there are no other adults in the household.

Source: Own construction based on PNAD, 2007

Table A3. Oaxaca-Blinder Income OLS regressions, South Africa

Dependent variable: household equivalized disposable income	**Coefficient**	**Std. Err.**	**P>z**
Eastern Cape	-3.987	0.045	0.000
Northern Cape	-8.082	0.087	0.000
Free State	-5.804	0.049	0.000
KwaZulu-Natal	-3.539	0.043	0.000
North West	-4.717	0.048	0.000
Gauteng	-0.798	0.030	0.000
Mpumalanga	-3.609	0.057	0.000
Limpopo	-8.463	0.071	0.000
Urban area	-1.283	0.047	0.000
Family: Female-headed	-3.395	0.030	0.000
Head: 25-55 years old	4.809	0.066	0.000
Head: 56+ years old	7.258	0.067	0.000
N. of children (below 16)	-5.664	0.013	0.000
N. of adults (16 or above)	-3.098	0.012	0.000
Head: some primary	24.036	0.405	0.000
Head: complete primary	2.500	0.380	0.000
Head: secondary education	-0.812	0.184	0.000
Head: 12^{th} grade/Std 10/NTC III	1.949	0.184	0.000
Head: higher education	17.010	0.185	0.000
Other adults: % with some secondary education	-2.856	0.053	0.000
Other adults: % with 12^{th} grade/Std 10/NTC III or higher	0.966	0.047	0.000
Head: not employed	-1.699	0.071	0.000
Other adults: % employed*	8.748	0.049	0.000
Non-employed head with non labor income	-5.789	0.074	0.000
Other non-employed adults: % with non labor income*	-0.215	0.050	0.000
Intercept	21.191	0.195	0.000
N. of observations (persons)	82,637		
R^2	0.198		
Prob > F	0.000		

Notes: Robust standard errors in parenthesis. Observations are all individuals with full information, clustered by family. 'Other adults' refers to: people other than the head, aged 16 or above.
Benchmark person: a person living in a urban village in the Western-Cape region, within a household headed by a 15–24 years old male, employed with no schooling.
* The variable takes the value 0 when there are no other adults in the household.
Source: Own construction based on IES, 2005/06

Table A4. DiNardo-Fortin-Lemieux Logit regressions, US

Dependent variable: Race (White=1, Black=0)	**Coefficient**	**Std. Err.**	**P>z**
New England	0.689	0.087	0.000
East North Central	0.018	0.053	0.736
West North Central	0.561	0.071	0.000
South Atlantic	-0.858	0.050	0.000
East South Central	-0.888	0.065	0.000
West South Central	-0.540	0.059	0.000
Mountain	0.961	0.082	0.000
Pacific	0.513	0.065	0.000
Non metropolitan area	1.427	0.052	0.000
0.1-0.25 million inhabitants	1.008	0.068	0.000
0.25-0.5 million inhabitants	0.913	0.060	0.000
0.5-1 million inhabitants	0.757	0.060	0.000
1-2.5 million inhabitants	0.641	0.050	0.000
2.5-5 million inhabitants	0.124	0.050	0.014
Family: Male-headed married couple	-0.166	0.050	0.001
Family: Male (no spouse)	-0.916	0.052	0.000
Family: Female (no spouse, no children)	-1.179	0.051	0.000
Family: Female (no spouse, with children	-1.842	0.056	0.000
Head: 25-55 years old	-0.094	0.058	0.103
Head: 56+ years old	0.202	0.064	0.002
Head: Native, foreign parents	0.634	0.071	0.000
Head: Naturalized American	-0.750	0.070	0.000
Head: Foreigner	-0.836	0.082	0.000
N. of children (below 16)	-0.193	0.016	0.000
N. of adults (16 or above)	-0.166	0.017	0.000
Head: some secondary (9-12th grade)	0.110	0.081	0.176
Head: secondary education	0.534	0.075	0.000
Head: some college	0.610	0.079	0.000
Head: college	1.058	0.078	0.000
Other adults: % with secondary education	-0.153	0.057	0.007
Other adults: % with college	0.018	0.061	0.768
Head: not employed	-0.197	0.077	0.010
Head: weeks worked	-0.001	0.002	0.381
Head: hours worked	0.000	0.001	0.906
Other adults: % employed*	0.186	0.058	0.001
Non-employed head with non labor income	0.027	0.059	0.649
Other non-employed adults: % with non labor income*	0.122	0.060	0.043
Intercept	1.798	0.133	0.000
N. of observations (persons)	158,011		
Log pseudolikelihood	-58,419		
Pseudo R^2	0.178		
Wald chi2(37)	5,890	Prob > chi2	0.000

Notes: see notes Table A1

Table A5. DiNardo-Fortin-Lemieux Logit regressions, Brazil

Dependent variable: Race (White=1, Black=0)	**Coefficient**	**Std. Err.**	**P>z**
North	-0.241	0.021	0.000
South-East	0.996	0.016	0.000
South	2.025	0.021	0.000
Center-West	0.358	0.020	0.000
Non urban village	0.060	0.065	0.356
Urban, isolated	-0.219	0.087	0.012
Rural, agglomeration	-0.038	0.043	0.380
Rural, other	0.052	0.020	0.009
Family: Male-headed married couple	-0.210	0.023	0.000
Family: Male (no spouse)	-0.356	0.026	0.000
Family: Female (no spouse, no children)	-0.240	0.028	0.000
Family: Female (no spouse, with children	-0.211	0.018	0.000
Head: 25-55 years old	0.269	0.029	0.000
Head: 56+ years old	0.569	0.033	0.000
Head: immigrant from the same State	-0.020	0.015	0.173
Head: immigrant, other	-0.066	0.017	0.000
N. of children (below 16)	-0.148	0.006	0.000
N. of adults (16 or above)	-0.058	0.006	0.000
Head: 1 to 3 years of education	0.197	0.024	0.000
Head: 4 to 7 years of education	0.439	0.022	0.000
Head: 8 to 10 years of education	0.587	0.025	0.000
Head: 11 to 14 more years of education	0.919	0.024	0.000
Head: 15 or more years of education	1.742	0.033	0.000
Other adults: % with 8 to 10 years of education	0.001	0.023	0.966
Other adults: % with 11 or more years of education	0.443	0.029	0.000
Head: not employed	0.176	0.035	0.000
Head: hours worked	0.004	0.001	0.000
Other adults: % employed*	-0.103	0.023	0.000
Non-employed head with non labor income	0.089	0.031	0.004
Other non-employed adults: % with non labor income*	-0.076	0.034	0.024
Intercept	-1.375	0.046	0.000
N. of observations (persons)	385,138		
Log pseudolikelihood	-229,134		
Pseudo R^2	0.141		
Wald chi2(37)	21,975	Prob > chi2	0.000

Notes: see notes Table A2

Table A6. DiNardo-Fortin-Lemieux Logit regressions, South Africa

Dependent variable: Race (White=1, Black=0)	**Coefficient**	**Std. Err.**	**P>z**
Eastern Cape	-0.358	0.162	0.027
Northern Cape	-0.177	0.178	0.319
Free State	-0.120	0.177	0.500
KwaZulu-Natal	-0.622	0.181	0.001
North West	0.329	0.400	0.410
Gauteng	-0.203	0.141	0.152
Mpumalanga	-0.390	0.244	0.110
Limpopo	-0.632	0.238	0.008
Urban area	-1.204	0.188	0.000
Family: Female-headed	-0.533	0.105	0.000
Head: 25-55 years old	0.219	0.254	0.389
Head: 56+ years old	1.444	0.260	0.000
N. of children (below 16)	-0.475	0.064	0.000
N. of adults (16 or above)	-0.214	0.047	0.000
Head: some primary	-1.649	0.751	0.028
Head: complete primary	-0.538	0.723	0.457
Head: secondary education	2.790	0.476	0.000
Head: 12^{th} grade/Std 10/NTC III	4.193	0.485	0.000
Head: higher education	4.879	0.508	0.000
Other adults: % with some secondary education	0.942	0.146	0.000
Other adults: % with 12^{th} grade/Std 10/NTC III or higher	1.899	0.145	0.000
Head: not employed	-0.652	0.239	0.006
Other adults: % employed*	1.186	0.224	0.000
Non-employed head with non labor income	1.047	0.240	0.000
Other non-employed adults: % with non labor income*	0.769	0.200	0.000
Intercept	-6.004	0.621	0.000
N. of observations (persons)	82,637		
Log pseudolikelihood	-14,053		
Pseudo R^2	0.442		
Wald chi2(37)	1,253	Prob > chi2	0.000

Notes: see notes Table A3