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The Effect of Household Characteristics on Poverty and Living Standards in South Africa

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This paper uses panel data from South Africa to examine the effect of household characteristics on poverty and living standards and how they have changed over the five years following the dismantling of apartheid. I estimate the standard of living using two alternative methodologies. First, I use probit analysis to examine the poverty status of the household. Second I use quantile regressions to examine the standard of living of the household at different points on the income distribution. The main measure of the standard of living is per adult equivalent household income, which adjusts household income by the scale and composition adjusted household size. The estimation results show that the sex of the household head, the education attainment of the household head, ethnicity and region of residence have significant effects on both the poverty status and standard of living of the household.

I. Introduction

Notwithstanding its status as an upper-middle income country with a per capita income in excess of $3000, South Africa is characterised by enormous extent of poverty, inequality and material deprivation. The Human Development Index of the Whites in South Africa is between those of Italy and Israel while that of the Blacks is between those of Swaziland and Lesotho. Carter and May (1999) and Maitra and Ray (1999) compute the overall poverty rate in South Africa in 1993 to be more than 50%, and the poverty rate was significantly higher for the Black households compared to the Non-Black households. These results are corroborated by the findings of Klasen (1997, 2000) in his analysis of poverty and deprivation in South Africa. In the South African context, much of the differences in living standards among different segments of the population are the direct result of apartheid policies that denied equal access to education, employment, services and resources to the Non-White population of the country. During the apartheid era, every South African was classified as belonging to one of the following races: Black (or African), Coloured (or Mixed Race), Indian (or Asian) and White (or Caucasian). Apartheid was officially dismantled in 1994 following the election of Nelson Mandela as the president of South Africa. Following

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the dismantling of apartheid, such official policy of classifying individuals on the basis of race and skin colour no longer exists. However the legacy and history of the years of injustice is difficult to forget and is apparent in the form of wide divergences on the standard of living of the different segments of the population. The important question now is whether the dismantling of apartheid has resulted in improvements in living standards among the vast majority of South Africans. Using two comparable data sets, one from a survey conducted in 1993 just prior to the first democratic election in South Africa and one in 1998 this paper seeks to examine that question.

To examine this broad question of how standards of living have changed over the period 1993-1998, the first task is to evaluate the effects of various household characteristics on the standard of living of the household. The specific questions that I seek to examine in this paper are as follows. First, do female-headed households do worse than their male-headed counterparts? This is a question of significant policy concern particularly if, as has often been argued, women face significantly higher constraints to income earning opportunities. Estimation results show that in 1993 female-headed households were significantly worse off - poverty rates were significantly higher and living standards significantly lower for female-headed households relative to male-headed households. This leads to the obvious follow-up question. How has the gap between female and male-headed households changed over time - has the gap worsened or has the situation improved for the female-headed households relative to their male-headed counter parts? The data collected in 1998 allows examination of this issue. Second, do educated households perform better? Education and investment in human capital are universally recognized as essential components of economic development in any country. Education endows individuals with the means to enhance their skills, knowledge, health and productivity and also enhances the economy's ability to develop and adopt new technology for the purpose of economic and social development. Given these benefits from education, increasing education levels is an important concern for policy makers everywhere. Racially segregated education was a central pillar propping up the apartheid system in South Africa. The 1953 Bantu Education Act centralised the control of Black education and linked education expenditure on the Blacks to tax receipts from the Blacks. This resulted in a wide disparity in education expenditure among the different races. In 1989 for every Rand spent on a Black student, R2 was spent on a Coloured student, R3 on an Indian student and R4 on a White student. This however also resulted in very high premium to education among the Blacks. Mwabu and Schultz (2000) find that in 1993, the percentage wage gains associated with additional years of primary, secondary and post secondary education were substantially higher for the Blacks, compared to the Non-Blacks. As barriers to educational attainment and employment are dismantled in South Africa, wage differences between races are likely to decrease while the wage difference within races are likely to increase. The use of data from two different time periods and the use of quantile regressions allow examination of this issue. Third, because of the policies followed by the South African government during the apartheid era, Black households have generally performed significantly poorly compared to households belonging to the other races, specially the Indian and White households. Has the situation improved for the large majority of the Black households in the years following the end of apartheid? That is the third major question that I examine in this paper. Given data availability one is

however only able to examine the differences between the Black and Indian households.

For estimation purposes, I use a panel data set comprising of 1132 households residing in the Kwazulu-Natal province of South Africa. These households were first surveyed in 1993 as a part of the national South African Integrated Household Survey. In 1998, the Black and Indian households from the original (1993) sample who resided in Kwazulu-Natal were re-interviewed. The use of a panel data set allows one to track the same set of households over the period 1993. However the sample is not nationally representative and is not even representative of the population of Kwazulu-Natal in 1998.

The rest of the paper is examined as follows. Section II presents the Data, selected descriptive statistics and the estimation methodology. Section III discusses the results - first the results on poverty status (Section III.1) and then the results on standards of living (Section III.2). Section IV concludes.

II. Data, Selected Descriptive Statistics and Methodology

Two different data sets are used in this paper. I use the South Africa Integrated Household Survey (SIHS) 1993 data and the Kwazulu-Natal Income Dynamics Study (KIDS) 1998 data.

The SIHS data was obtained from a survey conducted jointly by the World Bank and the South Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town, as a part of the Living Standard Measurement Study (LSMS) in a number of developing countries. In South Africa the survey was conducted in the nine months preceding the historic 1994 elections. The main instrument used in this survey was a comprehensive household questionnaire covering a wide range of topics including demography, household services and expenditures, educational status and expenditure, remittances and marital maintenance, land access and use, employment and income, health status, expenditure and anthropometry. The data set is unique because it is the first survey that covers the entire South African population, including those in the predominantly Black "homelands".[1] The complete sample consists of approximately 9000 households drawn randomly from 360 clusters. The questionnaire and summary statistics are contained in SALDRU (1994).

Households in the SIHS data set that resided in the Kwazulu-Natal province were re-interviewed in 1998 for the Kwazulu-Natal Income Dynamics Study (KIDS). The KIDS data set is the outcome of a collaborative project between researchers at the University of Natal, University of Wisconsin-Madison and the International Food Policy Research Institute (IFPRI). Details of the KIDS data set may be obtained from May, Carter, Haddad and Maluccio (2000) and Maluccio, Haddad and May (2001). Kwazulu-Natal is the home of a fifth of the population of South Africa and was formed by combining the former Zulu Homeland and the province of Natal. 12% of the population of Kwazulu-Natal are Indians, 85% are Blacks and the remaining are of European descent (primarily British). The panel

1. The "homelands" were designated residential regions for the Blacks during the apartheid regime. These were typically autonomous states within South Africa.

data set that I use in this paper therefore comprises of households that were interviewed both in 1993 and in 1998. Households were re-interviewed over a three-month span stretching from March to June 1998. White households interviewed in Kwazulu-Natal in 1993 were few and clustered, and therefore the White households were eliminated from the new survey.[2] More than 80% of the original sample of Black and Indian households were successfully re-interviewed and in comparison with other panel data sets, given the length of time between the surveys and given the mobility of the South African population an attrition rate of less than 20% is extremely satisfactory. The final data set used for estimation purposes consists of 1132 households of whom 964 are Black and the remaining are Indians.

I measure the standard of living using two alternative methodologies. First, I use probit analysis to examine the poverty status of the household. Second I use quantile regressions to examine the standard of living of the household at different points on the income distribution. The main measure of the standard of living is per adult equivalent household income, which adjusts household income by the scale, and composition adjusted household size. The poverty line is also computed taking into account the scale and composition of the household.

The poverty line is computed as follows. Let Y denote the income of a particular household. Then the scale and composition adjusted (per adult equivalent) household income is

$$y^* = \frac{Y}{m(\boldsymbol{q}, \boldsymbol{j})},$$

where $m(\boldsymbol{q}, \boldsymbol{j})$ is the scale and composition adjusted household size:

$$m(\boldsymbol{q}, \boldsymbol{j}) = \left[n_a + \sum_{s=1}^{2} \sum_{d=1}^{2} \boldsymbol{q}_{ds} n_{ds} \right]^{\boldsymbol{j}}.$$

n_a is the number of adults in the household, n_{ds} is the number of children in age-group d of sex s in the household. The estimates of $\boldsymbol{q}$ and $\boldsymbol{j}$ were obtained from Ray (2000). The poverty dummy POV is defined as

$$POV = \begin{cases} 1, \text{ if the household is below the poverty line} \\ 0, \text{ otherwise} \end{cases},$$

Using estimates of $\boldsymbol{q}$ and $\boldsymbol{j}$, the poverty line was constructed as follows. The per capital poverty line OPL reported in Carter and May (1999) (OPL = Rand (R) 237) was multiplied by

2. There were no Coloured households in the original sample that resided in Kwazulu-Natal.

$$\overline{m} = \left[\overline{n}_a + \sum_{s=1}^{2} \sum_{d=1}^{2} \theta_{ds} \overline{n}_{ds} \right]^{1-\gamma} ,$$

where $\overline{n}_a$ is the average number of adults and $\overline{n}_{ds}$ is the average number of children of sex s in age group d. A household is considered poor if

$$y^* \leq \text{OPL} \leq \text{OPL}^* * \left[\overline{n}_a + \sum_{s=1}^{2} \sum_{d=1}^{2} \theta_{ds} \overline{n}_{ds} \right]^{1-\gamma}$$

and OPL was fixed at R237 a month. For 1998 the OPL was obtained by multiplying the OPL for 1993 by a factor that accounts for the rate of increase in the cost of living. The values of θ and γ are held constant over the two survey periods.

I estimate the probability of being poor by considering a probit estimation where the dependent variable is POV (as defined above). The poverty status depends on a set of household characteristics (including the race of the household) and region of residence. The explanatory variables included are the age (AGEHD), squared of the age (AGEHD2) and a dummy to indicate whether the household head is female (FHH) the highest level of education attained by the household head, which is measured by including three dummies: EDUCHD1, EDUCHD2, EDUCHD3.[3] I also include as explanatory variables the total number of children in the household (TOTCHILD), the total number of adults in the household (TOTADULT) and the total number of elderly in the household (TOTELDER). Individuals aged less than 18 years of age are categorised as children, males aged 18-64 and females aged 18-59 are categorised as adults and males aged 65 or higher and females aged 60 or higher are categorised as elderly. The definition follows the official definitions of the South African government. There is a social pension program in South Africa and every male aged 65 or higher (officially classified as elderly male) and every female aged 60 or higher (officially classified as elderly female) is eligible for social pension (subject to a means test). Note that both household size and composition are assumed to be exogenous. Edmonds, Mammen and Miller (2001) and Maitra and Ray (2001) argue that in the context of South Africa household composition cannot be regarded as necessarily being exogenous. While these are important issues they are ignored in the context of this paper. To account for the race of the household I include a race dummy (BLACK). Since standards of living vary significantly across regions, I also include dummy for rural residence (RURAL). This region of residence is of particular importance in the South Africa since movement and ownership of assets was restricted for the Non-Whites during the apartheid era.

I estimate changes in living standards from 1993 to 1998 by using quantile regressions

3. EDUCHD1 takes a value of one if the highest level of education attained by the household head is primary school, EDUCHD2 takes a value of one if the highest level of education attained by the household head is more than primary school but less than secondary school and EDUCHD3 takes a value of one if the highest level of education attained by the household head is more than secondary school. The reference dummy is that the household head has no education.

(see Koenker and Bassett (1978), Buchinsky (1998) and Deaton (1997)). The use of quantile regressions allows one to examine whether the relationship between a particular explanatory variable and household income affected by the position of the household on the income distribution. Ordinary least square regressions impose the constraint that the effect of a particular explanatory variable is the same for the different income groups thereby estimating at the mean. The quantile regressions on the other hand allow the determinants of living standards to vary between the different income groups. Moreover the use of quantile regressions allows us to better account for heteroskedasticity in the data. The advantages of using quantile regressions over OLS are wonderfully described by Deaton (1997), pages 78-85.

Quantile regressions can be best explained by illustrating the median regression where the estimates are obtained by minimising the absolute sum of error (rather than minimising the sum of squares of errors as in OLS estimation). It is also known as the Least Absolute Deviation or LAD estimator. The median regression coefficients are obtained by minimising $\boldsymbol{x}$ where

$$\boldsymbol{x} = \sum_i \left| y_i - X_i'\boldsymbol{b} \right| = \sum_i (y_i - X_i'\boldsymbol{b}) \operatorname{sgn}(y_i - X_i'\boldsymbol{b})$$

and $\operatorname{sgn}(a) = 1$ if $a > 0$ and $\operatorname{sgn}(a) = -1$ if $a \le 0$. So, the first order condition for this problem is given by:

$$\sum_{i=1}^{n} X_{ij} \operatorname{sgn}(y_i - X_i'\boldsymbol{b}) = 0; j = 1, \ldots, k .$$

Quantile regressions other than the median can be defined by minimising:

$$\boldsymbol{x}_q = -(1-q) \sum_{y_i \le X_i'\boldsymbol{b}} (y_i - X_i'\boldsymbol{b}) + q \sum_{y_i > X_i'\boldsymbol{b}} (y_i - X_i'\boldsymbol{b})$$

which is equivalent to the median regression if $q = 0.5$. I conduct 5 quantile regressions at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles. The quantiles are estimated simultaneously. The standard errors are computed by bootstrapping with 100 replications. I also estimated the quantiles individually. The coefficients were identical but the standard errors were slightly different. Overall however the results were similar.

Since it is often of interest to examine how the effect of the explanatory variables change as one moves from one quantile to the other I also conduct a set of inter-quantile regressions. Consider a quantile regression model where the p^{th} and the q^{th} quantiles are given by

$$Q_p(y) = \boldsymbol{a}_p + \boldsymbol{b}_{1p} x_1 + \boldsymbol{b}_{2p} x_2 + \boldsymbol{e}_p ,$$

$$Q_q(y) = \boldsymbol{a}_q + \boldsymbol{b}_{1q} x_1 + \boldsymbol{b}_{2q} x_2 + \boldsymbol{e}_q .$$

The difference in quantiles is then given by

$$Q_p(y) - Q_q(y) = (\alpha_p - \alpha_q) + (\beta_{1p} - \beta_{1q})x_1 + (\beta_{2p} - \beta_{2q})x_2 + (\varepsilon_p - \varepsilon_q) .$$

The estimated coefficients denote inter-quantile differences in living standards. Once again the standard errors are obtained by bootstrapping, with 100 replications.

Quantile regressions have often been used to estimate the wage premium of years of schooling (in the labour literature - see Buchinsky (1998)). In the context of South Africa, Thomas (1996) has used quantile regressions to estimate the returns to education by race and Mwabu and Schultz (1996, 2000) use quantile regressions to estimate education returns across quantiles of the wage function. Anderson and Pomfret (2000) use quantile regressions to estimate changes in living standards in the Kyrgyz Republic over the period 1993-1996 (during transition to the market economy).

Table 1 presents selected descriptive statistics for the SIHS 1993 and the KIDS 1998 data sets respectively. Notice that compared to 1993, the poverty rates are actually slightly higher in 1998 overall and this is partly due to the increase in the extent of poverty among the Indian households. What is interesting is that average per adult equivalent income has increased for all households and separately for both the Black and the Indian households over the period 1993-1998. This could imply that the distribution of income has worsened over the period. However one must note that neither the 1993 nor the 1998 poverty rates are representative of the poverty rate for the whole of South Africa, the latter are not even representative of the poverty rate in Kwazulu-Natal in 1998. This stems from the fact that the re-interviewed households did not constitute a representative sample of the population residing in Kwazulu-Natal province in 1998. Overall and separately for Black and Indian households, the number of female headed households has increased from 1993 to 1998. Finally, it is also worth noting that overall and separately for the Black and Indian households, the number of households where the household head has no education has decreased in the years following the end of apartheid. Table 1 also presents per adult equivalent income at the 5 quantiles. Note that compared to 1993, per adult equivalent income is higher at every quantile, both for Black and Indian households.[4]

III. Results

1. Probability of Being Poor

Tables 2 and 3 present the probit results for the poverty status of the household. I present the estimates for both the year specific regressions (Table 2) and also for regressions on the pooled data (Table 3). The dependent variable POV is a zero-one dummy that takes a value one if the household is poor.

4. In 1993 the official exchange rate was $1 US = R3.5. In 1998 the exchange rate was $1 US = R6.

Table 2 Marginal Probit Coefficients for 1993 and 1998 (All Households)

	1993	1998
AGEHD	–0.0023	–0.0021
	(–0.86)	(–1.92)
AGEHD2	–5.80E–06	–1.52E–05
	(–0.23)	(–1.49)
FHH	0.0341	0.0328
	(2.07)	(1.76)
EDUCHD1	–0.0941	–0.0641
	(–3.71)	(–1.93)
EDUCHD2	–0.1715	–0.1819
	(–5.09)	(–4.27)
EDUCHD3	–0.7406	–0.6827
	(–6.92)	(–7.39)
TOTCHILD	0.0380	0.0336
	(6.17)	(6.40)
TOTADULT	0.0273	0.0076
	(4.78)	(1.48)
TOTELDER	0.0151	0.0291
	(0.86)	(1.85)
BLACK	0.2069	0.0996
	(4.59)	(2.40)
RURAL	0.0885	0.1095
	(4.62)	(4.72)
OBS. P	0.8101	0.8171
PRED. P	0.9306	0.9066
N	1132	1132
Wald χ^2	239.32	214.49
Prob > χ^2	0.0000	0.0000
Pseudo R^2	0.4087	0.3327
Log Likelihood	–325.4089	–359.3628

Notes: Robust *t*-values in parenthesis.

Table 3 Random Effect Probit Coefficients for the Panel Data (All Households)

AGEHD	–0.0149
	(–2.15)
AGEHD2	–0.0001
	(–1.12)
FHH	0.2415
	(2.19)
EDUCHD1	–0.5640
	(–3.63)
EDUCHD2	–1.0418
	(–6.01)
EDUCHD3	–2.5077
	(–8.94)
TOTCHILD	0.2740
	(8.85)
TOTADULT	0.1013
	(3.77)
TOTELDER	0.1267
	(1.39)
BLACK	0.8662
	(4.48)
RURAL	0.7154
	(5.89)
CONSTANT	0.4604
	(1.35)
N	2264
Wald χ^2	221.39
Prob > χ^2	0.0000
Log Likelihood	–691.8081
$\chi^2 : r = 0$	14.39*

Notes: Robust *t*-values in parenthesis.

* Significant at 1% level.

Table 2 presents the marginal effects for the year specific regressions on the poverty status of the household. I present the marginal effects and not the coefficient estimates as the former are more easily interpreted. The results are quite illuminating. Both in 1993 and in 1998, female-headed households were more likely to be poor, and interestingly the effect of the sex of the head of the head of the household on the poverty status is not particularly different in the two years. In 1993, relative to Indian households, Black households were 20.7% more likely to be poor and this probability has decreased to 10% in 1998. This sharp decline in the differences in poverty rate for Black and Indian households over the period 1993-1998 is due to the combination of two factors. First, poverty rates have risen among the

Indian households in the sample and second, they have fallen in the Black households. The highest level of education attained by the household head has a significant effect on the poverty status of the household, both in 1993 and in 1998. Relative to households where the household head has no education, households where the household head has primary schooling as the highest level of education attained (EDUCHD1), more than primary but less than secondary schooling as the highest level of education attained (EDUCHD2) and more than secondary schooling as the highest level of education attained (EDUCHD3) had respectively 9.4%, 17.15% and 74% lower probability of being poor in 1993. The corresponding probabilities were 6.4%, 18.2% and 68% in 1998. Notice that it appears that the premium on education has declined at the two extremes, the decline being particularly severe for households where the highest level of education of the household head is primary school. However the premium on education has increased significantly for households where the household head has more than primary but less than secondary schooling. It might be argued that the education level of the household head might not capture the whole story. I therefore re-estimate the model using the years of education of the most educated male and female member of the household. The results show that a year increase in the years of completed schooling (of both men and women) significantly reduces the probability that the household is poor. In 1993 a year increase in the years of schooling of the most educated male reduces the probability that the household is poor by 3.7%, while a year increase in the years of schooling of the most educated female reduces the probability that the household is poor by 1.6%. In 1998, the corresponding probabilities are 3.0% and 4.1%. There is a significantly stronger effect of female education on the poverty status of the household during the period 1993-1998. Finally it is worth noting that both in 1993 and in 1998, the probability of being poor is significantly higher for households residing in rural regions and more importantly the probability of a rural household being poor has actually increased (slightly) over the period 1993-1998.

Table 3 presents the random effect probit estimates.[5] The likelihood ratio test for the significance of the panel variance $\rho = \frac{\sigma_v^2}{\sigma_v^2 + 1}$, where σ_v^2 is the panel variance component, shows that the null hypothesis of $\rho = 0$ is rejected. Therefore the panel aspect of the data is important. There are a few results that are really worth noting. First, female-headed households are more likely to be poor. Second, the highest level of education attained by the household head significantly reduces the probability that the household is poor. When I re-estimate the regression using the years of schooling of the most educated male and female member of the household instead of the highest education of the household head, we find that overall an increase in the number of years of schooling of the most educated member of the household results in a significant reduction in the probability that the household is poor and the effect is stronger for females. Third, Black households are more likely to be poor compared to Indian households. The total number of children in the household increases the probability that the household is poor. The probability of being poor is significantly higher for households residing in rural regions.

5. Note that in this case I present the probit coefficients rather than the marginal effects.

2. Estimates from the Quantile Regressions

I now turn to the quantile regression estimates for per adult equivalent income and expenditure. The regression estimates at the 10^{th} (q10), 25^{th} (q25), 50^{th} (q50), 75^{th} (q75) and 90^{th} (q90) quantiles are conducted. As a point of comparison I also present the OLS estimates for per adult equivalent income for 1993 and 1998 and the random effect regression estimates for the pooled data.

The OLS estimates for 1993 and 1998 presented in Table 4 show the following.

Table 4 OLS and Random Effects Estimates for Per Adult Equivalent Income (All Households)

	OLS – 1993	OLS – 1998	Random Effects
AGEHD	4.8965	8.0057	2.9312
	(0.86)	(1.26)	(0.69)
AGEHD2	–0.0246	0.0709	0.0511
	(–0.53)	(0.93)	(1.24)
FHH	–69.5143	–135.6882	–78.6071
	(–2.87)	(–1.55)	(–1.28)
EDUCHD1	59.1468	87.7826	75.1637
	(3.22)	(1.32)	(1.04)
EDUCHD2	97.7169	378.6520	267.9312
	(2.44)	(3.11)	(3.04)
EDUCHD3	682.1539	1797.7140	1318.0810
	(5.16)	(2.15)	(8.10)
TOTCHILD	–35.1099	–54.1825	–45.7177
	(–7.45)	(–3.48)	(–3.82)
TOTADULT	–24.9644	–2.6481	2.1230
	(–3.05)	(–0.16)	(0.15)
TOTELDER	14.6631	–142.9274	–60.7911
	(0.69)	(–2.36)	(–1.19)
BLACK	–540.2777	–281.4944	–420.3536
	(–3.50)	(–1.23)	(–3.45)
RURAL	–125.1526	–225.5194	–169.6355
	(–5.69)	(–2.19)	(–2.37)
CONSTANT	860.1005	412.2341	662.8304
	(5.36)	(1.45)	(3.24)
N	1132	1132	2264
F	27.30	9.00	224.86^{+}
Prob > F	0.0000	0.0000	0.0000^{++}
Hausman χ^2	-	-	17.11^{**}

Notes: Robust *t*-values in parenthesis.

$^{+}$ Wald χ^2, $^{++}$ Prob > χ^2, ** Significant at 5% level.

First, in 1993, per adult equivalent household income is significantly lower for female-headed households. Interestingly note that the coefficient estimate of FHH is lower in 1998 compared to 1993, (though the estimate is not statistically significant in 1998). It could therefore be argued that female-headed households are actually worse off in 1998 compared to 1993. The per adult equivalent household income is significantly lower for Black households relative to Indian households in 1993 but not in 1998, though even in 1998, the coefficient estimate of BLACK is negative. Further, the coefficient estimate of BLACK is higher in 1998 compared to 1993. These results imply that at the average, Black households have performed better compared to Indian households over the period 1993-1998. The highest education attained by the household head is always positive and statistically significant. Moreover as the OLS results show, the effect is significantly stronger in 1998 compared to 1993. An increase in the total number of children in the household reduces per adult equivalent income both in 1993 and in 1998, though the effect is significantly stronger in 1998.

The random effect regression estimates, also presented in Table 3 essentially show the same results and I will not discuss these results in detail. The standard Hausman Test chooses the Random Effects regression over the Fixed Effects regression.

I now turn to the quantile regression estimates. Table 5 presents the estimates for both 1993 and for 1998 for all households in the sample. The regression estimates at the 10^{th} (q10), 25^{th} (q25), 50^{th} (q50), 75^{th} (q75) and 90^{th} (q90) quantiles are conducted. The quantiles are estimated simultaneously. The standard errors are computed by bootstrapping with 100 replications. To examine the robustness of the results, I re-estimated the quantiles individually. The coefficients were identical but the standard errors were slightly different: overall the results were similar and are therefore not presented.

The coefficient of FHH is always negative and is always significant for both the 1993 and the 1998 samples. Female-headed households are therefore always worse off compared to male-headed households. For example, at the median (q50) per adult equivalent household income is lower for a female-headed household by R43.31 in 1993 and R57.64 in 1998. Interestingly the gap between male and female-headed households has decreased over the period 1993-1998 for households at the two extremes (q10 and q90) but has increased elsewhere.

The coefficient estimates for the highest level of education attained by the household head are interesting. The premium on education is higher in 1998 compared to 1993 if the household head has less than secondary schooling (the highest education attained by the household head is primary schooling and the highest education attained by the household head is more than primary but less than secondary schooling - EDUCHD1 and EDUCHD2 respectively). The premium on education is actually lower in 1998 compared to 1993 if the highest level of education attained by the household head is more than secondary schooling (EDUCHD3). For example, in 1993 for the median household, compared to households where the head has no education the per adult equivalent household income is higher by R29.5 if the highest education attained by the household head is primary school (EDUCHD1), is higher by R79.6 if the highest education attained by the household head is more than primary but less than secondary school (EDUCHD2) and is higher by R771 if the highest education attained is secondary school or higher (EDUCHD3).

In 1998, the corresponding premia on education were R30, R127.8 and R683. The premium on education has increased by 2.7% and 60.6% if the highest education of the household head is primary school and more than primary but less than secondary school respectively. On the other hand the premium on schooling has actually decreased by 11.4% if the highest education attained by the household head is more than secondary school. The premium on education (irrespective of the highest level of education attained by the household head) increases as we move up the quantiles. This implies that the premium on education is higher for households at the higher end of the distribution.

Not surprisingly the race of the household has a significant effect on the standard of living. In 1993, relative to an Indian household, at the median per adult equivalent household income was lower for a Black household by R300.74 and this figure fell to R623 at the 90th quantile. By 1998, the difference between the Black and Indian households appear to have increased at all quantiles (the only exception is the 25th quantile but even in this case the difference is very small) - down to R367 at the median and to R980 at the 90th quantile. Examining the OLS estimates does not capture this aspect - actually the OLS estimates portray a different picture, showing that the difference between the races has actually decreased over the period 1993-1998.

The presence of an additional child in the household reduces per adult equivalent household income in each of the five quantiles both in 1993 and in 1998, but interestingly the effect is lower in 1998 compared to 1993. The presence of an additional elderly or an additional adult in the household has very little effect on the standard of living (as measured by the per adult equivalent household income). Finally households residing in rural regions are worse off at every quantile both in 1993 and in 1998. More over it is worth noting that per adult equivalent income is actually lower for rural households in 1998 compared to 1993 at all but the 90th quantile.

A good way of examining how the effect of the different variables change as one moves along the income distribution is obtained by the inter-quantile differences. Table 6 presents the inter-quantile regressions for 1993 and 1998. The following observations are worth noting. First, for both 1993 and 1998, the sex of the household head has very little effect on the inter-quantile differences in living standards. The highest level of education attained by the household head generally has a significant effect on inter-quantile differences, as does the race of the household. Note that the education dummies (irrespective of the highest level of education attained by the household head) are not statistically significant in explaining interquantile difference at the upper end of the distribution (q90 - q75).

Table 7 presents the quantile regression estimates for Black households only in 1993 and 1998. The coefficient of FHH is negative and statistically significant at every quantile, both in 1993 and in 1998. Moreover the coefficient of FHH decreases as one moves up the distribution. In 1993, per adult equivalent income is lower for female-headed households by R29, R36, R43, R64 and R107 at the 10th, 25th, 50th, 75th and the 90th quantile respectively. In 1998, per adult equivalent income is lower for female-headed households by R24, R41, R57, R84 and R101 at the 10th, 25th, 50th, 75th and the 90th quantile respectively. Therefore compared to 1993, in 1998the effect of FHH is actually weaker at the two extremes.

The premium on education is higher in 1998 compared to 1993 at every quantile with one exception - per adult equivalent income is lower in 1998 compared to 1993 at the 10^{th} quantile if the highest education attained by the household head is more than secondary school. Finally the coefficient estimate of RURAL is always negative and statistically significant.

So far I have used per adult equivalent household income as the measure of the standard of living. As an alternative and also to examine the robustness of the results, I re-estimate using the log of per adult equivalent income as the relevant measure of the standard of living. The estimated coefficients are presented in Table 8. In this case the coefficient estimates of the dummy explanatory variables can be interpreted in terms of percentage change, relative to the reference category. For example a coefficient estimate of –0.4696 associated with FHH at the 10^{th} quantile in 1993 implies that relative to male-headed households per adult equivalent income is lower for female-headed households by 46.96%. The following results are worth noting.

1. Per adult equivalent income is significantly lower for female-households relative to male-headed households. The coefficient estimates imply that the gap between male and female-headed households is lower at the upper end of the distribution compared to that in the upper end of the distribution. Interestingly the gap between male and female-headed households has actually widened over the period 1993-1998 for households at the upper end of the distribution but has narrowed for households at the lower end of the distribution.

2. Both in 1993 and in 1998, Black households are worse off compared to Indian households. The estimated coefficients imply that in 1993, relative to Indian households, per adult equivalent income is lower for Black households by 65.7%, 62.5%, 61.7%, 58% and 64.3% at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and the 90^{th} quantile respectively. The corresponding figures for 1998 are 51.4%, 64.2%, 53.3%, 69.3% and 54.1%.

3. Rural households are significantly worse off compared to urban (and metropolitan households) the condition of rural households have generally worsened in 1998 compared to 1993 - the only exception is for households at the 90^{th} quantile.

4. Per adult equivalent income is always higher for households where the head is educated, relative to households where the head has no education. Moreover the higher the education level of the household head, the greater is the premium on education. For example for the median household in 1993, relative to households where the head has no education, per adult equivalent income is higher by 20.74% if the highest education attained by the household head is some primary school, is higher by 50.08% if the highest education attained by the household head is more than primary but less than secondary schooling and is higher by 146.68% if the highest education attained by the household head is more than secondary schooling. The corresponding figures for 1998 are 18.45%, 67.82% and 132.45%. Interestingly,

the premium to primary schooling is not statistically significant for households at the 10th quantile. Also note that while the premium on education has always increased over the period 1993-1998 for households where the head has more than primary but less than secondary schooling, the premium to post secondary schooling is generally lower in 1998 compared to 1993 (the only exception being households at the 90th quantile). The coefficient estimates show that in 1993, relative to households where the head has no education, per adult equivalent income is higher by 192%, 163%, 147%, 142% and 105% at the 10th, 25th, 50th, 75th and 90th quantile respectively. The corresponding figures for 1998 are 136%, 143%, 132%, 125% and 123%.

The regression results show that the sex of the household head, the educational attainment of the household head, ethnicity and the region of residence all have significant effects on living standards of the South African households. The results obtained in this paper are similar to those obtained from both South Africa and elsewhere. Klasen (2000) uses data from South Africa (the national level SIHS 1993 data set) to examine the effect of household characteristics on poverty and deprivation. He finds that rural residents, Blacks, female-headed households and poorly educated families are more likely to be poor and deprived. He argues that while some of the results are likely to be specific to South Africa and the legacy of apartheid, many of the results are likely to generalize to other developing countries. Glewwe (1991) uses data from Cote d' Ivoire and finds similar rural-urban and ethnic differences in welfare. Anderson and Pomfret (2000) use data from the Kyrgyz Republic to analyse changes in the determinants of household expenditure during the period of transition (1993-1996). They apply a quantile regression to a human capital model and find that region of residence, ethnicity and family size are all significant determinants of household expenditure and the standard of living.

IV. Conclusion

This paper uses two comparable data sets from South Africa to examine how poverty and living standards have changed over the five years (1993-1998) following the dismantling of apartheid. I examine the effect of household characteristics on the poverty status using probit estimation and estimate the effect of household characteristics on living standards (measured by per equivalent adult household income) by using quantile regressions. The use of the panel data set allows one to track the behaviour of the same households over the five year period following the end of apartheid, a period when South Africa has undergone massive changes. This paper therefore contributes significantly to our understanding of how households have fared during this period. However one must remember that this is neither a national sample nor is it a nationally representative sample Therefore the neither the 1993 nor the 1998 poverty rates are representative of the poverty rate for the whole of South Africa, the latter are not even representative of Kwazulu-Natal poverty in 1998. This stems from the fact that the re-interviewed households did not constitute a representative sample of the population residing in Kwazulu-Natal province in 1998. However these are data constraints and our understanding of the problems facing South Africa will be enhanced if we bear this in mind.

It is worth summarising some of the main results of this paper. First, female-headed households are significantly worse off compared to male-headed households. This is true at all points on the distribution and over the period 1993-1998. Second, Black households are significantly worse off compared to Indian households and it also appears that relative to Indian households the condition of Black households has actually worsened over the period 1993-1998. Third, rural households are worse off compared to urban and metropolitan households, and interestingly except at the 90^{th} quantile, the condition of rural households had actually worsened over the period 1993-1998. Finally, the premium on education is higher in 1998 compared to 1993 if the household head has less than secondary schooling (the highest education attained by the household head is primary schooling and the highest education attained by the household head is more than primary but less than secondary schooling - EDUCHD1 and EDUCHD2 respectively). The premium on education is actually lower in 1998 compared to 1993 if the highest level of education attained by the household head is more than secondary schooling (EDUCHD3). The premium on education (irrespective of the highest level of education attained by the household head) increases as we move up the quantiles.

In South Africa much of the differences in living standards among different segments of the population are the direct result of apartheid policies that denied equal access to education, employment, services and resources to the Non-White population of the country. Following the dismantling of apartheid, such official policy of classifying individuals on the basis of race and skin colour no longer exists. However the legacy and history of the years of injustice is difficult to forget and is apparent in the form of wide divergences on the standard of living of the different segments of the population. While much has been achieved in the five years following the dismantling of apartheid, a great deal more needs to be done to achieve social and economic equality among the different segments of the South African population.

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Table 1 Selected Sample Means, 1993 and 1998 by Race

	All Households		Black Households		Indian Households	
	1993	1998	1993	1998	1993	1998
Sample Size	1132	1132	964	964	168	168
Per Adult Equivalent Income	347.022	537.697	236.584	397.810	980.723	1340.379
Per Adult Equivalent Income at 10^{th} Quantile	48.23	73.74	44.57	65.66	166.00	273.78
Per Adult Equivalent Income at 25^{th} Quantile	99.48	131.27	88.31	119.31	367.52	461.88
Per Adult Equivalent Income at 50^{th} Quantile	182.49	242.51	155.14	207.92	581.91	780.21
Per Adult Equivalent Income at 75^{th} Quantile	371.13	502.58	265.54	382.49	1157.86	1516.23
Per Adult Equivalent Income at 90^{th} Quantile	766.42	1094.77	511.15	714.58	1751.91	2219.62
POV (= 1 if Poor)	0.810	0.817	0.886	0.886	0.375	0.423
AGEHD (Age of Household Head)	50.918	53.452	51.929	54.257	45.113	48.833
FHH (= 1 if household head is Female)	0.313	0.389	0.340	0.422	0.155	0.196
EDUCHD1 (= 1 if the highest education attained by the household head is primary school)	0.392	0.390	0.437	0.432	0.137	0.155
EDUCHD2 (= 1 if the highest level of education attained by the household head is more than primary school but less than secondary school)	0.288	0.323	0.216	0.271	0.702	0.625
EDUCHD3 (= 1 if the highest level of education attained by the household head is more than secondary school)	0.031	0.045	0.016	0.021	0.119	0.185
TOTCHILD (Total Number of Children)	3.178	3.777	3.429	4.163	1.732	1.565
TOTADULT (Total Number of Working Age Adults^{+})	3.384	4.726	3.508	4.897	2.673	3.744
TOTELDER (Total Number of Elderly^{++})	0.406	0.578	0.444	0.626	0.190	0.304

Notes: $^{+}$ Males aged 18-64 and Females aged 18-59. $^{++}$ Males aged 65 and above and Females aged 60 and above.

Table 5 Quantile Regression Estimates for 1993 and 1998 (All Households)

	q10		q25		q50		q75		q90	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
AGEHD	1.3254	0.3436	−0.5437	0.6667	0.6045	0.6374	−3.5268	1.1321	−8.1170	1.3044
	(0.70)	(0.49)	(−0.45)	(1.45)	(0.29)	(0.60)	(−0.79)	(0.63)	(−0.88)	(0.49)
AGEHD2	−0.0016	0.0214	0.0088	0.0214	0.0006	0.0311	0.0325	0.0416	0.1108	0.0613
	(−0.10)	(3.27)	(0.78)	(4.33)	(0.03)	(3.04)	(0.73)	(2.41)	(1.23)	(2.42)
FHH	−27.4816	−22.6501	−31.1364	−37.7724	−43.3116	−57.6429	−56.8318	−75.3244	−101.9199	−89.6951
	(−3.58)	(−2.60)	(−4.17)	(−3.90)	(−6.09)	(−4.23)	(−3.43)	(−3.23)	(−3.17)	(−1.85)
EDUCHD1	4.8186	14.3915	9.9279	17.2745	29.5473	30.3359	62.7689	76.7879	119.3368	128.2024
	(0.63)	(1.63)	(1.22)	(1.77)	(3.49)	(2.12)	(4.61)	(2.94)	(2.84)	(2.68)
EDUCHD2	35.7246	47.7046	47.7327	71.1666	79.5771	127.7830	121.1704	311.2767	124.8024	430.0181
	(2.35)	(2.97)	(4.28)	(4.60)	(5.15)	(4.84)	(4.10)	(5.55)	(2.03)	(4.70)
EDUCHD3	307.0370	226.5359	497.5082	398.5254	771.1174	683.3749	1027.7000	993.8763	936.9436	864.5308
	(2.83)	(1.93)	(3.62)	(4.28)	(5.82)	(5.16)	(4.51)	(4.85)	(2.38)	(0.46)
TOTCHILD	−7.3510	−7.2022	−10.8222	−10.1738	−18.5777	−14.8278	−25.2838	−14.3225	−36.4785	−26.6513
	(−3.04)	(−4.66)	(−6.49)	(−5.02)	(−7.91)	(−5.78)	(−7.21)	(−3.44)	(−5.16)	(−3.24)
TOTADULT	−1.4655	−2.4288	−4.0342	−4.7904	−4.6880	−6.1884	−5.9063	−13.8510	−14.8689	−4.7161
	(−0.61)	(−0.99)	(−2.01)	(−2.57)	(−1.88)	(−2.18)	(−1.65)	(−2.59)	(−1.68)	(−0.40)
TOTELDER	16.2218	2.0501	28.9911	1.6567	34.0738	−8.6546	49.6022	−20.1434	27.7202	−79.9824
	(1.70)	(0.24)	(4.63)	(0.23)	(4.04)	(−0.84)	(3.24)	(−0.99)	(0.70)	(−2.46)
BLACK	−91.9970	−138.7805	−199.4113	−190.7792	−300.7336	−367.7440	−406.0781	−659.6421	−623.3284	−981.0570
	(−1.95)	(−3.49)	(−6.26)	(−4.68)	(−7.42)	(−5.17)	(−2.90)	(−5.40)	(−3.72)	(−4.39)
RURAL	−23.3041	−59.7723	−43.3563	−95.1333	−52.4756	−113.5844	−116.5492	−183.7396	−410.8926	−331.2979
	(−1.94)	(−5.09)	(−4.64)	(−6.31)	(−4.09)	(−5.16)	(−3.24)	(−3.20)	(−4.71)	(−4.04)
CONSTANT	125.8237	218.0584	376.4915	361.4237	526.3721	626.1481	905.2265	1037.3140	1649.5580	1642.2810
	(1.57)	(4.34)	(8.30)	(8.35)	(7.96)	(8.31)	(4.77)	(7.77)	(5.94)	(6.20)
N	1132	1132	1132	1132	1132	1132	1132	1132	1132	1132

Pseudo R^2	0.0717	0.0834	0.1523	0.1258	0.2282	0.1750	0.2872	0.2162	0.3356	0.2178

Notes: Boot Strapped Standard Errors with 100 replications. *t*-values in parenthesis.

Table 6 Interquantile Regressions for 1993 and 1998 (All Households)

	q25 – q10		q50 – q25		q75 – q50		q90 – q75	
	1993	1998	1993	1998	1993	1998	1993	1998
AGEHD	−1.8690	0.3231	1.1481	−0.0292	−4.1313	0.4946	−4.5902	0.1724
	(−1.18)	(0.58)	(0.57)	(−0.04)	(−1.06)	(0.40)	(−0.59)	(0.08)
AGEHD2	0.0104	0.0000	−0.0082	0.0097	0.0319	0.0105	0.0783	0.0198
	(0.82)	(0.00)	(−0.47)	(1.28)	(0.85)	(0.82)	(0.97)	(0.91)
FHH	−3.6548	−15.1222	−12.1751	−19.8706	−13.5202	−17.6815	−45.0882	−14.3707
	(−0.47)	(−1.72)	(−1.52)	(−1.77)	(−0.94)	(−0.83)	(−1.62)	(−0.33)
EDUCHD1	5.1093	2.8829	19.6194	13.0614	33.2217	46.4520	56.5679	51.4146
	(0.69)	(0.28)	(2.44)	(1.04)	(2.45)	(2.09)	(1.49)	(1.28)
EDUCHD2	12.0081	23.4620	31.8445	56.6165	41.5934	183.4936	3.6320	118.7414
	(0.83)	(1.43)	(2.34)	(2.96)	(1.62)	(3.69)	(0.07)	(1.55)
EDUCHD3	190.4712	171.9895	273.6092	284.8495	256.5828	310.5014	−90.7566	−129.3455
	(1.67)	(1.68)	(2.45)	(2.81)	(1.56)	(1.64)	(−0.24)	(−0.04)
TOTCHILD	−3.4712	−2.9716	−7.7554	−4.6540	−6.7061	0.5053	−11.1948	−12.3288
	(−1.62)	(−1.62)	(−3.94)	(−2.03)	(−2.42)	(0.16)	(−2.04)	(−1.67)
TOTADULT	−2.5687	−2.3615	−0.6538	−1.3981	−1.2182	−7.6626	−8.9627	9.1349
	(−1.16)	(−1.05)	(−0.26)	(−0.51)	(−0.32)	(−1.68)	(−1.17)	(0.97)
TOTELDER	12.7692	−0.3934	5.0827	−10.3113	15.5284	−11.4888	−21.8819	−59.8390
	(1.50)	(−0.05)	(0.70)	(−1.33)	(1.28)	(−0.74)	(−0.58)	(−2.64)
BLACK	−107.4143	−51.9988	−101.3223	−176.9647	−105.3445	−291.8981	−217.2503	−321.4150
	(−2.15)	(−1.37)	(−2.61)	(−2.98)	(−0.87)	(−3.16)	(−1.22)	(−1.69)
RURAL	−20.0522	−35.3610	−9.1193	−18.4511	−64.0737	−70.1552	−294.3434	−147.5583
	(−1.83)	(−2.54)	(−0.83)	(−1.19)	(−1.60)	(−1.64)	(−3.48)	(−2.22)
CONSTANT	250.6678	143.3653	149.8806	264.7244	378.8544	411.1658	744.3312	604.9670
	(3.47)	(3.17)	(2.19)	(3.84)	(2.62)	(3.87)	(2.97)	(2.83)
N	1132	1132	1132	1132	1132	1132	1132	1132
Pseudo R^2 (upper)	0.1523	0.1258	0.2282	0.1750	0.2872	0.2162	0.3356	0.2178

Pseudo R^2 (lower)	0.0717	0.0834	0.1523	0.1258	0.2282	0.1750	0.2872	0.2162

Notes: Boot Strapped Standard Errors with 100 replications. *t*-values in parenthesis.

Table 7 Quantile Regression Estimates for 1993 and 1998 (Black Households)

	q10		q25		q50		q75		q90	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
AGEHD	−0.0242	0.5223	−0.7225	0.5644	−0.2590	0.6266	−2.4415	0.8545	−10.0912	1.0799
	(−0.01)	(0.88)	(−0.61)	(1.23)	(−0.11)	(0.80)	(−0.53)	(0.53)	(−1.04)	(0.38)
AGEHD2	0.0068	0.0150	0.0101	0.0218	0.0075	0.0281	0.0223	0.0448	0.1275	0.0593
	(0.46)	(2.57)	(0.94)	(4.04)	(0.35)	(3.28)	(0.52)	(2.94)	(1.33)	(2.15)
FHH	−29.1787	−24.0088	−36.6106	−41.2625	−43.4941	−57.3320	−63.7864	−84.1911	−107.2111	−101.9343
	(−4.03)	(−3.36)	(−5.92)	(−4.64)	(−5.11)	(−3.79)	(−3.50)	(−3.26)	(−3.49)	(−2.63)
EDUCHD1	6.3326	14.0287	12.3640	20.9230	27.5365	30.5337	57.5346	76.3515	124.5905	128.1950
	(0.86)	(1.49)	(1.68)	(2.16)	(3.13)	(2.20)	(4.17)	(3.01)	(2.84)	(2.65)
EDUCHD2	44.1057	41.4729	55.6782	68.0166	83.4610	121.0040	111.5547	262.9234	133.3354	409.3992
	(3.10)	(2.48)	(5.46)	(4.92)	(6.55)	(4.70)	(3.73)	(5.52)	(2.17)	(4.84)
EDUCHD3	254.0649	195.7135	271.7320	342.0567	426.5091	549.2464	595.5991	1023.4870	535.6433	2347.1920
	(3.85)	(1.52)	(3.21)	(3.46)	(4.47)	(4.34)	(4.89)	(2.36)	(3.37)	(0.36)
TOTCHILD	−5.1770	−5.6420	−9.5973	−9.5501	−16.1207	−13.7183	−23.4597	−12.6666	−31.7728	−19.5175
	(−2.60)	(−3.57)	(−6.67)	(−5.02)	(−7.17)	(−5.39)	(−6.35)	(−3.23)	(−5.09)	(−2.51)
TOTADULT	−1.9002	−1.2069	−4.2778	−4.1538	−5.6757	−4.6483	−7.2695	−13.9145	−18.0806	−14.7413
	(−0.76)	(−0.46)	(−2.27)	(−1.94)	(−2.09)	(−1.43)	(−1.62)	(−2.67)	(−1.90)	(−1.21)
TOTELDER	21.1116	2.6087	30.8058	1.9266	31.7207	−8.5496	51.4485	−24.6443	13.1545	−93.5682
	(2.25)	(0.36)	(4.74)	(0.28)	(3.85)	(−0.84)	(4.16)	(−1.28)	(0.31)	(−2.80)
RURAL	−21.8929	−64.0471	−47.9432	−96.1446	−59.1476	−120.6384	−123.8913	−210.5827	−392.4397	−356.1514
	(−1.71)	(−5.22)	(−4.56)	(−6.25)	(−3.97)	(−5.36)	(−2.67)	(−4.15)	(−4.26)	(−3.97)
CONSTANT	70.4561	83.5842	181.2186	170.8866	249.3917	260.6142	483.5774	410.8667	1071.7970	730.7830
	(1.29)	(2.93)	(5.19)	(7.51)	(3.77)	(8.02)	(3.65)	(5.88)	(4.92)	(4.66)

N	964	964	964	964	964	964	964	964	964	964
Pseudo R^2	0.0742	0.0678	0.1207	0.0880	0.1527	0.1136	0.1966	0.1296	0.2859	0.1303

Notes: Boot Strapped Standard Errors with 100 replications. *t*-values in parenthesis.

Table 8 Quantile Regression Es timates for 1993 and 1998 (All Households)
Dependent Variable = Log (Per Adult Equivalent Income)

	q10		q25		q50		q75		q90	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
AGEHD	0.0191	0.0065	−0.0048	0.0067	−0.0068	0.0061	−0.0107	0.0057	−0.0013	0.0085
	(0.61)	(0.79)	(−0.47)	(1.46)	(−0.52)	(1.53)	(−0.97)	(1.45)	(−0.06)	(1.89)
AGEHD2	0.0000	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(−0.01)	(2.60)	(1.08)	(3.14)	(0.82)	(3.61)	(1.06)	(2.64)	(0.41)	(1.99)
FHH	−0.4696	−0.2575	−0.2658	−0.2591	−0.2275	−0.2706	−0.2089	−0.2249	−0.1960	−0.1998
	(−3.35)	(−2.09)	(−3.41)	(−3.25)	(−3.70)	(−4.51)	(−3.02)	(−3.14)	(−1.89)	(−2.15)
EDUCHD1	0.1742	0.2136	0.1612	0.1964	0.2074	0.1845	0.3057	0.3024	0.3173	0.3158
	(1.20)	(1.32)	(1.94)	(2.62)	(3.18)	(2.27)	(5.07)	(3.64)	(3.10)	(2.65)
EDUCHD2	0.6360	0.6162	0.5354	0.6015	0.5008	0.6782	0.5685	0.8009	0.4390	0.7776
	(2.94)	(2.95)	(5.76)	(6.10)	(5.52)	(6.98)	(7.48)	(9.22)	(3.43)	(5.44)
EDUCHD3	1.9172	1.3628	1.6296	1.4245	1.4668	1.3245	1.4153	1.2538	1.0467	1.2324
	(6.05)	(2.72)	(12.62)	(8.70)	(10.73)	(9.76)	(10.04)	(8.24)	(4.71)	(3.31)
TOTCHILD	−0.1247	−0.0659	−0.1116	−0.0791	−0.1379	−0.0932	−0.1291	−0.0712	−0.1166	−0.0873
	(−4.14)	(−2.74)	(−7.48)	(−6.84)	(−10.43)	(−9.54)	(−9.40)	(−6.72)	(−6.29)	(−5.75)
TOTADULT	−0.0287	−0.0347	−0.0424	−0.0429	−0.0297	−0.0423	−0.0275	−0.0468	−0.0628	−0.0076
	(−0.69)	(−0.98)	(−1.83)	(−3.13)	(−1.66)	(−3.91)	(−1.50)	(−3.21)	(−2.45)	(−0.34)
TOTELDER	0.2371	0.0774	0.2458	0.0268	0.2212	−0.0413	0.1923	−0.0369	0.0509	−0.1710
	(1.80)	(0.82)	(4.55)	(0.57)	(4.44)	(−0.97)	(3.75)	(−0.67)	(0.55)	(−2.77)
BLACK	−0.6574	−0.5143	−0.6255	−0.6418	−0.6176	−0.5331	−0.5799	−0.6929	−0.6435	−0.5406
	(−1.85)	(−2.01)	(−4.52)	(−3.85)	(−5.66)	(−5.34)	(−5.42)	(−4.56)	(−4.22)	(−3.73)
RURAL	−0.3910	−0.6471	−0.3465	−0.5954	−0.3839	−0.4756	−0.3751	−0.4708	−0.5643	−0.4880
	(−2.24)	(−5.70)	(−4.31)	(−8.68)	(−5.40)	(−8.78)	(−4.25)	(−5.81)	(−5.90)	(−4.20)
CONSTANT	4.2686	4.6143	5.7638	5.5816	6.3858	5.9270	6.8654	6.4460	7.2981	6.7451
	(3.66)	(9.37)	(16.42)	(23.70)	(16.98)	(32.12)	(21.49)	(32.09)	(15.45)	(29.06)
N	1132	1132	1132	1132	1132	1132	1132	1132	1132	1132

Pseudo R^2	0.1391	0.2015	0.2129	0.2370	0.2700	0.2855	0.3138	0.2956	0.3345	0.2793

Notes: Boot Strapped Standard Errors with 100 replications. *t*-values in parenthesis.