

NBER WORKING PAPER SERIES

PUBLIC POLICY AND EXTENDED FAMILIES:
EVIDENCE FROM SOUTH AFRICA

Marianne Bertrand
Douglas Miller
Sendhil Mullainathan

Working Paper 7594
<http://www.nber.org/papers/w7594>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 2000

We are extremely grateful to Abhijit Banerjee, Anne Case, Angus Deaton, Esther Duflo, Jon Gruber, Michael Kremer, Jonathan Morduch, Jim Poterba and to seminar participants at the MIT Public Finance Lunch, Princeton Development Workshop, and Harvard/MIT Development Seminar. Doug Miller acknowledges financial support from the National Science Foundation's Graduate Fellowship Program. The views expressed herein are those of the authors and are not necessarily those of the National Bureau of Economic Research.

© 2000 by Marianne Bertrand, Douglas Miller, and Sendhil Mullainathan. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Public Policy and Extended Families: Evidence from South Africa
Marianne Bertrand, Douglas Miller, and Sendhil Mullainathan
NBER Working Paper No. 7594
March 2000
JEL No. D1, E2, H0, I3, J2, O1

ABSTRACT

Tightly knit extended families, in which people often give money to and get money from relatives, characterize many developing countries. These intra-family flows mean that public policies may affect a very different group of people than the one they target. To assess the empirical importance of these effects, we study a cash pension program in South Africa that targets the elderly. Focusing on three-generation households, we use the variation in pension receipt that comes from differences in the age of the elder(s) in the households. We find a sharp drop in the labor force participation of *prime-age* men in these households when elder women reach 60 years old or elder men reach 65, the respective ages for pension eligibility. We also find that the drop in labor supply diminishes with family size, as the pension money is split over more people, and with educational attainment, as the pension money becomes less significant relative to outside earnings. Other findings suggest that power within the family might play an important role: (1) labor supply drops less when pension is received by a man rather than by a woman; (2) middle aged men (those more likely to have control in the family) reduce labor supply more than younger men; and (3) female labor supply is unaffected. These last two findings also respectively suggest that the results are unlikely to be driven by increased human capital investment or by a need to stay home to care for the elderly. As a whole, this public policy seems to have had large effects on a group—prime age men living with the old—quite different from the one it originally targeted—elderly men and women.

Marianne Bertrand
Department of Economics
Princeton University
Industrial Relations Section
Firestone Library
Princeton, NJ 08544-2098
and NBER
mbertran@princeton.edu

Douglas Miller
Princeton University
Princeton, NJ 08544-2098
Dlmiller@princeton.edu

Sendhil Mullainathan
Department of Economics
MIT
50 Memorial Drive, E52-380A
Cambridge, MA 02173
and NBER
mullain@mit.edu

1 Introduction

Sharing of resources between family members can alter the impact of social policies, an effect that is especially relevant for developing countries. Indeed, traditional living arrangements in these countries often involve the cohabitation of a large array of family members. Targeted public transfers to specific demographic groups within these extended households could then have important behavioral effects on some non-targeted groups if redistribution is large. Who in the end will benefit from the government's targeted transfers depends on the identity and relative bargaining power both of the program's originally targeted group and of the other family members.

We investigate such effects in the context of a South African pension program that targets the elderly. Under the state pension program, women over the age of 60 and men over the age of 65 receive what in practice is a lump sum cash transfer.¹ Since the pension targets a group who are by and large already out of the labor force, and conditions mainly on an unalterable variable, age, we might expect it to have little effect on labor supply in the economy.² The pension is, however, quite large (amounting to more than twice the median per capita monthly African household income). Because many of the African pensioners live with younger relatives rather than on their own (as they would instead in most developed countries), we may reasonably expect some of this money to flow to these relatives. These younger relatives, in turn, may lower their labor supply as a result of the incoming money.³

¹In theory, the transfer program is means-tested but this seems to have little effect in practice for Africans, whose income is quite low relative to the test. See Section 3.

²A labor supply effect might arise because the pension increases expected future income of the young. But this would effect all the young equally, not merely the relatives of pensioners as our results suggest.

³A large literature has tried to assess how household resources are allocated between their members (a recent survey of this literature can be found in Strauss and Thomas, 1995). However, because household surveys typically provide information on aggregated household consumption only, and not on individual consumption, it has been difficult to directly study how resources are redistributed between household members. For that reason, the bulk of the literature in this field does not directly study the allocation of consumption but rather compares health and education outcomes among specific members. The best-known work compares health outcomes between girls and boys within a household and finds excess infant mortality among girls (see among others Dreze and Sen, 1989). In

In theory, relatives may change their labor supply for two reasons. First, the increased income coming from the pension transfer may produce an income effect: increased income allows consumption of greater leisure (or reduced search effort). Second, the elderly may transfer the money to their relatives in a non lump-sum fashion, giving more to the needy ones. This family safety net may then produce a disincentive effect to work for the same reason government safety nets do: the marginal dollar of income is taxed (here, by a reduction of transfers from the elderly).⁴ Both mechanisms, however, generate the same effect: a fall in labor supply that would have been unexpected if the effect of families were ignored.

Anecdotal evidence and newspaper articles point at the redistributive effect of the social pensions in South Africa. For example, one article mentions that “the impact of pensions on communities with a high rate of unemployment was huge, as multi-generation households formed a constellation around the person receiving the pension” (Ngoro, 1998). Another describes a pensioner’s “five children, who also live with him in his two-bedroom flat, contribute to the family income when they can find work. But none has a full-time job” (Caelers, 1998). The findings in this paper suggest that the behaviors depicted in these anecdotes are quite prevalent and likely led to a drop in labor supply amongst prime age men.

To identify the effects of the program, we focus on African males between 16 and 50 years old that live in three-generation households. We then compare households where the elders are eligible for the pension (women over 60 or men over 65) to households where the elders are not. Our source of variation, therefore, will be the threshold effects of the pension rules, which generate a sharp rise

this paper, we use allocation of leisure (labor supply) as an indirect way to capture individual consumption.

⁴In contrast to our safety net analogy, Becker (1981) has argued that under some conditions “Each beneficiary, no matter how selfish, maximizes the family income of his benefactor and thereby internalizes all effects of his actions on other beneficiaries.” Our application, because of the existence of leisure or search effort, resembles much more closely the analysis by Bergstrom (1989). In these cases, the Rotten Kid Theorem may no longer hold. Altruistic feelings by the recipient towards the elderly can, however, reduce the distortion on behavior, a point we will address shortly.

in income when the elder hits the threshold age. We find that prime-age men are significantly less likely to work when they live with a pensioner. Furthermore, one sees a clear discontinuity exactly at the age-eligibility frontier, with labor supply dropping at the age of 60 for presence of female elders and 65 for presence of male elders in the household. In fact, the age of the elderly does not seem to affect labor supply except at these discontinuous points. Further results suggest that these effects are neither driven by the selection of low ability males into pension households, nor by an independent effect of elders' age (such as the need for home care).

We then examine the pension receiving households more closely. By studying the determinants of the size of the labor supply response, we hope to learn about intrahousehold distribution patterns. Our findings suggest that demographic variables such as sex and age are important determinants of the distribution patterns. First, we find that a rand of pension money that goes to a female pensioner reduces prime-age male labor supply more than a rand of of pension money that goes to a male pensioner.⁵ This is consistent with a model in which either old women are "weaker" and have their pensions expropriated more easily or old women are merely more soft-hearted and exhibit greater altruism towards their children.

A second and related point is that we find no impact of the pension money on prime-age female labor supply. This finding also challenges the interpretation that the prime age individuals remain at home in order to take care of the elderly. If this were the case, one would expect bigger effects amongst women.

⁵A few papers have tried to assess whether demographic characteristics of the income recipient matter in resource allocation. More specifically, some researchers have studied whether money in the hands of women leads to a different resource allocation than money in the hands of men. For example, Schultz (1990) suggests that money in the hands of women rather than men leads to stronger decline in fertility. Thomas (1990) shows that female sources of unearned income are associated with improvement in child health. Unlike our work, male and female labor incomes in most of those previous studies result from different economic activities. They might thus vary with respect to their riskiness or liquidity, which makes the isolation of a gender effect very difficult. Moreover, the studies relying on unearned sources of income suffer from the very possible endogeneity of that variable.

Third, the labor supply of the older males is reduced *more* than that of younger males. A 40 year old male shows greater effects than a 20 year old. Again, this is consistent with elder males being able to exert more power in order to extract more of the pension for themselves. This also implies that the reduction in labor supply is unlikely to be due to an increase in training.

The rest of the paper is organized as follows. Section 2 briefly outlines a model of the labor supply decision in the presence of intra-family redistribution, stressing the possibility for both income and disincentive effects in explaining the labor supply reaction to the family transfer. Section 3 describes in more detail the historical origin and institutional features of the South African social pension program. Section 4.1 describes the data while Section 4.2 lays out the empirical methodology. The results are presented in Section 5. Eventually, we offer concluding remarks in Section 6.

2 Intra-Household Redistribution and Labor Supply

In this section, we sketch a simple model that illustrates how the targeted pension can affect prime age labor supply. Suppose that an amount T of the total pension money allocated to the pensioners in a household is redistributed towards each working-age individual in that household. We begin by taking T as given. Later in the section, we discuss some of the potential determinants of T . Suppose that the utility of a working age individual depends on their consumption and leisure: $U = f(l) + g(c)$, where l represents non-work time, c represents consumption and f and g are increasing and concave functions. Leisure, l , represents the amount of time not spent working but also, in the context of high African unemployment in South Africa, the amount of time not spent looking for work. Assume that one unit of time has to be allocated between leisure and

non-leisure time. At this point we assume that the working-age person has no altruism towards the pensioner. Taking the price of one unit of consumption to equal 1, the working-age individual's budget constraint is given by: $c = T + w * (1 - l)$, where w is the expected hourly wage.

2.1 Pure Income Effect

Suppose that the transfer T from the pensioner to the working-age individual occurs as a lump-sum transfer. In that case, the optimal level of leisure time are implicitly given by the following first order condition:

$$\frac{f'(l)}{w} = g'(T + w(1 - l))$$

Obviously in that case, the transfer T operates as a pure income effect. The transfer of pension money shifts the working individual's budget constraint out. Under the standard assumption that leisure is a normal good, one finds that the intra-family transfer reduces the amount of time spent working or looking for work: $\frac{\partial l}{\partial T} > 0$.

2.2 Insurance and Incentive Effects

Suppose now that the transfer T from the pensioner is not lump-sum but rather decreases with the level of working income of the working-age individual: $T = T(w(1 - l))$ with $T'(\cdot) < 0$. This corresponds to the case where pensioners wish to insure the other household members against negative shocks.⁶ This also corresponds to the case where individuals that work less can bargain more successfully with the pensioners, because they have more free time to do so.

⁶Behrman et al. (1995) finds support for such insurance-based intra-household transfers in US data. Using the Panel Study of Income Dynamics, they find that parental transfers seem to favor lower earners.

In that case, the first order condition that implicitly describes optimal leisure time becomes:

$$\frac{f'(l)}{w(1 + T'(w(1 - l)))} = g'(T(w(1 - l)) + w(1 - l))$$

The pension transfer now reduces hours of work through two different channels. First, as in the previous case, pension money reduces work through an income effect. Second, pension money operates as a tax on labor wage. For every extra hour of work, individuals get paid the wage w but lose some of the insurance payment against low income. Hence, in this case, working-age individuals' labor supply drops due to the combination of an income effect and an incentive effect.

It is important to note that *both these effects may be at play* when we analyze the impact of the social pension in South Africa, and that both have a negative impact on labor supply. Our estimated labor supply elasticities derived in this context, therefore, will likely be larger than previous estimates which would reflect either a pure income effect or even the combination of a positive income effect and negative substitution effect.

2.3 Separating Income and Incentive Effects

Empirical work attempting to separate out the income and incentive effects faces difficulties. The presence of altruism towards the elderly provides one channel for separating these two effects in the data. A simple variation of our model illustrates this. Assume that working-age individuals' utility is given by: $U = f(l) + g(c) + \alpha c_e$, where c_e is the level of consumption of the pensioners in the household and α is a parameter that increases with the level of altruism towards the elderly.

Under the assumption of lump-sum transfers from the elderly to the prime-age individuals, one easily sees that the first order condition for optimal leisure time is unchanged as c_e is independent of l . The labor supply of the prime-age individuals is thus unaffected by how much they care about

the pensioners.

On the other hand, if transfers partly occur for insurance purposes, altruism levels will affect the labor supply response. The first-order condition now becomes:

$$\begin{aligned}\frac{f'(l)}{w(1 + T'(w(1 - l)))} &= g'(T(w(1 - l)) + w(1 - l)) + \alpha \frac{T'(w(1 - l))}{1 + T'(w(1 - l))} \\ &= g'(c) + \text{altruism}\end{aligned}$$

As working-age individuals care more about the pensioners, they reduce their labor supply less as they internalize more strongly the subsequent reduction in the pensioners' consumption level. Thus, one could look for evidence of an insurance effect by comparing the sensitivity of labor supply to pension income for people with high altruism towards the pensioners versus people with low altruism. Finding that altruism decreases the labor supply response to the pension would provide evidence for the presence of incentive effects. In practice, one cannot directly measure altruism in the survey data. One can however imagine subjectively assigning some altruism ranking to the various prime-age individuals within a household. For example, it might seem reasonable to assume that the sons of pensioners would care more about the pensioners than in-laws or more distant relatives would.

Finally, it is important to note that this exercise was performed under the assumption that the pensioners themselves do not differentiate between different household members in their transfer payments. We come back to this point in the next section.

2.4 Possible Determinants of T

To this point, we have not discussed how T , the level of transfers from the pensioners to the working-age individuals in the household, is determined. As noted above, two forces seem important in

determining the level of transfers between two given individuals in a household: bargaining power and altruism.

More realistic models of families indeed assume that families are equivalent to a collection of individuals bargaining over resources.⁷ In the context of such models, an important determinant of the labor supply response of a given individual to the pension will be the level of bargaining power and altruism which that individual has when bargaining over the new financial resource with the pensioners. Additionally, one will need to consider dimensions along which the bargaining power and altruism of the pensioners themselves will vary.

If females have less voice within their household and are allocated less resources in general, one might expect that the labor supply of prime-age females would be less responsive to the presence of pension money.⁸ Similarly, female pensioners may give up more of their pension money than male pensioners have to. Age could also affect bargaining power if one believes that a middle-aged man may find it easier to exert control over pensioners than a teenager or young adult would.

Finally, experimental evidence suggests that women may display more altruism than men. For example, Eckel and Grossman (1998) and Andreoni and Vesterlund (1998) have investigated gender effects in different versions of the dictator game. They have found that women typically are more generous than men are. In that case, one might expect that female pensioners will redistribute more of their pension income than male pensioners will.⁹ Also, pensioners may weigh the consumption

⁷See among others Mc Elroy and Horney (1981), Mc Elroy (1990) and Lundberg and Pollack (1993). Chiappori (1992) presents a much more general model of collective decision making that makes only the assumption that "family" decisions are Pareto-Efficient. This would include the simple cases of Nash Bargaining, for example.

⁸As we mentioned earlier, a large literature has studied the importance of children's gender in the allocation of resources within a household. While there is no strong evidence that boys displace more adult expenditures than girls, outcome measures such as excess infant mortality clearly reveal a strong bias against girls. See Deaton (1998, pp 238-241) for a discussion of this puzzle.

⁹Distinguishing between variation in bargaining power and variation in altruism is a difficult task and we do not claim to achieve this task in this paper. For example, we will find evidence that labor supply is indeed more responsive to the presence of female pensioners than to the presence of male pensioners. This fact is consistent with the idea that females have less power when bargaining over resources but is also consistent with the idea that females have a stronger preferences for redistribution. The main policy implications of the paper are we believe unaffected by which

of their offspring more than the consumption of the unrelated in-laws that cohabit with them. We will investigate these effects in Section 5.

3 Description of Pension Program

We now describe the details of the South African pension program. Additional information about the historical background, institutional features, and practical implementation of this program can be found in Lund (1993), Van den Berg (1994) and Case and Deaton (1998).

Although the existence of a social pension program in South Africa dates back to the 1920s, it has historically been intended for White South Africans only. The process of disintegration of the apartheid regime in the late 1980s and early 1990s led to pressures for more racial parity in pension eligibility and benefits. As a consequence, pension levels for African households nearly doubled between 1990 and 1993 and the size of the state pension was roughly equalized between racial groups by 1993, the date at which the data set used in this paper was collected.

Eligibility for pension receipt is determined primarily by one's age. Only women over the age of 60 and men over the age of 65 are eligible for the state social pension.¹⁰ Also, the state social pension is means-tested. The means-testing is such that most Whites get excluded from the pension while most Africans are entitled to the maximum benefits. Case and Deaton (1998) show that 14% of White women and 7% of White men report receiving the pension; take up rates among African women and men are 80 and 77 % respectively.¹¹

The South African social pension is a very generous program. The maximum benefit in 1993,

of these two interpretations fits reality best.

¹⁰In practice, some local authorities have been equalizing the pension eligibility age between men and women. Hence, a non trivial share of men between 60 and 65 years of age report receiving a pension.

¹¹Case and Deaton (1998) also note that the means-testing formula does not take into account income from other family members than the elderly. Hence, there are no direct incentives in the program design for family dissolution or migration.

the year the survey used in this paper was conducted, was 370 rand per month. This is an extremely large amount relative to Africans' average income levels. 370 rand is about half the average household income and more than twice the median per capita income among Africans. Because the transfers are so large, it is reasonable to expect that intrahousehold redistribution could lead to significant behavioral responses, such as a reduced willingness to participate in the labor force, among the members that are not originally targeted by policy makers. We proceed to empirically analyze this question in the next sections.

4 Data and Empirical Methodology

4.1 Data

The data we use is the Integrated Household Survey of South Africa. This survey is the result of a cooperation between the World Bank and the South African Development Research Unit (SALDRU) at the University of Cape Town.¹² The survey consists of a random sample of 9000 households and was conducted during the second half of 1993. By this time racial parity had been achieved in the levels of the social pension. The survey classifies people into four different racial groups: White, Coloured, Indian and African. In the rest of the paper, we focus only on African households. As we mentioned earlier, the means-testing of the pension is such that only a small share of older white women and elder white men report receiving any pension transfers (14 and 7 % respectively). While a larger share of Coloureds and Indians do report receiving the pension, their participation rate is still well below the African levels (Case and Deaton, 1998). Also, as we mentioned earlier, we prefer to focus on African households also because of the much larger

¹²The database used in the paper can be directly downloaded from the World Bank webpage: <http://www.worldbank.org/html/prdph/lsms/country/za94/za94home.html>.

prevalence of multi-generation households in that racial group.

The survey very much follows the World Bank's Living Standard Surveys framework and collects information a wide variety of household and individual characteristics. To carry through our study, we exploit survey data on labor force participation status, migration, health status, intrahousehold relationships and pension income receipt, as well as on a set of typical individual and household demographic characteristics.

The dependent variable used in most of our regression is the employment and labor force status of working-age individuals.¹³ Each person over the age of 16 in the household was asked whether they were currently employed or not. If not, they were asked if they had looked for work during the previous week. We use answers to these two questions in order to classify people as employed, unemployed, and not in the labor force. Individuals out of the labor force were then asked why they did not look for work in the previous week. We defined discouraged workers as the subset of individuals out of the labor force that did not look for work because they thought there was "no jobs or work available."

4.2 Empirical Methodology

The basic source of identification in this paper consists in comparing labor force and employment status among working-age individuals that live with age-eligible elderly relative to those that do not. More specifically, we propose to instrument the amount of pension benefits received by a household with the number of age-eligible men and age-eligible women in that household. By not directly using the amount of pension benefits as a source of variation but only pension eligibility, we avoid picking up on differences in both take-up rates and pension amounts received that could

¹³In practice, we will focus on males for most of the analysis.

be correlated with both observable and unobservable household characteristics that might affect labor force participation and employment.¹⁴

This identification strategy is subject to a set of potential biases. We now enumerate these biases and briefly preview how we have dealt with them in the empirical work. Our primary concern is that individuals living in pension-eligible households are systematically different from individuals living in households which do not contain eligible members. In general, the characteristics of the members of a pension eligible and of a non-eligible household are not entirely similar. As we report later, non-elderly men living in pension households are slightly younger than their counterparts in non-eligible households. Furthermore, pension eligible households are more likely to be rural households, and are on average larger. It is conceivable that prime age men living with older individuals are less qualified for work, less willing to look for work, or in some other way less likely to find work. If this were the case, then our estimated effects of pension receipt would be biased toward finding an impact.

We take a couple of approaches in order to minimize the importance of this potential source of bias. First, we restrict our focus to individuals living in three- or more generation households. Without this restriction, we would be comparing between the young who live with the elderly and the young who don't. Since there would be clear selection in the young who manage to move away from the elderly, our estimates would be biased. Second, *within the set of three-generation households*, we show a clear discontinuity in how the presence of elderly affects labor supply at the

¹⁴The ideal data source for this project would contain more time variation. More specifically, panel information covering households before and after they became eligible would make it easier to measure the effects of pension receipt. Alternatively, another cross-sectional household survey similar to the one used here but carried out *prior* to the racial equalization of the state pension program among races would allow us to assess differences in labor force outcomes which arise purely through demographic effects and are not related to the state social pension. The 1991 South African Census is in theory a potential source of pre-pension data. Unfortunately, the coding of the family links in the Census is such that one cannot define three-generation households in the Census with as much precision as in the World Bank/SALDRU data, thereby making comparisons between these two surveys very difficult.

ages of pension eligibility, 60 and 65 years old for women and men respectively. More specifically, we show that working-age men's labor supply does not seem affected by the presence of elderly in general but only by elderly that are age-eligible. Finally, *within the set of three-generation households*, we look for any systematic difference on observable characteristics among working-age individuals living in eligible households and non-eligible households. More specifically, we compare educational attainment and find no significant differences between the two type of households.

We have isolated two additional possible sources of biases; we directly deal with both of them in the next section. To start, one might worry that otherwise identical individuals may behave differently when living with the elderly. This could occur mainly if older people need more care, forcing people living with them to stay at home and provide that care. We deal with this issue by comparing labor supply responses for men and women (under the assumption that women are the main input in the production of home care), and by directly controlling for the health of the elderly. Finally, we are clearly concerned by issues of selective migration that result from the pension: worse children may choose to move back home. We explore these issues using migration information provided in the survey. We conclude that neither of these two potential biases seem to be contaminating our results.

5 Results

5.1 Summary Statistics

Table 1 presents means and standard deviations of the main variables of interest for African males between the ages of 16 and 50, who live in three generation households.¹⁵ A three-generation

¹⁵Because most of the regressions below will concentrate on prime-age males only, we have preferred to present and discuss summary statistics for that group only. The same regularities emerge when we study means and standard deviations for both African men and African women between 16 and 50 years of age.

household is a household where (at least) a son or a daughter lives with her/his mother or father and with her/his grand-mother or grand-father. As we mentioned earlier, focusing on this type of living arrangements seems a priori appealing as three-generation households are known to be very common among African families (see Ardington and Lund, 1994) and as it should lead to lower heterogeneity between eligible and non-eligible households.

More than a third of the prime-age males in our original sample live in a three generation households (sample size goes from 6718 to 2540). The bulk of the data which is dropped comes from households that are not age-eligible. In other words, a large proportion of women over 60 years of age and of men over 65 years of age live in a three-generation household. This has previously been noted in Case and Deaton (1998).¹⁶ Because our identification of the pension impact will eventually rely on the presence or not of age-eligible persons in the household, we also present these means and standards deviations separately for households that contain at least one elderly person that is age-eligible and households that do not.

We note several facts in Table 1. First, only 26% of the males in this sample are employed. Of the remaining 74%, 10% are unemployed and 23% are discouraged, leaving roughly 31% out of the labor force and not searching actively for work, but also not discouraged. This dramatically low employment rates and high discouragement and unemployment rates among prime-age African males is a characteristic of the South African labor markets that has been well-documented in previous work. Second, the differences between eligible and ineligible households are small. For example, there is little difference in education, household size or the geographical distribution across rural and urban areas.¹⁷ One noticeable difference between the two household types (besides

¹⁶As naturally expected, households that contain eligible elderly but which are not three-generations are on average much smaller (a little less than 4 persons on average) and older.

¹⁷A similar exercise performed on all males, not only those in 3-generation households produces dramatic differences on such variables. This underlines the importance of focusing on only 3-generation households.

employment) in Table 1 is that prime-age males in eligible households report being sick more often. One might argue that sickness is in fact a luxury good among those African households and that this might be looked at as an *outcome* of the social pension. Table 1 shows some other interesting facts. The average eligible household has .9 eligible women and .34 eligible men, for a total of 1.24 eligible members. Most of the pensions, therefore, come through a woman and many households have more than one pensioner. Pension income in these households also accounts for more than a quarter of the total household income. This underlines once more the generosity of the social pension program.

5.2 Basic Results

Focusing on only three-generation households, we estimate our basic employment regressions in Tables 2, 3 and 4. Table 2 considers the effect for both men and women between 16 and 50 years old, while Tables 3 and 4 concentrate on prime-age African men and women respectively. In these tables and all the tables that follow, standard errors will be corrected to allow for within-family correlation in outcomes. Because the three tables have exactly the same structure, we only explain the construction of Table 2 in detail.

Each regression in Table 2 controls for, in addition to the pension variable, a quartic in individual age, a dummy for whether the individual completed 8th grade, 14 province dummies, a rural area dummy, an urban area dummy, a metropolitan area dummy, a female dummy, household size, number of household members between 0 and 5, 6 and 15, 16 and 18, 19 and 21 and 22 and 24.¹⁸

Columns (1) and (2) estimate the basic OLS regressions of employment status on pension income

¹⁸The completion of matric (10th grade) is another important determinant of employment and unemployment probabilities among South African men and women. Our results are unaffected if we use the completion of 10th grade instead of the completion of 8th grade as a control for educational attainment.

and a dummy for pension receipt. Both as a continuous variable and as a dummy variable, the social pension correlates negatively with employment probabilities for prime-age individuals. In column (3), we first try to account for the endogeneity in take-up rates and directly use the age-eligibility criterion as the source of variation. We find a similar negative employment effect in the households that have at least one age-eligible person compared to the households that do not.

Column (4) contains our preferred specification where we instrument the continuous pension income variable with the number of females over 60 years old and the number of males over 65 years old in the household. The first-stage regression associated with column (4) (not reported here) shows that both the number of age-eligible women and the number of age-eligible men are the significant determinants of monthly pension income. The coefficient on number of women over 60 years of age is 259.85 while the coefficient on number of men over 65 years of age is 230.15. One cannot reject the null hypothesis that these two coefficients are the same at standard confidence levels and hence that the men and women have similar take-up rates. The instrumental variable (IV) coefficient on pension receipt in column (4) of Table 2 is even more negative than the OLS coefficient in column (1).¹⁹ One extra rand reduces employment probability by about .02 percentage points in the IV regression and .01 percentage points in the OLS regression. This difference between OLS and IV coefficients may be due to measurement error in the pension receipt variable that attenuates the OLS estimate towards zero.

Hence, findings in Table 2 suggests that at least some of the pension income that is in theory targeted towards the elderly ends up being redistributed towards or captured by the working-age members of the household. The income and/or incentive effects associated with this intra-family redistribution significantly reduce the number of working-age members that are employed in the

¹⁹A partial test of whether the instruments are correlated with the error term (not reported here) fails to reject the null hypothesis of no correlation at the .10 level.

households that receive a pension income.²⁰

Tables 3 and 4 present the same set of regressions separately for men and women respectively. A comparison of these 2 tables show that while the state pension seems to reduce prime-age male employment in three-generation households, it does not seem to affect female employment in these households. While the point estimates on the various pension measures are always negative, the effects are much smaller than for men and not at all statistically significant. In the context of the theoretical model we discussed earlier, one could interpret the lack of a labor supply response among prime-age women as evidence that these women have a much lower bargaining power and/or display more altruism towards other household members. We come back to this discussion in further detail in section 5.5.²¹ The rest of the paper mainly focuses on working-age males in three-generation households.

Table 5 present regressions equivalent to columns (1) and (4) in Table 3 for 3 new dependent variables: unemployment (columns (1) and (2)), labor force participation (columns (3) and (4)) and discouragement (columns (5) and (6)). As in Table 3, all the regressions contain as regressors a quartic in individual age, a dummy for whether the individual completed 8th grade, 14 province dummies, a rural area dummy, an urban area dummy, a metropolitan area dummy, household size, number of household members between 0 and 5, 6 and 15, 16 and 18, 19 and 21 and 22 and 24.

Table 3 showed that there was a significant decrease in employment probability among the prime-age males living with pensioners. These “missing” working men could have either entered a phase of unemployment or have instead dropped out of the labor force. Also, while they could be

²⁰These results very likely imply that household *non-pension* income declines when pension income increases. Jensen (1998) explores another channel, the decline in remittance income, through which the social pension can affect non-pension income.

²¹As we will see in section 5.5, similar gender differences can be observed when we consider the sex of the pensioners. Pension money in the hand of female elderly reduces labor supply more than pension money in the hand of male elderly. These two gender effects are consistent with lower female bargaining power and/or higher female altruism.

“happily” out of the labor force, they may also have stopped looking for work because they think no work is available for them, which we earlier defined as discouragement.

If the discouragement variable truly captures people’s pessimistic beliefs about their chance of finding a job, there is no very direct reason to think that the social pension should affect the discouragement rate. In fact, if the pension has any impact on labor market conditions, one would expect such an impact to be positive and lead to the creation of new working opportunities. Instead, we expect the social pension to affect employment either by reducing labor force participation or by increasing unemployment. Indeed, the missing working men may simply have opted to stay at home or to go back to school.²² Alternatively, these missing working men may have decided to quit previous jobs that were not fully satisfactory and to use the pension money as a buffer income as they are looking for a new job.

Columns (1) and (2) of Table 5 shows that this second story is unlikely to characterize what is happening within these families. Indeed, unemployment probabilities appear unaffected by the pension. Rather, and as it mechanically expected, the missing working men appear to be now out of the labor force (columns (3) and (4)). In other words, the pension is correlated with the prime-age males reporting an absence of job search altogether, rather than reporting unsuccessful job search. Finally, as would have been predicted if discouragement is a meaningful concept, the probability of discouragement does not seem to increase with pension receipt (columns (5) and (6)). Although the coefficients are of moderate economic size, they are statistically insignificant. In summary, living in a household that receives a pension income is associated with lower employment for the prime-age males that live in that household, almost all of which shows up as an exit from the labor force.

What is a rough order of magnitude for the effects found here? Consider prime-age males only.

²²We will show in Table 14 that the schooling effects cannot be very important as most of the effect on employment probability is due to older men that are beyond schooling age.

Average wage among working people in the sample of three-generation households is about 940 rands²³. Suppose the true pension effect lies between the OLS and IV estimates and is -.00015. Consider the extreme case scenario where prime-age males capture the entire pension income. Because there are about 2 prime-age males per household, this means that for each extra rand of pension income the male sees $\frac{1}{2}$ a rand. The estimated coefficient, therefore, implies that an extra rand of income to him leads to a drop in labor supply of $-.0003$. In elasticity terms, a ten percent rise in income (= 94 rands) leads to a 2.8 percentage point drop in labor supply. Since labor supply is 26 percentage points for this sample, this implies (roughly) an elasticity of -1 . Such estimates are quite large.²⁴ Moreover note that we might be making conservative estimates. If we assumed that the pension were split over more household members, the elasticities would become more negative.²⁵ One reason for the large number is likely the very low employment rate in the first place. Such low employment rates make the marginal return to search quite small, lowering in effect the cost of leisure. It is also important to note that since both income and incentive effects might be operating, these pure income elasticities may not be appropriate. This could also explain the large numbers. We merely compute these numbers to illustrate the magnitude of the effects: the pensions appear to cause large drops in labor supply.

²³Average household income net of pension is about 1190 rands and there are on average 1.25 employed persons per household.

²⁴See Imbens, Rubins and Sacerdote (1999) for evidence on labor supply elasticities from the US.

²⁵How reasonable is the assumption the assumption that working-age males receive the full pension income? The lack of a labor supply response among prime-age females suggest to us that not all household members are likely to receive similar amounts. On the other hand, Dufló's (1999) findings show that the social pension improved the anthropometric status of girls under 5, suggesting that some of the pension income is spent on children. We will also show later that the size of the labor supply response does indeed depend on total household size.

5.3 Possible Confounding Effects

5.3.1 Direct Effect of the Presence of Elderly in a Household

As we mentioned already in section 4.2, several problems arise when interpreting the observed employment effect as a causal effect of the pensions mediated through by family redistribution. Households with pensioners simply have older people around than households without pensioners. In fact, the age of the elderly in the household generates the entire source of variation in pension eligibility. If this affects labor force participation or employment status for prime-age males for some other reason than the access to the social pension, or if the prime-age males that live with the elderly are intrinsically different, then our results could be contaminated and would not reflect the causal effect of the pension. We propose to address this problem very directly by looking for non-linearities in the effect of the age of the elderly.

The pension program rules predict a specific form for these non-linearities: existence of a woman older than sixty or a man older than sixty-five should have large effects. On the other hand, there are no obvious reasons to expect such specific non-linearities at these two age thresholds if what our estimates are capturing is a general impact of the presence of elderly people on the labor supply of younger men.

Table 6 presents the results of this exercise for our sample of prime-age males living in a three-generation household. We examine how employment probabilities for that group are affected by the presence of elderly of different age in different age groups. Column (1) includes as regressors, in addition to the usual list of controls, the number of people in each of the following four age categories: 50-55, 55-60, 60-65, and 65 and over. The coefficients clearly show a negative effect of the presence of elderly between 60 and 65 and an even more negative effect of the presence of elderly

over 65 years old. On the other hand, the presence of older people between 50 and 55 and 55 and 60 seems to have neither an economically nor a statistically significant impact on prime-age male employment. Since the pension kicks in at different ages for men (65) and women (60), column (2) includes different controls for number of women and men above 60. It is striking in column (2) that only the presence of women between 60 and 65 seems to strongly affect the employment status. Elderly men in that age group do not seem to influence employment for the prime-age males. Column (3) includes a separate control for elderly over 70 years of age and finds that both that group and the group of elderly between 65 and 70 affect the employment rate. Note that the effect of age does not seem to become more negative as we look at the older age group. In fact, the point estimate is smaller when we consider the impact of the elderly that are at least 70 years old. Column (4) presents a richer specification where for each of the original four age categories, we break up number of males and number of females. Again, having an old person around only starts to matter significantly at age 60 for women and age 65 for men. This fact is especially striking. Indeed, given that women have longer life spans, the effect of having an older person around should show up at later ages for women than for men. There are no apparent such asymmetries between male and female elderly for the three other age groups. Column (5) replicates this last regression but also breaks down by sex the group of elderly over 70 years of age. This last column presents the only puzzling fact of this table as the group of elderly men over 70 do not seem to affect employment probabilities. In summary however, the results of this table strongly suggest that the employment and labor force effects we found in the earlier tables are indeed the result of the pension rather than caused by having an older person around.

Table 7 presents an alternative way to test whether our estimated employment effects are contaminated by the direct effect of living with elderly. A reason one might think that the presence

of elderly affect employment for the younger household members is that these elderly might be sick and thus require some assistance at home. In Table 7, we reproduce columns (1) and (4) of Table 3 but add an additional regressor that counts the number of people over 50 years of age in the household that report having been sick in the past two weeks. As expected, the presence of sick old people does lower the probability of being at work for the prime-age men. This effect is only marginally significant in column (2). However, the coefficient on pension both in the OLS (column (1)) and IV (column (2)) specifications is unchanged compared to Table 3. Thus, it does not appear that the pension variable is capturing the need to care for sick elderly people. Finally, recall that an additional piece of evidence against this interpretation of our finding is that we fail to find any impact of the pension on female prime-age employment in Table 4. If one believes that women are more likely to withdraw from the labor force to take care of their sick parents or grand-parents, one would have expected the coefficient on the “pension” variable to be stronger for women than for men. We come back to this difference between men and women in section 5.5.

5.3.2 Selection on Unobservables

An alternative interpretation of our findings could be that prime-age males that live in pension-eligible households are simply less employable based on some unobservable characteristics. We believe that one important aspect of this selection problem is already dealt with by our focus on three-generation households. In a sense, our sample is already restricted to the set of prime-age males that have chosen to live with their parents or at least with older people. This erases concerns that unemployable children that stay at home with their parents drive our results. Note that one could be even more accurate in that respect when choosing the sample selection rule. Indeed, while we have restricted ourselves to males between 16 and 50 that live in a three-generation family, this

does not fully insure that all of these males either live with someone of an older generation or of an older age. For example, it is not unlikely that a man of less than 50 years of age would be the grand-father in a three-generation household. Table 8 tries to account for that possibility. Table 8 reestimates columns (1) and (4) of Table 3 for two different subsamples. First, we restrict the sample to the set of prime-age males in a three-generation households where the oldest person is over 50 years of age (columns (1) and (2)). The sample drops from 2540 to 2115. Second, we try to focus on 2nd generation men in the three-generation households. The sample in that case drops from 2540 to 1921. Table 8 shows that the results, especially in the IV specification, are unchanged in these two subsamples. While the point estimates on the pension income are lower in these subsamples than in the sample used in Table 3, they cannot be rejected to be of similar magnitude.

Since our variation comes from the age of the elderly, the selection issue that remains open is if the decision of the "bad children" to stay at home depends on the presence of a social pension income.²⁶ One practical problem with such a selection story is the short time that the program has been in place. It requires that children would have re-sorted on the basis of the program in the short amount of time that it has been in place.²⁷

Nevertheless, we investigate this problem in two ways. First, we examine selection on education. Assuming that individuals' unobserved characteristics influencing employment are correlated with their education level, finding no selection on education level would limit our concern that selection on these unobservable characteristics is biasing our findings. In Table 9, we regress education on the

²⁶If it merely depended on the *age* (independent of pension receipt) of the elder, one would expect greater continuity in the relationship between age of the elder and employment and not the extreme non-linearities we observed in Section 5.3.1.

²⁷While the social pension level for African households only ends up matching the level for White households in 1993, there had been gradual improvement since the late 1980s. One could then imagine that prime-age African males started re-sorting prior to 1993 based on their expectations about future pension levels.

same list of regressors as before (expect of course for educational attainment) and on the continuous pension income variable, both for the OLS and IV specification. The three dependent education variables we consider are a dummy for at least completing 4th grade, at least completing 8th grade, and at least passing the *Matric*. The results suggest that higher pension income is insignificantly (though negatively for the two higher educational attainment variables) related to education. The magnitude of the coefficients is also quite small.²⁸

We also more directly asked whether there was any evidence that more of these prime-age males had migrated recently if they were living in a household that receives or is age-eligible for a pension income. We used as a dependent variable a dummy variable that equals 1 if the prime-age male reported having “move(d) here during the past 5 years.” The results are in Table 10. We find no evidence, either in the OLS or in the IV framework, of stronger migration towards the households with a social pension. In summary, the results in Table 9 as well as our findings on migration behavior support the view that the concern that “bad types” may have selected into the households that receive a social pension is at most of minor importance.

5.4 Other Determinants of Effect

In this section, we briefly investigate two other determinants of the effect of the pension. These two new tables will provide some additional (though more indirect) support for the validity of the preferred interpretation of our findings, that they are reflecting intra-family redistribution of the pension income.

First, as household size gets larger, the distribution of a given pension income will have to be

²⁸It is interesting to note that when we look at the 25 to 50 years old instead (in order to focus on a group that is more clearly finished with school), we find some marginally significant ($p=.069$) evidence of negative selection on education in the particular case where education is measured as completing 8th grade or more and where pension is instrumented with the numbers of age-eligible elderly.

spread over more individuals within the household. In consequence, we expect that the impact of a dollar of pension income on employment probabilities will become smaller as family size increases. Table 11 confirms this prediction. In that table, we run our standard regressions like in columns (1) and (4) of Table 3 but add an interaction of the pension income with household size. Note that in the IV specification, we are now instrumenting two variables: pension income and the interaction of pension income with household size. The instruments are the number of women over 60, the number of men over 65 and the interactions of these two numbers with household size. We do indeed find that the negative employment effect decreases with the size of the household (column (1) for OLS and (3) for IV). Interestingly, total household size more than just the number of prime-age males in the household seem to matter for the redistribution. Indeed, columns (2) and (4) show in the OLS and IV case respectively that the interaction of pension income with number of males between 16 and 50 in the household does not have a significant effect on the probability of being currently at work.

Table 12 considers another test of the reasonableness of our findings. One theoretical prediction is that the first workers to leave employment when some pension income is available inside of the household should be the workers whose reservation wage is the lowest. While we have no direct measure of reservation wage, a possibly good proxy for it is educational attainment. Hence, Table 12 asks how the effect of the pension varies between highly educated prime-age males and uneducated prime-age males, again controlling for other individual, household and geographic characteristics as before. Consistent with the formal argument we made, we find that the pension income depresses employment probabilities relatively more among the set of males that completed 4th grade at most (column (3) for OLS and column (4) for IV) and relatively less among the set of males that have at least passed the Matric (column (1) for OLS and column (2) for IV). In fact, the average effect

of the pension appears positive (in the OLS regression), not negative among the highly educated men, which is an interesting yet puzzling fact.

5.5 Power and Families

In the previous sections, we have built what we believe is a rather convincing case for a causal relationship between the social pension and prime-age male employment. Hence, while the social pension is a cash transfer that is targeted towards the elderly, there is clearly some intra-family redistribution of at least some of this cash in the direction of the working-age males inside of the household. In this last section, we would like to build some intuition about the distribution of power and altruism within households. In order to do so, we will ask how the pension effect varies with various demographic characteristics of both the working-age men and the pensioners that we speculate might be correlated with power and altruism. While we are not able to formally isolate precise channels and mechanisms, the findings in this section are very suggestive about some general patterns of intrahousehold distribution.

Introspection led us to posit that men should have stronger intrahousehold bargaining power and might be less altruistic than women. There are two sources of evidence in the data that are supportive of that claim. First, recall that we find no negative impact of the social pension on female employment in Table 4.²⁹

Second, we asked whether pension money that goes to female elderly reduces employment more than pension money that goes to male elderly. Table 13 shows that each age-eligible woman in the household depresses male employment (column (1)) and labor force participation (column (2)) much more significantly than each age-eligible man does (-.059 versus -.027 for the employment

²⁹In fact, it is a surprise to us that no effect *at all* can be detected for working-age women.

effect). While this finding is extremely interesting, one might want to subject it to alternative interpretations. A major alternative story relies on the fact that age-eligible women have on average a longer life span than age-eligible men, both because women live longer and because women are eligible at a younger age. In that case, the present discounted value of the social pension going to female elderly might be much higher than the present discounted value of the social pension going to male elderly. Assuming that part of the labor supply decision of the working-age males is made based on these present discounted values rather than on the monthly pension flows, this different residual life spans could explain why female pensioners depress employment probability relatively more even with equal power and/or altruism across sex within households. Yet, it is worth noting that some of the patterns found in Table 6 are inconsistent with that alternative story. Indeed, it does not appear that the labor supply response decline monotonically in the age of the *eligible* female elderly.³⁰

Further introspection about power within families led us to speculate that age should also be an important dimension to investigate. Intuitively, one might envisage a hump-shaped relationship between age and power. Power would be lower among the very young and the very old and should peak for the middle-age group. It is unclear to us a priori whether such a peak should occur before or after 50 years old (the oldest age at which males are selected into our sample).

In Table 14, we interact the pension income with age of the prime-age male (OLS estimate in column (1) and IV estimate in column (2)) and with a quadratic in age of the prime-age male (OLS estimate in column (3) and IV estimate in column (4)). Our findings in columns (1) and (2) clearly indicate that the social pension depresses employment more strongly as working-age men get older. When we allow for a quadratic relationship with age, the point estimates on the 2 interaction terms

³⁰Such a decline in age seems nevertheless to hold for male pensioners.

does not support the idea of a hump-shaped relationship over the age range under study (16 to 50). Neither of the 2 interaction terms are statistically significant.

We were also interested in analyzing how the strength of family ties affect the response of working-age men to the pension. In regressions not reported here, we found that the employment of “in-laws” was significantly more depressed than the employment of men that were related by blood to the pensioners. Because we would expect more reciprocal altruism (and thus direct income transfers) between household members that are blood-related and relying on our theoretical discussion in Section 2, a tentative interpretation of this finding is that disincentive effects are playing a substantial role in African households receiving a pension. However, because the number of “in-laws” is very small (less than 1%) and such “in-laws” probably represent a very selected group of individuals, we do not wish to push these result and interpretation too far.

6 Conclusion

The South African government’s state pension program was introduced as a way to improve living conditions for older individuals that are no longer active in the labor force and that do not have access to a private pension. The vast majority of the older-age Africans in South Africa are participating in this pension program. This paper provides some evidence that, in practice, at least part of the cash transfers that are targeted to the pensioners by the South African government end up in the hands of a group that was not the originally targeted one: working-age men that cohabit with pensioners. We find that African men between 16 and 50 years old reduce their labor supply when they live with pension beneficiaries.

The findings in this paper provide an important message for policy makers in developing coun-

tries. Because of intra-family redistribution, apparently harmless targeted programs can dramatically alter the behavior of non-targeted groups and potentially lead to large drops in economic activity and growth. In order to better predict the relevance and magnitude of such effects when designing new policies, a better understanding of the determinants and structure of intra-household redistribution will be crucial.

Bibliography

- Ardington, Libby and Frances Lund, 1994, "Pensions and Development: the Social Security System as a Complementary Track to Programs of Reconstruction and Development," Centre for Social and Development Studies, University of Natal, Durban.
- Andreoni, James and Vesterlund, Lise, 1998, "Which Is the Fair Sex? Gender Differences in Altruism," Working paper, University of Wisconsin.
- Becker, Gary, 1981, *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Berhman, Jere, Robert Pollack and Paul Taubman, 1995, "The Wealth Model: Efficiency in Education and Distribution in the Family," in Jere Behrman, Robert Pollack and Paul Taubman, eds., *From Parent to Child*, Chicago, The University of Chicago Press, pp. 113-138.
- Bergstrom, Theodore, 1989, "A Fresh Look at the Rotten Kid Theorem—and Other Household Mysteries," *Journal of Political Economy*, v. 97, no. 5, pp. 1138-59.
- Caelers, Di, 1998, "Noah Saves Khayelitsha's Old Folk," *Independent*, June 16.
- Case, Anne and Angus Deaton, 1998, "Large Cash Transfers to the Elderly in South Africa," *Economic Journal*, 108 (450), 1330-1361.
- Chiappori, Pierre-Andre, 1992, "Collective Labor Supply and Welfare," *Journal of Political Economy*, v. 100, n. 3, pp. 437-67.
- Deaton, Angus, 1998, *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Baltimore, The Johns Hopkins University Press.
- Dreze, Jean and Amartya Sen, 1989, *Hunger and Public Action*, Oxford, Clarendon Press.
- Duflo, Esther, 1999, "Child Health and Household Resources in South Africa: Evidence from the Old Age Pension Program," Working paper, Massachusetts Institute of Technology.
- Eckel, Catherine and Phillip Grossman, 1998, "Are Women Less Selfish than Men: Evidence from Dictator Experiments," *Economic Journal*, 30 (2), 143-158.
- Imbens, Guido, Donald Rubin and Bruce Sacerdote, 1999, "Estimating the Effects of Unearned Income on Labor Supply, Earnings, Savings, and Consumption: Evidence from a Survey of Lottery Players," NBER Working paper # 7001, March.
- Jensen, Robert, 1998, "Public Transfers, Private Transfers and the 'Crowding Out' Hypothesis: Evidence from South Africa," John F. Kennedy School of Government, Harvard University.
- Lund, Frances, 1992, "State Social Benefits in South Africa," *International Social Security Review*, 46 (1), 5-25.
- Lundberg, Shelley and Robert Pollack, 1991, "Separate Spheres Bargaining and the Marriage Market," *Journal of Political Economy*, 101, 988-1010.
- Mc Elroy, Marjorie, and Mary Jean Horney, 1981, "Nash-Bargained Household Decisions: Towards a Generalization of the Theory of Demand," *International Economic Review*, 22, 333-349.
- Mc Elroy, Marjorie, 1990, "The Empirical Content of Nash-Bargained Household Behavior," *Jour-*

- nal of Human Resources*, 25, 559-583.
- Ngoro, Blackman, 1998a, "Retiring to Life in Shackland," *Independent*, July 20.
- Schultz, Paul, 1990, "Testing the Neoclassical Model of Family Labor Supply and Fertility," *Journal of Human Resources*, 25 (4), 599-634.
- Strauss, John and Duncan Thomas, 1995, "Human Resources: Empirical Modelling of Household and Family Decisions," in Jere Behrman and T.N. Srinivasan, eds., *Handbook of Development Economics*, Amsterdam, Elsevier, 1883-2023.
- Thomas, Duncan, 1990, "Intra-Household Resource Allocation: An Inferential Approach," *Journal of Human Resources*, 25 (4), 635-664.
- Van den Berg, Servaes, 1994, "Issues in South African Social Security," mimeo, The World Bank.

TABLE 1
Descriptive Statistics:
African Males, 16 to 50 Years Old
Three-Generation Households

Means and Standard Deviations^a

<i>Sample:</i>	All HHs		Age-Eligible HHs		Non Age-Eligible HHs	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
<i>Variable:</i>						
Age	26.7	8.9	27.3	8.7	26.0	9.0
Employed	.261	.439	.231	.421	.299	.458
Unemployed	.096	.294	.103	.304	.086	.281
Discouraged	.233	.423	.252	.434	.211	.408
4th Grade or More	.741	.438	.728	.445	.757	.429
8th Grade or More	.328	.470	.306	.461	.355	.479
Matric or More	.133	.340	.126	.332	.143	.350
Household Size	8.98	3.60	9.13	3.81	8.79	3.31
Rural	.665	.472	.692	.462	.631	.483
Urban	.174	.379	.160	.367	.191	.394
Metro	.161	.368	.147	.355	.178	.382
Sick	.059	.237	.073	.260	.043	.203
Total Income	1409	1856	1366	1293	1462	2371
Pension Income	233	284	379	275	53	167
Number of Elig. Females	.500	.522	.903	.357	0	0
Number of Elig. Males	.188	.402	.340	.490	0	0
<i>Sample Size</i>	2540		1406		1134	

^aNotes: Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. All variables are from the World Bank/SALDRU survey, August-December 1993.

TABLE 2

Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old Africans^a

<i>Specification:</i>	<i>Dependent Variable: Employment Dummy</i>			
	OLS (1)	OLS (2)	OLS (3)	IV (4)
Pension Income*1000	-.0509 (.023)	—	—	-.0862 (.0336)
Pension Dummy	—	-.0382 (.0111)	—	—
HH Eligibility Dummy	—	—	-.0397 (.0116)	—
Female	-.0681 (.0120)	-.0690 (.0121)	-.0692 (.0120)	-.0687 (.0121)
Age	-.3944 (.0896)	-.3942 (.0896)	-.3965 (.0896)	-.3947 (.0896)
Age ²	.0218 (.0046)	.0217 (.0046)	.0218 (.0046)	.0217 (.0046)
Age ³	-.0005 (.0001)	-.0005 (.0001)	-.0005 (.0001)	-.0004 (.0001)
Age ⁴	3.63e-6 (7.97e-7)	3.61e-6 (7.97e-7)	3.62e-6 (7.98e-7)	3.61e-6 (7.98e-7)
8th Grade or More	.0627 (.0118)	.0619 (.0118)	.0615 (.0118)	.0629 (.0118)
R ²	.1926	.1934	.1936	—
FS F-stat, test that instrs jointly equal 0	—	—	—	229.53 (p=.000)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample size in all regressions is 6312.
3. Other covariates included in regression are 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 3

Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old African Males^a

Specification:	<i>Dependent Variable: Employment Dummy</i>			
	OLS (1)	OLS (2)	OLS (3)	IV (4)
Pension Income*1000	-.0983 (.0336)	—	—	-.1921 (.0557)
Pension Dummy	—	-.0728 (.0177)	—	—
HH Eligibility Dummy	—	—	-.0842 (.0185)	—
Age	-.4793 (.1405)	-.4698 (.1407)	-.4746 (.1400)	-.4697 (.1400)
Age ²	.0276 (.0073)	.0271 (.0073)	.0272 (.0072)	.0270 (.0073)
Age ³	-.0006 (.0002)	-.0006 (.0002)	-.0006 (.0002)	-.0006 (.0002)
Age ⁴	5.14e-6 (1.26e-6)	5.01e-6 (1.26e-6)	4.99e-6 (1.26e-6)	4.99e-6 (1.26e-6)
8th Grade or More	.0761 (.0193)	.0735 (.0192)	.0721 (.0190)	.0765 (.0194)
R ²	.2345	.2371	.2390	—
FS <i>F</i> -stat, test that instrs jointly equal 0	—	—	—	163.52 (p=.000)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 4
Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old African Females^a

<i>Specification:</i>	<i>Dependent Variable:</i> <i>Employment Dummy</i>			
	OLS (1)	OLS (2)	OLS (3)	IV (4)
Pension Income*1000	-0.0137 (.0292)	—	—	-.0071 (.0424)
Pension Dummy	—	-.0126 (.0139)	—	—
HH Eligibility Dummy	—	—	-.0079 (.0141)	—
Age	-.3789 (.1132)	-.3802 (.1128)	-.3794 (.1129)	-.3784 (.1131)
Age ²	.0202 (.0058)	.0203 (.0058)	.0202 (.0058)	.0202 (.0058)
Age ³	-.0004 (.0001)	-.0004 (.0001)	-.0004 (.0001)	-.0004 (.0001)
Age ⁴	3.15e-6 (9.88e-7)	3.15e-6 (9.87e-7)	3.15e-6 (9.87e-7)	3.15e-6 (9.88e-7)
8th Grade or More	.0514 (.0140)	.0513 (.0140)	.0512 (.0140)	.0513 (.0140)
R ²	.1783	.1784	.1783	—
FS <i>F</i> -stat, test that instrs jointly equal 0	—	—	—	232.38 (p=.000)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African females between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 3772.
3. Other covariates included in regression are 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 5

Effect of Old Age Pension Income on
Unemployment, LFP and Discouragement of
16 to 50 Year Old African Males ^a

<i>Dep. Var.</i>	<i>Unemp</i>		<i>LFP</i>		<i>Discr</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
<i>Specification:</i>	(1)	(2)	(3)	(4)	(5)	(6)
Pension Income*1000	.0008 (.0234)	.0337 (.0387)	-.0975 (.0377)	-.1584 (.0585)	.0156 (.0419)	.0196 (.0647)
Age	-.0129 (.1026)	-.0162 (.1023)	-.4921 (.1515)	-.4859 (.1518)	.6155 (.1556)	.6151 (.1560)
Age ²	.0029 (.0053)	.0031 (.0053)	.0305 (.0078)	.0301 (.0078)	-.0273 (.0078)	-.0273 (.078)
Age ³	-.0001 (.0001)	-.0001 (.0001)	-.0007 (.0002)	-.0007 (.0002)	.0005 (.0002)	.0005 (.0002)
Age ⁴	8.48e-7 (9.00e-7)	8.99e-7 (8.98e-7)	5.99e-6 (1.35e-6)	5.89e-6 (1.35e-6)	-3.86e-6 (1.27e-6)	-3.86e-6 (1.28e-6)
8th Grade or More	-.0324 (.0134)	-.0325 (.0134)	.0437 (.0200)	.0440 (.0200)	-.1346 (.0208)	-.1346 (.0208)
R ²	.0557	—	.2578	—	.0851	—

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. *Unemp* is a dummy variable that equals 1 if the individual is unemployed; *LFP* is a dummy variable that equals 1 if the individual is in the labor force; *Discr* is a dummy variable that equals 1 if the individual is discouraged.
3. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
4. Other covariates included in regression are 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
5. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 6

**Effect of the Presence of Elderly on
Employment Status of
16 to 50 Year Old African Males ^a**

*Dependent Variable:
Employment Dummy*

	(1)	(2)	(3)	(4)	(5)
Number of 50 to 55 Persons in HH	.0079 (.0171)	.0051 (.0173)	.0032 (.0174)	—	—
Number of 50 to 55 Females in HH	—	—	—	.0066 (.0265)	.0046 (.0267)
Number of 50 to 55 Males in HH	—	—	—	-.0044 (.0284)	-.0050 (.0285)
Number of 55 to 60 Persons in HH	-.0019 (.0190)	-.0060 (.0209)	-.0070 (.0209)	—	—
Number of 55 to 60 Females in HH	—	—	—	-.0107 (.0304)	-.0155 (.0304)
Number of 55 to 60 Males in HH	—	—	—	-.0052 (.0267)	-.0043 (.0270)
Number of 60 to 65 Persons in HH	-.0295 (.0178)	—	—	—	—
Number of 60 to 65 Females in HH	—	-.0442 (.0234)	-.0445 (.0233)	-.0465 (.0252)	-.0548 (.0259)
Number of 60 to 65 Males in HH	—	-.0051 (.0336)	-.0064 (.0339)	-.0069 (.0351)	-.0050 (.0349)
Number of Persons in HH Older than 65	-.0468 (.0157)	-.0469 (.0157)	—	—	—
Number of 65 to 70 Persons in HH	—	—	-.0665 (.0234)	—	—
Number of 65 to 70 Females in HH	—	—	—	-.0710 (.0306)	-.0813 (.0296)
Number of 65 to 70 Males in HH	—	—	—	-.0599 (.0324)	-.0585 (.0322)
Number of Persons in HH Older than 70	—	—	-.0346 (.0165)	-.0348 (.0166)	—
Number of Females in HH Older than 70	—	—	—	—	-.0588 (.0246)
Number of Males in HH Older than 70	—	—	—	—	-.0066 (.0269)
R ²	.235	.236	.237	.237	.237

^aNotes:

- Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
- Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
- Other covariates included in regression are a quartic in age, a dummy for completion of at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.

TABLE 7

Effect of Old Age Pension Income on
 Employment Status of
 16 to 50 Year Old African Males:
 Control for Number of Old People That Are Sick ^a

*Dependent Variable:
 Employment Dummy*

<i>Specification:</i>	OLS	IV
	(1)	(2)
Pension Income*1000	-.0915 (.0343)	-.1836 (.0568)
Number of People over 50 in HH That are Sick	-.0310 (.0187)	-.0236 (.0191)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented. The instruments are the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 8

**Effect of Old Age Pension Income on
Employment of 16 to 50 Year Old African Males:
Sensitivity to Sample Choice ^a**

<i>Dependent Variable: Employment Dummy</i>				
<i>Sub-Sample:</i>	2nd Generation Only		Maximum Age in HH>50	
<i>Specification:</i>	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Pension Income*1000	-.0592 (.0407)	-.1507 (.0707)	-.0630 (.0362)	-.1330 (.0634)
Sample Size	1921	1921	2115	2115

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. In columns (1) and (2), the sample is limited to the set of males between 16 and 50 years old that belong to the second generation in a three-generation household. In columns (3) and (4), the sample is limited to the set of males between 16 and 50 years old that live in a three-generation household where the oldest person is at least 50 years old. Sample Size is 1921 in columns (1) and (2), 2115 in columns (3) and (4).
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 9

Effect of Old Age Pension Income on
Education Level
of 16 to 50 Year Old Males ^a

<i>Dependent Variable:</i>	<i>4th Grade +</i>		<i>8th Grade +</i>		<i>Matricp +</i>	
<i>Specification:</i>	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Pension Income*1000	.0263 (.0343)	.0035 (.0575)	.0112 (.0385)	-.0787 (.0590)	-.0210 (.0250)	-.0485 (.0439)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 10

Effect of Old Age Pension Income on
Migration of
16 to 50 Year Old African Males^a

*Dependent Variable:
Migration Dummy*

<i>Specification:</i>	OLS		IV	
	(1)	(2)	(3)	(4)
Pension Income*1000	-.022 (.013)	—	—	.014 (.028)
Pension Dummy	—	-.0111 (.0084)	—	—
HH Eligibility Dummy	—	—	.0075 (.0106)	—
R ²	.085	.085	.085	—

^aNotes:

1. The dependent variable "migration" is a dummy variable that equals 1 if the person "move(d) here during the past five years."
2. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
3. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
4. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
5. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 11

Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old African Males:
Interaction With Household Size ^a

*Dependent Variable:
Employment Dummy*

<i>Specification:</i>	OLS		IV	
	(1)	(2)	(3)	(4)
Pension Income*1000	-.2311 (.0874)	-.1599 (.0597)	-.3943 (.1315)	-.2806 (.2619)
Pension Income*1000* Household Size	.0141 (.0088)		.0211 (.0125)	
Household Size	-.00609 (.00539)	.00727 (.00619)	-.00380 (.0061)	.01693 (.0185)
Pension Income*1000* Number of 16 to 50 Year Old Males in HH		.0237 (.0262)		.0302 (.1001)
Number of 16 to 50 Year Old Males in HH		-.0296 (.01111)		-.0443 (.0641)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample Size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income and the interaction of pension income with the measure of household size are instrumented. The instruments are the number of age-eligible women in the household and the number of age-eligible men in the household as well as the interactions of these variables with the household size measure.

TABLE 12

**Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old African Males:
Interaction With Education ^a**

*Dependent Variable:
Employment Dummy*

<i>Specification:</i>	OLS		IV	
	(1)	(2)	(3)	(4)
Pension Income*1000	-.1264 (.0311)	-.2169 (.0514)	-.0687 (.0331)	-.1632 (.0515)
Pension Income*1000* Matric or More	.2247 (.0788)	.1659 (.1129)	—	—
Matric or More	.0701 (.0327)	.0810 (.0375)	—	—
Pension Income*1000* 4th Grade or Less	—	—	-.0126 (.0630)	-.1423 (.1034)
4th Grade or Less	—	—	-.0222 (.0247)	-.0192 (.0314)

^aNotes:

1. Standard errors are in parentheses.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income and the interaction of pension income with the education measure are instrumented. The instruments are the number of age-eligible women in the household and the number of age-eligible men in the household as well as the interactions of these variables with the education measure.

TABLE 13

Effect of Old Age Pension Income on
 Labor Force and Employment Status of
 16 to 50 Year Old African Males:
 Female vs. Male Pensioners^a

<i>Dependent Variable:</i>	<i>Employment</i>	<i>Labor Force</i>
	(1)	(2)
Number of Eligible Women	-.0587 (.0169)	-.0575 (.0191)
Number of Eligible Men	-.0272 (.0221)	-.0073 (.0235)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specification, pension income is instrumented with the number of age-eligible women in the household and the number of age-eligible men in the household.

TABLE 14

**Effect of Old Age Pension Income on
Employment Status of
16 to 50 Year Old African Males:
Interaction With Age of Individual ^a**

*Dependent Variable:
Employment Dummy*

<i>Specification:</i>	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Pension Income*1000	.2248 (.0959)	.2473 (.1261)	-.2482 (.3295)	-.3926 (.4940)
Pension Income*1000* Age	-.0122 (.0038)	-.0167 (.0053)	.0224 (.0259)	.0298 (.0379)
Pension Income*1000* Age ²	—	—	-.0006 (.0004)	-.0008 (.0006)

^aNotes:

1. Standard errors are in parentheses. Standard errors are corrected to allow for group effects within SALDRU household clusters.
2. Sample is composed of set of African males between 16 and 50 years old that live in a three-generation household. Sample size in all regressions is 2540.
3. Other covariates included in regression are a quartic in age, a dummy for completing at least 8th grade, 14 province indicators, 3 metro indicators (urban, rural and metro), household size, number of household members aged 0-5, 6-15, 16-18, 19-21, and 22-24.
4. In the IV specifications, pension income and the interaction of pension income with age or age and age² are instrumented. The instruments are the number of age-eligible women in the household and the number of age-eligible men in the household as well as the interactions of these variables with age or age and age².