

State Pensions and Labour Market Dynamics in South Africa

Katherine Geel
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University of Cape Town

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Abstract

State pensions in South Africa are characterised by their generosity. The current level is approximately double the median per capita income of Africans in 1993. It is possible that pension receipt in a household could have a strong effect on labour market outcomes. This paper investigates the effects of access to pension income on labour supply and employment probability. The large negative elasticity of labour supply to pension income found in Bertrand, Mullainathan and Miller (2003) is much reduced, although the employment probability elasticity has increased in size. Eligible households are characterised by larger household size, higher unemployment levels, lower numbers of prime age workers present in the household, and on average younger members. These patterns tie in with our hypothesis that pension income is used to fund migration and job search, and thus a true picture of the effect of pension payments on labour supply must take this into account. We also investigate the effect of membership of a social network on employment probability. We find that network membership enables individuals to overcome the negative effect of pension income on employment probability.

1 Introduction

South Africa is characterised by a very generous social pension scheme, in which those eligible receive amounts which are equivalent to roughly double the median per capita income of African households¹ in 1993 (Lam et al., 2004). The state pension is non-contributory, and is available to men from the age of 65, and women from the age of 60. We refer to this group as eligible, or eligible elderly from this point. The pension is means tested, although for many black pensioners, the test is set so high as to be irrelevant (see table 1). The means test is conducted solely for those in the household who are eligible for pensions, thus changes in other household members' income cannot affect an individual's pension receipt (Inder and Maitra, 2004). Very high percentages of African eligible elderly take up the pension (see table 1), compared to members of other race groups, who

*School of Economics, University of Cape Town, Private Bag Rondebosch, 7701, Cape Town. The author wishes to thank Malcolm Keswell and Justine Burns for comments, and the National Research Foundation and the University of Cape Town for financial support.

¹South African surveys collect data on the different population groups in South Africa. These are commonly known as Black, or African, Coloured, Indian/Asian, White and Other. Race is defined subjectively by the survey participant. The main aim in using these groupings is to be able to determine the effects of various policies on different groups, and to monitor their respective welfare. This paper will make use of the terms African and Black interchangeably to refer to the same population group.

mostly rely on private pension schemes². A large segment of Africans in 2001 report having access to pension income in their household³ compared to the actual percentage of pension recipients in the population. This is partly due to the much larger size of eligible households.

Possible behavioural responses to the presence of pension income in the household include changes in individual labour supply, savings behaviour, labour force status, nutritional status of dependents, household size, household structure, and many others. The main question under investigation in this paper is whether there are serious impacts on individual labour force participation and labour supply due to state pensions. The secondary focus is on household composition and changes in household size. Following Bertrand et al. (2003) we examine whether pensions negatively affect labour supply within households which have age-eligible members, using data from the 2001 and 2002 Labour Force Survey⁴ (LFS). In the first part of our analysis, we recreate almost exactly the analysis in Bertrand et al. (2003). We calculate the effect of pension income on labour supply and employment status, including a break down of possible gender effects. In addition, we estimate tobit and probit models of labour supply and employment probability. We then attempt to use the panel nature of the LFS data in two ways. We employ a difference-in-difference estimator of the average effect of time and a change in household eligibility status on individual labour supply, and household size. We also make use of a simple dynamic model of employment status, including social network effects.

We find that the large negative labour supply response to pension income has declined since 1993. The large negative employment elasticity has increased in size and the strong gender effects which were present in the SALDRU⁵ data set persist in 2001. In our simple dynamic employment model, the negative effect of pension income on employment probability is partially cancelled out by the positive nonlinear effect of pension income and social network membership.

The outline of this paper is as follows. Section 2 examines the evidence surrounding pensions and their effect on labour market outcomes. Section 3 presents a basic theoretical framework, and section 4 the empirical framework, and estimation results. We also discuss data issues and the matching algorithm used to construct a partial panel from 2 waves of the Labour Force Survey in section 4. The results are discussed in section 5. Section 6 concludes.

2 Clarifying the link between Pensions and Labour Supply

2.1 Do eligible household members have a lower rate of employment?

If pensions have an effect on labour supply of prime⁶ working age household members, this is evidence of income transferral between household members (Bertrand et al., 2003), and may show that pensions are not being utilised in full by the targeted group. Lam et al. (2004) find that pension

²Most race groups other than Africans would not pass the means test for the state pension.

³This may be through their own pension income, or someone else in the household receiving a pension, or through pension income being sent to the household as remittance income.

⁴This survey has been conducted by Statistics South Africa bi-annually since February 2001. In 2001, approximately 70 000 adults of working age (15-65) were surveyed. Information was collected on employment in both the formal and informal sectors, and on unemployment (Labour Force Survey Official Release Notes, 2001).

⁵The South African Development Research Unit, at the University of Cape Town in conjunction with the World Bank collected data from 9000 households in 1993 on a variety of socio-economic variables (Bertrand et al., 2003).

⁶Prime working age is between the ages of 16 and 50 years of age.

recipients do have a lower rate of employment than eligible elderly who do not receive the pension. Bertrand et al. (2003) find a strongly significant negative labour supply and employment probability response of prime working age individuals to other household members' pension receipt or eligibility status. Reduced labour force participation, search behaviour, and the probability of employment are found in eligible households by Klasen and Woolard (2000). The presence of elderly persons in the household may also imply a reduction in household labour supply if the pension recipient requires caretaking⁷. A typical response to a household member becoming eligible is the migration of unemployed relatives into the household. As many of these eligible households are in rural areas, these individuals are lowering their employment chances by moving into areas with much higher unemployment levels than cities (Klasen and Woolard, 2000). On average then, we see a fall in the percentage of employed people in the household, due to these changes in household formation. Changes in household formation, and the role that gender plays in the allocation of pension resources are important factors in determining the link between pensions and labour supply.

2.2 Migration and Gender Effects

Since the abandonment of influx control around 1993, migration and particularly female migration has risen in South Africa (Pose! and Casale (2002b), Inder and Maitra (2004)). Moreover, recent evidence suggests that pension income has been used in part to fund this migration, and migrant workers have maintained ties with households by remitting income (Pose! and Casale (2002b), Pose! et al. (2004))⁸. Pose! et al. (2004) question the interpretation of the results found in Bertrand et al. (2003). Using the same data set, the authors find that the manner in which the household is defined has a strong impact on the results. When the household is defined broadly, including migrant household members⁹, pension income in the household has a strong positive effect on the probability that rural African women leave to become migrant workers, and this effect is strongest when the pension recipients are female. Pension income can help women to mitigate the costs of search, and the costs of childcare¹⁰ (Pose! et al., 2004). Eligible households are characterised by higher numbers of children, and the exodus of older prime working age women, who have higher market value than younger women, due to their higher job skills and experience levels (Edmonds et al., 2004)¹¹.

On the other hand, pension payments may reduce the need to migrate, if migration is viewed as a risk reduction strategy, by diminishing the correlation between parent and child income (Jensen (2003), Inder and Maitra (2004)). Jensen (2003) does not find any evidence of significant pension effects on migration or labour supply and household structure, which may be explained by the relative poverty of the households under examination (Jensen, 2003), although the relatively small size of the sample in Jensen (2003) may limit our ability to generalise from the author's results.

⁷Although the caretaker may in turn be supported by the pensioner's income, and is therefore supplying labour which may not be picked up by the Labour Force Survey.

⁸Migrants maintain ties for the purpose of retirement, and because urban areas are viewed as too dangerous to bring families to (Pose! and Casale, 2002b).

⁹Those individuals who have spent at least 15 days in the household in the past year

¹⁰More support for this hypothesis is provided in Ray and Maitra (2001), Edmonds et al. (2004), Inder and Maitra (2004) and others.

¹¹The authors also find that the increase in the number of children under the age of 5 in the household is accompanied by a coincident rise in the number of young women aged 18-24 (the women likely to be the mothers of those children).

The gender of the pension recipient is important when determining the nature of pension effects. Many studies of labour supply conclude that female labour supply is much more responsive to changes in non-wage and wage income than male labour supply (Berndt, 1996). The presence of a pension eligible women in the household often has a positive effect on prime age female labour supply (Inder and Maitra (2004), Pose! and Casale (2002a)). Besides labour supply, pension income may also affect the nutritional status of household members. Duflo (2003) finds that only when the pension recipient is female, do we find positive effects on the nutritional status of girl children in the household¹². These gender effects in households often relate to resource sharing and bargaining power in the household.

2.3 Household Structure and Resource Sharing

The effect of pensions on labour supply is related to how household structure changes due to a change in eligibility status. Household structure may change if household members' share their resources (Ray and Maitra, 2001). Household structure and resource sharing may differ depending on whether households are maximising a common utility function, the relative bargaining power of household members, whether altruism is the guiding force in the household, and the gender of the main income earner. Depending on these factors, pension income may be transferred to prime age workers in the household¹³ (Bertrand et al., 2003).

In general, it is difficult to identify the causality between household formation and income¹⁴. We may see an influx of individuals into the household upon a member becoming eligible, such as unemployed¹⁵ relatives (Klasen and Woolard, 2000), children (Edmonds et al., 2004), HIV positive relatives needing support and care (Nattrass, 2004), and others. We may also see the ex migration of individuals who make use of some pension funds to search for work (Posel and Casale, 2002a). Edmonds et al. (2004) document the existence of elderly people in other developing countries who are able to establish or maintain their independence due to pension payments. This type of scenario is unlikely in South Africa, for the above mentioned reasons. The persistent high levels of unemployment support the theory that unemployed individuals move into eligible households in order to take advantage of pension income, rather than the alternate hypothesis that existing members of the household become unemployed when the household becomes eligible.

A large number of pensioners live in three-generational households¹⁶. It is generally thought that

¹² Boy children may traditionally be given primary access to household resources, due to the patriarchal nature of households. An increase in household resources due to state transfers may enable mothers or grandmothers to care for boy and girl children more equitably.

¹³ This could reflect a lack of proper benefits for other needy individuals in society, such as the unemployed or disabled. It may be that pensions are acting as substitutes for unemployment benefits in South Africa.

¹⁴ The question is whether labour market outcomes influence household formation, with the unemployed moving back home, or whether it is that the unemployed have never left home, because of income constraints. Does household structure affect income, or does income affect household structure? The particular structure of the age eligibility rules, and the fact that pension eligibility is not dependant on household structure, makes it possible to use the discontinuity in age/pension receipt to identify this effect (Edmonds et al., 2004).

¹⁵ A large proportion of the total unemployed are found in eligible households (Klasen and Woolard, 2000). The unemployed are clearly not the intended targets of the old age pension, and their presence in the household lowers overall household welfare. Without the state pension, many of these households would be facing destitution, although it is difficult to determine what their position would have been prior to both pension receipt and the influx of relatives etc.

¹⁶ This has been documented in Bertrand et al. (2003), Ardington and Lund (1995), Case and Deaton (1998) and

the presence of so many multi-generation households could be due to the failure of young adults to leave the household because of adverse labour market and general economic conditions (Keller (2004), Edmonds et al. (2004)). Household composition definitely changes when pension income is anticipated in the years after 1993 (Edmonds et al., 2004), and we see the influx of even more children, especially those under 5 years of age¹⁷.

3 Theoretical Framework

3.1 Basic Model

We investigate the manner in which the agent makes the labour market participation decision, and the labour supply decision, given that they have decided to participate. These decisions are made by the agent after finding the solution to the following constrained utility maximisation problem (Berndt, 1996):

$$\text{Max } U(G, L) \quad \text{such that} \quad PcG = P_L H + V = P_L(T - L) + V \quad (1)$$

The agent's utility function $U(G, L)$ depends on their level of consumption of goods G and hours of leisure L . This utility function is well behaved, in that it is twice differentiable, where the first derivatives ($MU_L = \partial U / \partial L$ and $MU_G = \partial U / \partial G$) are assumed to be positive, and the utility function is concave ($\partial^2 U / \partial L^2 < 0$, $\partial^2 U / \partial G^2 < 0$ and $\partial^2 U / \partial L \partial G > 0$). We assume that the agent spends all available income. Thus the amount spent on consumption (PcG), must equal the sum of non-wage income (V) and wage income ($P_L H$) where H is the number of hours spent working. H is related to leisure as follows: $L + H = T$, where T is the maximum number of hours available to the agent. The slope of the budget line is the real wage (P_L / Pc). The optimal level of consumption and leisure is found where the marginal rate of substitution of leisure for consumption goods (MU_L / MU_G) is equal to the price ratio P_L / Pc , i.e. at the point of tangency between the agent's budget line and the highest attainable indifference curve. At this point, the marginal rate of substitution between consumption and leisure is equal to the slope of the budget line, i.e. the real wage. Equilibrium can occur either at an interior solution point, where $H > 0$, and $L < T$, or at a corner solution, where $H = 0$, and $L = T$ (Berndt, 1996). At the interior solution, the individual has made the decision to participate in the labour market, and has then chosen an optimal level of labour to supply. At the corner solution, the reservation wage w^* (the MRS_{LC}) is higher than the market wage (the slope of the budget line), and the agent decides not to participate in the labour market.

others. We also find that 77% of households contain three generations in 2001 (source: Labour Force Survey).

¹⁷ Case and Deaton (1998) find that 32% of African children live with a social pensioner, and that this percentage increases with the poverty level of the household. These findings cannot be seen as the result of children being moved into households with pensioners, as the paper uses data from 1993, the year of equalisation. It seems safe to assume, as the authors have done, that this is a pre-existing tendency among poor households. The pension reaches un-targeted but none-the-less vulnerable groups, such as children.

3.2 Basic Theoretical Prediction of the Effect of Pension

3.2.1 Why might pensions negatively affect labour supply?

When an individual receives extra non-wage income V (e.g. pension income), this model predicts that the individual will tend to reduce labour supply, by substituting leisure for labour. The model operates on the assumptions of perfect information and mobility of workers, and full employment. Workers make their labour supply decision based on information about wages, prices and non-wage income (Killingsworth, 1983). Extra non-wage income will allow the worker to afford the same bundle of goods, while working fewer hours. This income represents a shift outwards in the budget line, and thus the attainment of a higher indifference curve. A rise in V is a simple income effect, which can increase consumption of both goods (leisure and work hours), if we assume that these are normal goods. Extra income does not change relative prices.

Upon pension takeup, the pensioner's reservation wage¹⁸ will increase, without any change in their current wage rate. An increase in the reservation wage will tend to make individuals accept fewer job offers, as a greater proportion of these offers will not exceed their reservation wage. The individual's bargaining power compared to that of their prospective employer will have increased, as well as their bargaining power in the household¹⁹. This will be the case if the extra income is regular, and is not regarded as a windfall. In 1993, when pension payments for Africans had been scaled upwards to match those of white pensioners, it is possible that at first these payments would seem like windfalls, especially given prevailing attitudes to the current regime. After eight years of regular payments, and a change of government, we might assume this income to be regarded as certain, and it may even have been regarded as such since 1993. Regardless, it is important to verify the results in Bertrand et al. (2003) using a more recent data set, and particularly one which is designed specifically for labour market analysis such as the Labour Force Survey.

3.2.2 Why might we observe a larger effect on employment probability than on hours worked?

Pension takeup may reduce labour market participation, especially if the individual observes a low range of wage offers, as might be the case in South Africa. The impact on prime working age household members and their labour supply depends on the method of resource sharing in the household. If households are assumed to maximise a common utility function, and to share resources equally, we could possibly expect to see a decline in the labour supply or labour market participation rate of prime age workers present in the household. This effect will be smaller than if the worker directly receives the full pension amount, given the assumption of equal resource sharing. The decision to participate and to supply labour are also not simultaneous, as assumed by the standard model, especially not in an economy with high unemployment. The worker must first be offered a job, and then decide how many hours of labour to supply. Given that the participation decision is made first, and the labour supply decision second, we would expect pension income to have a greater effect on employment status than on labour supply, especially if workers' command over their work hours agreement is limited.

¹⁸The wage at which they are just indifferent between working and unemployment.

¹⁹Unless the person traditionally does not have high status in the household, in which case they will have little say over the distribution of their pension. Bertrand et al. (2003) cite the low bargaining power of women as a reason why their pension payment makes such an impact on labour supply in the household.

3.2.3 The Added Worker Effect

The increase in income due to pension receipt may imply either a fall or a rise in household labour supply due to the added worker effect, which is particularly prevalent in periods of high unemployment (Killingsworth, 1983). This effect describes the addition into the labour force of extra workers, who have decided to rejoin the labour force. Workers may feel that they have a greater chance of finding employment, due to a change in economic climate, their qualifications, or their need to find work. Spouses may find that the reduction in their reservation wage caused by a loss of their partners' wage income may propel them into the work force (Killingsworth, 1983). Social mores may also have changed, making it more acceptable for certain groups to join the labour force, such as women. For these reasons, we expect labour force participation rates to rise with unemployment (Berndt, 1996). The added worker effect has been documented in Pose! and Casale (2002b), who find a high rise of female participation in the economy since 1995. However, when a household starts to receive pension income, household labour supply may fall, because of the added worker effect. Spouses may find their position has improved to such an extent that they no longer feel the need to work. Each household faces the conflicting effects of high unemployment conditions, and the arrival of pension income into the household.

3.3 Hypothesised Deviations from the Theoretical Prediction

3.3.1 Heterogenous Preferences and Local Conditions

Differences in tastes may also matter in labour supply decisions (Killingsworth, 1983). When the budget curve shifts outward due to pension receipt, we may see an individual consuming more leisure, the same amount of leisure, or less leisure, depending on the shape of their indifference curve. If the individual has a preference for consumption (i.e. work), we may observe an increase in their labour supply due to pension receipt. In addition, two individuals may have different reservation wages, if they have other sources of non-wage income, such as property income or remittances. This difference may imply that the two individuals **will** supply different levels of labour supply at the same wage, and **will** begin to supply labour at different points. Thus they will have proportionately different changes in labour supply to the same wage change. Local conditions also matter when trying to find the average response, and sometimes may have such a strong effect that preferences may seem homogenous. In South Africa, the existence of high unemployment, and widespread poverty give us a base for our expectations. Given the small informal sector, the main proportion of workers will be formal sector employees. Therefore changes in labour supply might affect overtime, but in all likelihood will not affect the agreed upon weekly hours total, as this could jeopardise job security²⁰. High unemployment conditions imply that the extra utility associated with actually having a job might also keep labour supply stable.

3.3.2 Is Leisure an Inferior Good?

As previously mentioned, there may exist a preference for work. Many pensioners, especially males, may have been the chief income earner in their household. Upon reaching eligibility, pensioners may not wish to lose the prestige, and weight in household decision making that being the primary

²⁰Labourers may be subject to a take-it-or-leave-it offer regarding weekly hours, or a take-it-or-leave-it range of hours (Killingsworth, 1983).

earner conveys. This may especially be the case when formal employment is rare. Thus extra income does not always have to change labour supply²¹ (Killingsworth, 1983). Measures of job satisfaction, pride in providing for family and other similar effects which may be important determinants of labour supply, are not often captured or measured, or included in econometric models (Killingsworth, 1983). The assumption that leisure is a normal good may not be relevant in our high unemployment context, where persistent unemployment is the norm. Leisure may be regarded as an inferior good when the individual has been unemployed for many years. Thus the income effect of pension receipt may not necessarily imply a decrease in labour supply.

3.3.3 Time Cost of Work

Another factor which could possibly affect labour supply is that of the time cost of working. If we examine individuals who live in eligible households, we will see that they are generally more likely to be located in rural areas (table 2). The time cost of commuting to work, in particular from a rural area, may reduce the labour supply of an individual. Thus we might already expect to see a lower average value of labour supply for members of eligible households for this reason alone. However, the increase in household income due to the pension may lower the relative time cost of working, and thus may even result in higher hours of work

3.3.4 Intra-household Substitutability of Work Hours

Another factor to consider is whether the labour supply of family members are complements or substitutes (Killingsworth, 1983). If a rise in non-wage income is associated with a fall in the pensioner's labour supply, and labour supply is complementary, then we will see an overall fall in household labour supply. However, if household members' labour supplies are substitutes, pension income may not imply a fall in labour supply, as the reduction in the pensioner's labour supply may mean that other household members can increase their own labour supply (i.e. if the pensioner can now look after children, then prime age mothers can now work outside the home). Evidence of this has been noted in the high numbers of children resident in eligible households, and the rise in female migration (Case and Deaton (1998), Pose! and Casale (2002b)). This would imply that households are maximising a joint utility function, and thus the effect of pension income on labour supply is distributed to all household members.

4 Empirical Framework

4.1 Data and Matching Algorithm

Data in the labour force survey is investigated using three methods. Firstly, the analysis from the Bertrand et al.'s (2003) paper is re-calculated with minor modifications, using the 2001 Labour Force Survey data. OLS and probit regressions on employment status, and OLS and tobit²² regressions on

²¹Those working very low-paid and unpleasant jobs may drop out of the labour force when they receive their pension. What proportion they form of the total would need to be measured.

²²Bertrand et al. (2003) only make use of ordinary least squares estimates. Using more econometrically correct techniques, such as a probit for unemployment status, and a tobit for hours worked, should result in more accurate results. The high unemployment figures in 2001 imply that many people in the sample could be expected to have zeroes for labour supply.

labour supply data (hours worked in the previous week) are estimated²³. The sample used includes African individuals, who are of prime working age, and who live in three-generation households²⁴. We use three-generation households to ensure that the age of the elderly is the only source of variation in the data.

Data for the Labour Force Survey is collected every six months, in February and September. The survey is a rotating panel, with a replacement rate of 20% in each wave. The pilot round of data was collected in February 2000, by Statistics South Africa. The purpose of this survey is to collect detailed information about the labour market dynamics of employment and unemployment, including strict and broad unemployment, in the formal and informal sectors (Labour Force Survey Official Release Notes, 2001). It is difficult to work with the first three waves of the LFS as a panel, as the person codes used shift over time, and are replaced as a person leaves the household. Attempts to merge the waves of the LFS from wave 1 to 3 using only household and person ID do not succeed in matching household members. This problem however is slightly less present in waves 4 and 6 (the data used in this paper, September 2001 and 2002). To avoid the problem of incorrectly matching observations, we match on a number of fixed personal characteristics²⁵. In this way, we can ensure that we do not exclude those person codes that have been re-used once a household member leaves the household. It must be said however that this is a first attempt at using the Labour Force Survey as a panel, and therefore these results, particularly the dynamic models, should be interpreted with caution, as selection effects have not been controlled for.

4.2 Summary Statistics

Unlike the data presented in Bertrand et al. (2003) in 1993, there are statistically significant differences between eligible and ineligible households (on many of the observables) in 2001. Summary statistics are presented in table 2. The only variables with similar mean values in both groups are those relating to education levels. Average age in eligible households is about 2 years lower than average age in ineligible households²⁶, and this has changed since 1993, when there was no significant difference between average ages in each type of household (Bertrand et al., 2003), and the average age was 27.5 years.

We find a higher rate of employment in pension ineligible households, and correspondingly higher average hours worked and lower rates of unemployment. Eligible households have a 16.9% rate of employment, compared to 36.5% for eligible households. This is a remarkable range compared to the figures in 1993, which lie in a small range of between 21.2% and 24.6%. The strict unemployment rate for all households is nearly three times higher than the 1993 figure for all households, at 20.9%.

²³The LFS asks for information regarding the usual number of hours worked in a week, and the number of hours worked in the previous week. We make use of the second measure, following Bertrand et al. (2003), in order to reduce the amount of measurement error in the dependent variable.

²⁴The LFS data does not include any descriptions of relationship to household head, or any other type of family relationships. Thus the definition of a generation as equal to thirty years is used. Other racial groups besides Africans did not form a significantly large portion of the survey data in the SALDRU survey and hence are not used in Bertrand et al.'s (2003) analysis.

²⁵Strong conditions are used to ensure that data for September 2001 and 2002 are merged correctly for individuals, using matching criteria such as the individual's unique number (household number), their person number, their race, gender, language, province, whether they lived in a rural area or not, and other similarly invariant characteristics. The Labour Force Survey does not follow individuals who have moved from their previous location.

²⁶This difference is significant at the one percent level, as are the differences between all the variables in this table.

In 2001, strict unemployment is 25.3% in eligible households, compared with 19.2% for ineligible households. This is partly a feature of the large proportion of eligible households who live in rural areas (58.5% compared with 48.9% of ineligible households), and the sample under discussion (i.e. three-generation African households).

Weekly work hours on the whole are much increased²⁷ since 1993. Average hours worked in a week for all households is 27.5 hours, which is much higher than the levels found in the SALDRU data set (an increase of between 3 and 6 times depending on the type of household). Eligible households have much lower labour supply than ineligible households (17.8 hours compared to 30.3 for ineligible households), and much greater differences in the number of employed people in the household. Pension eligible households have slightly higher levels of discouraged workers (7.1%)²⁸ although the general level is low (6.4% in all households). The number of discouraged workers has fallen by a third since 1993. This is a large change, but one which corresponds with the much increased strict unemployment figures, and the added worker effect previously mentioned.

Individuals living in pension eligible households have slightly lower²⁹ levels of education, which could support the hypothesis that pension income may stimulate migration (Bertrand et al., 2003), leaving households with fewer individuals with good employment prospects. Pose! and Casale (2002a) find that for African female workers, an extra year of education raises the probability of migration by 3%. Only 22 percent of all prime working age Africans have obtained a matric, although this is roughly ten percentage points higher than the levels recorded in 1993. As expected, eligible households are much larger, and have lower income levels, than those households with no eligible elderly. Household size has fallen considerably since 1993. In all households, household size declined by approximately 3 members. This reflects increased migration since 1993. African three generation households have moved from living in predominantly rural areas (68% in 1993) to a more even split between rural and urban locations in 2001 (51% of all individuals live in rural areas). Not surprisingly, eligible households have noticeably higher numbers of pension eligible men and women (approximately 1.2 age eligible elderly per household, compared to 0.3 in all households, and down slightly from 1.3 eligible elderly in 1993). The mean pension income in eligible households is close to the value of the state pension in 2001, or R640. Pension income plays a large role in eligible households. About 36% of household income³⁰ in these households consists of pension income, up from approximately 28% in 1993. Most pension income enters the household through female pensioners, as a much higher proportion of eligible women are present in these households than men. This pattern has not changed significantly since 1993. This stems from the eligibility rule, and the tendency of women to live longer than men (Bertrand et al., 2003).

4.3 Basic Model

Three approaches are used to analyse the effect of pension receipt on labour market outcomes. We discuss the first approach below, where equations (2) and (3) show the main equations of interest.

²⁷This variable reflects total hours worked in the previous week, in both main job and any other money earning activities, including overtime.

²⁸This difference is statistically significant, at the 1% level.

²⁹The difference in the education means is only significant at the 10% level.

³⁰We cannot compare the actual income values between 1993 and 2001 as these are nominal figures.

$$Hrs = f_i(x, Peninch, Elig) \quad (2)$$

$$Emp = h(x, Peninch, Elig) \quad (3)$$

Hrs measures reported hours worked per week, and as such is an indication of personal labour supply³¹. *Emp* reflects employment status, and is zero if strictly unemployed. *Peninch* measures household pension income. *Elig* is a household level variable reflecting whether the household contains at least one pension eligible person. *x* is a vector of individual level characteristics³². These regressions are also run separately for men and women. We also estimate the effect on hours worked when we include direct measures of the presence in the household of elderly in the various age groups (persons in the household between the ages of 50 and 55, 55 and 60, 60 to 65, 65 plus, 65 to 70, 70 plus). These effects are further disaggregated into the number of women and men present in the household in these various groups. If the effects found in the 1993 data are still present, we expect to see large negative coefficients on pension income, the eligibility coefficient, and on the variables reflecting the number of women in the household over 60, and the number of men over 65.

4.4 Basic Results

Preliminary estimates of equations (2) and (3) are presented in table 3. These models examine the effect of two different measures of the presence of a pensioner in the household, namely the level of household pension income, and the presence of at least one eligible person in the household, on labour supply and employment status. Rather than using individual pension receipt, we use a measure of household pension income, to avoid the problem of endogenous pension take up (Bertrand et al., 2003). The coefficient on household pension income has been multiplied by a factor of 1000, hence the coefficient in column one of -6.635 implies that an increase of household pension income of a thousand rand is associated with a fall in individual labour supply of 6.635 hours per week. Following Posel et al. (2004), the education variable used reflects whether the individual has passed matric, rather than Grade 8, as this is a better predictor of labour supply and employment status. Columns 1 to 3 reflect Ordinary Least Squares (OLS) regressions of labour supply, while columns 4 to 6 show OLS regressions for employment status. Tobit and probit results are also calculated, and do not differ in any important way from the OLS estimates, although the OLS estimates do underestimate the effect of the pension variables³³. In column 3 and 6, pension income is instrumented for using the number of eligible men and women in the household as instruments. The number of eligible men and women in the household is strongly correlated with the level of household pension income³⁴.

³¹ This variable includes hours spent in the person's main job, including overtime, and any other hours of work in other income generating activities, including agricultural work, running own businesses, catching seafood for sale etc.

³² These include a quartic in age, a gender variable, a binary variable for whether matric (the South African term for Grade 12, the final year of secondary schooling) has been completed or not, a rural indicator, binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24), province dummies (the base category is the Western Cape), and a measure of household size. The existence of changes in household structure due to pension receipt may imply that household size should be modeled endogenously. Most econometric work has assumed that this variable is exogenous. As the effects on household composition are our secondary focus, we make this simplifying assumption in the first part of the analysis, but this is relaxed when we calculate a difference-in-difference estimator of household size.

³³ The Tobit and Probit results are available from the author upon request. These are calculated for table 3, and 4.

³⁴ These variables are significant at the one percent level in the reduced form equations (not reported here).

These two variables may also be considered exogenous, and thus pass the test to be considered valid IV's.

We see similar results for both the hours worked and employment status models. Living in a pension eligible household reduces hours worked by 7.7 hours, or employment probability by 15.6%. An increase of household pension income of a thousand rand (i.e. the effect of one more person becoming eligible for a pension) reduces hours worked by 8.5 hours and employment probability by 17.3%. All the pension variables are significant at the 1% level in these models. Women display lower levels of reported hours worked compared with men, and lower employment probability. On average they work approximately 5 fewer hours than men, and have a probability of being employed that is 5 to 8 percent lower than men. The gender variable is highly significant in all models. Possession of a matric certificate raises the probability of employment by between 5 and 7%, and hours worked by between 1.6 and 2.4 hours a week. This education effect is similar in size to the results in Bertrand et al. (2003).

As in Bertrand et al. (2003), the OLS results underestimate the effect of pension income on hours worked and employment probability, due to the positive correlation between household pension income and the number of age eligible men and women in the household. These values of between -6.635 and -8.512 for the pension income coefficients represent a drop of approximately 37 to 47% in hours worked for eligible household members. Thus the effect on labour supply at a first glance seems larger than the effect on labour market participation, although we need to look at the elasticities to confirm this. The absolute value of the coefficients compared to the 1993 results is lower (a range of between 6.6 and 8.5 compared to 12.3 and 17.0 in 1993), although again, it is the elasticities we are concerned with.

Bertrand et al. (2003) report a decreased employment probability of between 5 and 10 percent in eligible households (IV results). In contrast, in the IV results in columns 4 and 6, we observe a drop in employment probability of approximately 14 and 15% associated with a rise in household pension income of a thousand rand, or a change in household eligibility status (a member of the household becoming eligible for the pension). The employment probability coefficients have worsened since 1993³⁵.

We calculate the income elasticities of labour supply and employment status, following Bertrand et al. (2003)³⁶. A comparison of the 1993 and 2001 hours worked and employment probability income elasticities can be found in appendix table 1. On average there are 1.9 prime working age people in a three-generation African household. The number of prime age household members has fallen since 1993. Bertrand et al. (2003) mention 4.7 prime age workers per household, although household size has also fallen significantly since 1993. The percentage of prime age workers in households in 1993 and 2001 is 51% and 25% respectively. This is a very large difference, and could reflect the migration dynamics which occur in response to the pension. If individual income rises by R1000, hours worked drops by $-8.512 * 1.9$ which is a drop of -16.17 hours per week. Average hours in a pension eligible household are 44.69 (conditional on working), and average individual income is 974 (per prime working age individual in the household). Thus an elasticity of hours to income is $-8.512 * 1.9 * (0.974/44.69) = -0.35$. The elasticity for employment is similarly calculated as $-0.173 * 1.9 * (0.974/0.311) = -1.03$. The labour supply elasticity has fallen since the 1993 figure of -0.53, while

³⁵We also find very strong negative effects of pension income and eligibility on employment probability in the probit models. These coefficients are highly significant, and are between 16% and 20%.

³⁶The simplifying assumption of equal resource sharing among household members is made for the purposes of this calculation, although this has not been tested for.

the employment elasticity has almost doubled in size from -0.55 in 1993.

These results suggest that intra-household sharing may take place in eligible households. A channel may exist in households through which pension income flows to prime working age household members from pension recipients, thus affecting their labour supply and employment probabilities. Pension income may have differential effects on household members, depending on their relative bargaining power and possibly their gender. For this reason, we now estimate the same model separately for men and women. The OLS results are presented in table 4³⁷.

In both the OLS results in table 4, and the tobit and probit results, the pension variables are all significant at the 1% level. The OLS results underestimate the effects compared to the tobit and probit results, and the IV results are always larger than the models which do not take the endogeneity of pension income into account. If a woman has gained a matric certificate, this positive effect cancels out the negative effect of living in a pension eligible household. Men are affected much more than women by living in a pension eligible household. In the tobit results, an extra thousand rand of pension income reduces male hours worked by 12.525 hours per week, while having a matric has only a small positive effect on male work hours (1.847). The pension coefficients for the hours worked models have reduced in size since 1993, while the pension coefficients in the employment models have increased in size. For female labour supply, the comparative coefficients are -13.27 in 1993, and -4.208 in 2001 (a reduction in size of approximately a third), while for men, the comparative coefficients are -22.48 in 1993 compared with -12.52 (a reduction of nearly half). For employment probability, the male pension coefficients have increased only slightly (-0.201 to -0.230), and the female pension coefficients have increased approximately 5 times (-0.023 in 1993 to -0.109 in 2001). Using the OLS results in table 4 for comparison, the hours worked elasticities for men and women respectively are -0.52 and -0.17³⁸. The employment elasticities are -1.37 for men and -0.65 for women³⁹. The male labour supply and employment elasticities have not changed remarkably since 1993, with only a slight drop in labour supply elasticity, and a small increase in the employment probability elasticity. For women however, labour supply elasticity has reduced to a third of the size, and the employment probability elasticity has increased more than four times⁴⁰. The overall picture (appendix table 1) is that men are more affected by pension income than women, but overall the effect of the pension variables on labour supply has declined since 1993, and the effect on employment probability has increased since 1993.

Given the evidence in table 2, we suspect that there may be systematic differences between the members of pension eligible households and ineligible households. Following Bertrand et al. (2003) the aim of table 5 is to investigate whether these differences are significant. From table 2, we see that eligible households contain on average more children, fewer employed and are larger than ineligible households. On the whole, eligible households might contain individuals who have fewer skills, and a lower probability of finding work (Bertrand et al., 2003). The presence of such individuals may then result in a much larger effect on labour supply which may be incorrectly attributed to the pension, but actually relates to these differences. Following Bertrand et al. (2003) we explicitly include the presence of elderly eligible and non eligible people into the model, in order to disentangle the different effects which might show a resultant change in labour supply. Table 5 includes binary

³⁷The tobit and probit estimates for men and women were estimated and are available from the author upon request.

³⁸Hours worked elasticities: -12.525 * 1.9 *(0.974/44.69) and -4.208 * 1.9 *(0.974/44.69). See appendix table 1.

³⁹Employment elasticities: Men -0.230 * 1.9 *(0.974/0.311) and Women -0.109 * 1.9 *(0.974/0.311).

⁴⁰The elasticities reported in Bertrand et al. (2003) for hours worked are: -0.66 men and -0.43 women, and employment probability: -0.98 men and -0.14 women. See appendix table 1.

variables measuring the presence of eligible elderly people in the household (women over 60, men over 65), the presence of ineligible elderly (men between 50 and 65, women between 50 and 60), and categorical variables measuring the number of elderly men and women in each of the different categories above the age of 50.

We observe in columns 1a and 1b in table 5 that the presence of an eligible elderly person in the household reduces individual hours worked by between 7.7 and 9.5 hours. These effects are similar in size to the coefficients found in table 3, and the OLS and Tobit coefficients are very similar in size and significance in most of these models. These effects are in a similar range to the estimates in Bertrand et al. (2003). As in 1993, the presence of an ineligible elderly person in the household has no significant effect on hours worked. All of the effects found in table 5 are negative, although the number of elderly over the age of 65 does not have a significant effect on labour supply. None of the coefficients of the number of male elderly in the household are significant in table 5, and all are negligible in size. Most of the coefficients in table 5 are greatly reduced in size in 1993, ranging between -0.1 to -1.4, compared with the range of -0.2 to -7 hours per week in 1993⁴¹. This echoes the results found in table 4, where the effect of pension income on labour supply has decreased since 1993. The goodness of fit of these models is similar to those in Bertrand et al. (2003)⁴². The deviation coefficient is very large and negative, but is insignificant in this model. Re-estimating the model without this variable has no effect on the magnitude or significance of the coefficients.

An increase in the number of women between the age of 60 and 65 in the household has a negative effect on individual labour supply, although this effect has fallen in size from 3 hours per week in 1993 to 1 hour per week in 2001. The largest effect on labour supply besides the deviation variable are the coefficients on the number of women in the household aged 70 or over. This could possibly imply the need for caretaking due to elderly in the household, although we do not see a similar size coefficient on the number of men in the household over 70, nor are the coefficients on the number of male elderly significant. The Labour Force Survey does not collect data on illness which can be used in a similar manner to the analysis in Bertrand et al. (2003), hence we cannot unpack this further, although Bertrand et al. (2003) do not find that the health status of the elderly impacts on their results. The increasing size of the coefficients as the age of the elderly person rises was also seen in the 1993 data. It is possible that women over the age of 70 are much more frail than their male

⁴¹The coefficients in columns 2, 4, and 6 of table 5 do not sum to values seen in column 1. These variables in columns 2, 4, and 6 do not disaggregate those in column 1, as they are variables reflecting the number of individuals in those age groups in each household, while the variables in column 1 are binary variables reflecting only the presence of eligible elderly, not the number of eligible elderly in the household.

⁴²The eligibility deviation variable has a large negative effect on hours worked, although these effects are not significant. Following Bertrand et al. (2003), the deviation from the eligibility rule in the region measures the percentage of people who live in households which receive pension income where men between the ages of 60 and 65 are present, and no other eligible elderly in the household are present. This is a provincial level variable which reflects the administrative attitude to the eligibility rule in the province. We would expect delivery to be standardised in the provinces by 2001. In 1993, a not insignificant fraction of people reported receiving the pension despite not having reached the correct age for their gender. Case and Deaton (1998) find that approximately a quarter of men between 60 and 65, and a tenth of women between 55 and 60 report receiving a pension. Some officials may have found the arbitrary bias against elderly men to be something to be ignored, but this does not explain pension receipt among women before the age of 60. One explanation may be due to measurement error in ages, with survey participants rounding their age to the nearest 5 or 0 (Case and Deaton, 1998). When we find a measure for deviation from the eligibility rule, according to the method used in Case and Deaton (1998) for the 2001 Labour Force Data, it is approximately 0.5% of men, and 0.42% of women within 5 years of 65 and 60 respectively, who are receiving a pension illegally. These figures have noticeably fallen since 1993. It is possible that delivery and implementation have improved since the equalisation of payments occurred.

counterparts, and thus less able to stop the transfer of their resources to others in the household. It is only for the female elderly that we see the clear discontinuity in labour supply at the ages of eligibility, although these values are much reduced since 1993. The effect of persons in the household over the various age groups is clearly driven by the effect of an increase in the number of female elderly in the household. This is an enduring pattern since 1993, although the size of the effect is much diminished. To summarise, the effect of the eligible elderly on labour supply has decreased greatly since 1993, and the presence of male pensioners does not appear to affect labour supply in any way.

4.5 Difference-in-Differences Model

Difference-in-differences estimates of the average effect of pension eligibility on household size and labour supply are calculated. We examine the effect that the presence of a pension eligible person in the household will have on labour supply. In this analysis, the LFS data from September 2001 and 2002 are pooled, as independent cross sections⁴³. 20% of respondents in the Labour Force Survey are replaced in each round. From September 2001 to September 2002, approximately 60% of the sample will remain the same. The fact that some units of the data set may recur in the second cross section can safely be ignored (Wooldridge, 2002). Time dummies are included, to account for the passage of time. In 2SLS, these time dummies can be their own instruments, as the passing of time is exogenous (Wooldridge, 2002). The treatment group consists of individuals who live in households with a positive number of pension eligible members. We estimate the following model:

$$Hrs = \beta_0 + \beta_1 Time + \beta_2 Elig + \beta_3 Time \cdot Elig + u \quad (4)$$

Time is equal to unity in 2002. *Hrs* measures the reported number of hours worked in the previous week. *Elig* is equal to one if there is a positive number of pension eligible people in the household. β_0 captures the effect of time on the number of hours worked, for both groups. β_1 captures the possible differences between the groups before the change occurs (i.e. before the number of eligible people in the household becomes positive). u is a random error term, assumed to be uncorrelated with each of the regressors, and to have zero mean. β_3 is the main coefficient of interest. If this coefficient is significant, then there are significant differences in the number of hours worked for the different groups, after the change in eligibility status has occurred.

In Wooldridge (2002), the difference-in-differences estimator β_3 is expressed as follows:

$$\delta_1 = (\bar{Hrs}_{Elig,2} - \bar{Hrs}_{Elig,1}) - (\bar{Hrs}_{InElig,2} - \bar{Hrs}_{InElig,1}) \quad (5)$$

Elig represents the treatment group, and *InElig* represents the control group. For example, $\bar{Hrs}_{InElig,2}$ represents the average value of hours worked in year two (2002), for the control group (Ineligible). Thus the difference-in-difference estimator β_3 is the difference between the change in average hours worked for the control group, and the change in average hours worked for the treatment group, for the period between 2001 to 2002. This approach allows for both group specific

⁴³This is another method of examining the Labour Force Survey Data over time, which does not rely on the efficacy of any matching algorithm.

and time specific effects (Wooldridge, 2002). A difference-in-differences estimator is often used to analyse natural experiments. Here, although we do not entirely have two independent cross-sections, we may still safely analyse the change in differences between our two groups - eligible and ineligible households. We are in effect tracking over time the fortunes of our two types of households, and examining whether there is a systematic difference in their labour supply changes over time. Using this estimator in this way, we are able to obtain a clean test of the effect of a household's eligibility status on our variable of interest. This is a limited test however, as due to the nature of the data (a simple pooling of two independent cross sections), the difference-in-difference estimator only tells us how average work hours in the sample change when the number of eligible households changes.

4.6 Difference-in-Differences Estimates

The difference-in-differences estimates of equation (4) are presented in table 6. Estimates of the effect of eligibility on household size are also calculated. The treatment group is those individuals who live in households with at least one age eligible individual⁴⁴. The samples used in this analysis are prime age workers of all races, and a sample consisting only of African prime age workers.

The constant term reflects the average level of reported hours worked in ineligible households in September 2001. This value is 33.38 hours for all race groups, and 31.71 hours for African individuals. Average household size is slightly higher for Africans from ineligible households than for all races (4.867 persons). For the labour supply models, the coefficients on the time dummy are not significant, and thus we cannot conclusively establish what the simple effect of time passing is on hours worked. Household size shows an increase of between 0.17 and 0.22 from 2001 to 2002 for All races and for Africans. The coefficient on *Elig* represents the possible differences between the groups before the eligibility change. Prior to a household becoming eligible, its members already have a much reduced level of hours worked, between 12.6 and 13.8 hours (All and African households). The tobit coefficients in columns (3) and (4) are even higher, showing a reduced labour supply for eligible households of between 15.7 and 17.4 hours. On average, these households awaiting eligibility are 2.5 or 2.7 persons larger. These effects are significant at the one percent level. These results confirm the differences between households observed in table 2, and are confirmed again in the separate analysis of men and women mentioned below.

The fit of these difference-in-differences models is not high, although the fit of the household size model is much better than that of the other two models. The poor fit is to be expected, given that we are only looking at one possible determinant of the dependent variable. We are only interested in investigating the differences between eligible and ineligible households, and not the effect of any other potential explanatory variables.

An increase in the number of eligible households has a positive effect on labour supply, raising average weekly hours worked by between 2.6 and 3.1 hours (African and All households respectively), or between 4.0 and 4.4 hours in the tobit results. Thus on average, the change in eligibility status impacts positively on the labour supply of households. This positive change is not enough however to offset the existing disadvantage to labour supply of living in an eligible household. Household size decreases by about 0.6 on eligibility change, and this could reflect the possibility that pension income is being used to fund job search and migration. (Posel and Casale, 2002b).

⁴⁴We examine other similar treatment groups, including those households with a person over 60 in the household, and those households which contain an actual pension recipient. These results are not reported, as very similar effects are found.

We also calculate the difference-in-differences estimates for men and women separately, using an OLS estimator⁴⁵. On average, men in ineligible households have much higher levels of labour supply (7 to 8 hours more in All and African households) than women in ineligible households. The time coefficients are not significant in the labour models for both men and women. Both women and men in eligible households exhibit lower levels of work hours compared to ineligible households, although this effect is much stronger for men⁴⁶. These effects are slightly larger for African men and women in eligible households, and are slightly offset by the positive average effect of a household becoming eligible on labour supply of between 2.5 and 3.3 hours (African and All households) per week for men, and 2.9 hours per week for both types of women⁴⁷.

4.7 Dynamic Employment Model

The third part of the analysis involves another attempt at using the Labour Force Survey data as a panel. We examine some short term dynamic aspects of the labour market, as individuals adapt to the presence of eligible members in the household, using a very simple model⁴⁸. We are interested in whether pension income will have a negative effect on the probability that an individual moves from unemployment to employment. The following model is estimated:

$$y = f(x, network, pension, network * pension) \quad (6)$$

y tracks changes in employment status over the two periods, from unemployment to employment⁴⁹. Both ordinary least squares and a probit model are used in this estimation. x is a vector of individual specific characteristics, similar to those used in the first part of our analysis⁵⁰. The *pension* variable reflects either household pension income, instrumented by the number of age eligible men and women in the household (following Bertrand et al. (2003)), or access to pension income in the household. *network* reflects membership of a rotating savings and credit association (ROSCA). We include an interaction term between *network* and *pension* to test the hypothesis that the effect of pension income on labour market transitions is non-linear in ROSCA membership. We assume for the moment that whether one lives in a household with a ROSCA member is exogenous, as is household size.

⁴⁵These results are available from the author upon request.

⁴⁶Men in eligible households work on average approximately 15.9 hours less per week, and women work on average 10.1 hours less per week.

⁴⁷These coefficients are significant at the 1% level.

⁴⁸This analysis is limited, for the reasons mentioned in section 4.1.

⁴⁹ $y = 1$ if the individual moves from U to E, or $y = 0$ if they remain unemployed (U to U). Given that there are demand side factors which imply that normal search (as opposed to passive network search) is not the best method of procuring employment, we use the broad definition of employment in this model.

⁵⁰A quadratic in age (used instead of a proxy for experience following Keswell (2003)), years of education, a gender variable, province dummies, household size, binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24) and a measure of the local broad unemployment rate (in the magisterial district) is also included in the model, as an indicator of local economic conditions.

4.8 Social Networks

Some of the usual variables used to predict employment probability, may fall away as important predictors of successful search, given the high unemployment conditions in South Africa. Whether one lives in a pension eligible house, or is part of any informal social networks may be more important in determining employment probabilities, than education level, or whether one searches for work. Two common social networks among the rural poor in South African are burial societies and stokvels⁵¹. The paper extends the basic labour supply model by including measures of membership of such networks.

Stokvel's or ROSCA's are used as informal savings groups, and enable their members to save without pressure from other household members⁵². Keswell and Poswell (2003) document two types of ROSCA's found in Kwazulu Natal; food and money stokvels. Members contribute a regular amount into the common pot, which may be kept in a bank account. After some fixed period the total contributions are shared out among members (Besley et al., 1993). These groups require an amount of social capital, in order to reduce the risk of default⁵³. Potential members are usually stringently examined (Keswell and Poswell, 2003).

ROSCA's mediate lack of access to formal credit markets (Besley et al., 1993), especially for those without collateral, and as such are an important form of consumption smoothing⁵⁴ (Keswell and Poswell, 2003). In such close networks, information regarding potential job opportunities may also be shared. Network membership may mediate the monetary costs of search, and give the added benefit of free information about employment opportunities. Montgomery (1991) refers to the importance of informal hiring channels in matching job seekers with potential employers⁵⁵. Network search is a low cost form of job search compared to other methods (Montgomery, 1991). Given the high poverty levels in rural households, this form of search may be preferred, thus in part explaining the high broad unemployment rate⁵⁶. A ROSCA is a concrete manifestation of a social network which may spread available job information, and finance successful search through credit. For this reason we suspect membership of such a group may affect employment probability.

7.4% of the total population live in households containing a ROSCA member. This percentage is higher for black women, and in rural areas (LFS data, September 2001). Membership is highest in Kwazulu Natal province (13%). Pension income could be used to fund ROSCA membership. The highest levels of membership are found among black female pensioners in rural Kwazulu Natal⁵⁷.

⁵¹In the LFS data of 2001, membership of ROSCA's is not widespread, and there is no data collected on other types of social networks. There are certain questions which relate to how individuals found their jobs, and possible answers include through contacts, but this does not expound on where these contacts are made.

⁵²In Keswell and Poswell (2003), about a quarter of individuals who reported being a ROSCA member had kept this information from their family.

⁵³Members of a ROSCA meet every month in order to make their contributions, and may also engage in other forms of communal activity; this may include working in communal gardens, or helping each other with agricultural tasks (Keswell and Poswell, 2003).

⁵⁴Often these savings are used to fund the purchase of durable goods (Besley et al., 1993). ROSCA's may also make loans to members, during times of financial stress or to fund job search.

⁵⁵In the US about half of all workers found their jobs through friends or relatives (Montgomery, 1991)

⁵⁶Those relying solely on network search will not be classified as active searchers. In the Khayalitsha Mitchell's Plain Survey data, using this description of search to classify network searchers as active job seekers gives a strict unemployment rate of 35.5%, as compared to 28.4% when these network searchers are not included (Natrass, 2002).

⁵⁷21.5% of this group are members.

Large positive effects of network membership on the probability of moving into employment have been found in Keswell and Poswell (2003), Keswell (2000), and Cichello et al. (2002). Presumably this effect would be largest in rural areas, where employment probability is low, and job search costs are high.

4.9 Determinants of the Unemployment to Employment Transition

OLS and Probit estimates of equation (6) are presented in Table 7. The sample used once again consists of African prime age individuals who live in three-generation households. Column 3 represents the probit results where household pension income is instrumented for, using the number of pension eligible men and women in the household.

Women have a 5 to 6 percent lower probability of moving into employment than men. An increase in the broad magisterial unemployment rate of 1 percent is associated with approximately 16 percent lower probability of moving into employment. An extra person in the household is associated with a fall in the likelihood of finding employment of approximately 1 percent. Those individuals who actively search for work have a 5 percent higher chance of moving into employment. All these effects are significant at the 1 or 5 percent level. The returns to education (in terms of gaining employment) are very small and negative. The probability of moving into employment decreases until about 11 years of education (just short of matric), and then increases. At the mean level of education (8.13 years), the return to an extra year of education is negative, but very small⁵⁸. Employment probability increases in age until approximately 47 or 48 years of age, at which point it starts to decline. At the mean (29.5 years of age), the return to an extra year of age is approximately a 1% higher chance of finding employment. The squared age and education terms are not statistically significant in any of the models. The largest single effect on the probability of moving into employment is the local unemployment rate, which reflects local economic conditions. This effect is significant and remarkably consistent across the different models.

In many of the cases, the probit models were a better fit for the data, improving the significance levels of many of the coefficients. Access to pension income is highly significant in both the OLS and Probit models, and an extra R1000 of household pension income is associated with a 7.5% lower probability of finding work. The *network* effects are small and positive, but insignificant. The overall effect on employment probability of combined network membership and access to pension income is slightly positive or zero. These effects are significant at the 5 and 10% levels in the household pension income models (Columns (2a), (2b)), but are not significant in the IV model. In columns (2a) and (2b), an increase in household pension income of a thousand rand is associated with a fall in employment probability of between 8 and 10 percent. However, if the household contains a member of a ROSCA, this effect is nullified by the corresponding raised employment probability of approximately 13 to 14 percent⁵⁹. This is consistent with the results found in Keswell and Poswell (2003), who argues that access to pension income reduces the cost of job search. These results also support those found in the difference-in-differences models, where an increase in the number of eligible households is associated with a positive change in average hours worked per week.

⁵⁸One extra year of education decreases employment probability by **0.2%**.

⁵⁹This effect is also found (and is larger) when these regressions are run with a more general sample consisting of all individuals in the total work force (15-65 years old).

5 Discussion

The average African household has changed in many respects since 1993, and many differences also exist between eligible and ineligible households. Both household size and the percentage of prime age workers in households have fallen, although eligible households are larger on average than ineligible. The average age in eligible households is lower, as is the average level of labour supply compared with ineligible households. Eligible households have slightly lower levels of education than ineligible households, although education levels have increased slightly since 1993. Eligible households are more evenly spread between rural and urban locations compared with those in 1993. Unemployment levels have increased in both types of households. The difference-in-differences results show that on average, when a household becomes eligible this is met with an increase in the labour supply of household members, and slightly decreased household size. These patterns tie in with our hypothesis that pension income is being used to fund both job search (locally and further afield), as well as migration. Migration, and specifically female migration, has increased in the years since the SALDRU data was collected⁶⁰.

The large negative labour supply elasticities found in Bertrand et al. (2003) have reduced in size. The greatest effects on labour supply in table 5 are associated with the oldest pensioners in the household, implying that possibly ill health, rather than the effect of the pension, may be impacting household labour supply. Unfortunately we do not have suitable data in the Labour Force Survey to measure the effect of ill health on labour supply. State pensions may not produce perverse incentives as much as unemployment benefits, as the pension is not lost when household members find work (Klasen and Woolard, 2000). Search activities may not be decreased on pension receipt, and may even be raised due to the availability of resources to fund search. The effect of pensions on the labour market mobility of individuals is mixed, in that job search and migration is possibly funded by pension income, and individuals migrate to pension households to share in these resources. The diminished labour supply effects may also be explained in the light of increased unemployment. Those workers in secure employment may value their jobs very highly. Workers may also not be able to change their weekly work hours without endangering their job security⁶¹.

We hypothesise in section 3 that individuals first decide whether to participate in the labour market, and only then decide how many hours to supply. We find support for this idea in appendix table 1. The employment probability elasticities are correspondingly higher than the labour supply elasticities. The elasticity of employment probability to pension income has also increased since 1993, reflecting in part the higher levels of unemployment in 2001. However our analysis is subject to the same criticism as Bertrand et al. (2003), in that the analysis does not include migrant (and therefore absent) members of the household (Posel and Casale, 2002a). The Labour Force Survey does not collect information on migrant workers. There is clearly a selection problem when we attempt to look at the probabilities that household members find work, given that they have chosen to live in pension eligible households. The effect of pension income on employment probability may change significantly if we include migrant workers in this analysis⁶².

⁶⁰Other trends apparent since 1993 include reduced marriage rates (Posel and Casale, 2002b), and the added worker effect which is correlated with higher female labour force participation.

⁶¹Alderman (1999) cites that high unemployment conditions and the relative poverty of eligible households may imply that disincentive effects in terms of reducing pensioners' labour supply can be disregarded as small effects.

⁶²However, those migrants that are reported as household members may also suffer from selection bias, in that households may report migrants as household members only if they have continued to remit income to the household

We suspect that women have less bargaining power in the household. Thus they are unable to prevent sharing of their own pension income, and may not gain access to the pension income of other household members (Duflo, 2003). The stronger bargaining power of males allows them to seize a greater share of available resources, and thus to afford more leisure. In line with these hypotheses, we find a negligible effect of pension income on female labour supply, and that the presence of female pensioners has a larger effect on household labour supply than that of men. Similar effects are also seen in Bertrand et al. (2003), Duflo (2003), and others. Gender is always a significant variable in our estimates, and the size of the gender effect is never small. The labour supply and employment probability elasticities are much larger for men, and this pattern has remained consistent since 1993. This reflects the higher bargaining power of men in households. The female labour supply elasticity has fallen markedly since 1993, and female hours worked are now close to inelastic with respect to changes in pension income⁶³. It is possible that male pensioners share pension resources only with other males Inder and Maitra (2004). Women on the other hand are more likely to share their pension income, especially with girl children in the household (Duflo, 2003).

In section 4.8 we see that the most important factor which affects employment probability is that of local economic conditions. This is an extremely strong effect. Education, and search have a small positive effect on the probability of moving into employment, which are similar in size to the effects seen in the first part of our analysis, and in Bertrand et al. (2003). However these determinants do not compare in magnitude to the effect of local conditions, and the non-linear effect of network membership and pension income. It is through these less conventional channels that individuals may increase their probability of finding employment.

As previously stated, quantifying the effects of ill health on household labour supply would be a useful extension to this analysis. What is needed is a national survey of labour market outcomes including better data on health status of survey respondents, and network membership. Our analysis looks only at ROSCA membership, which is fairly limited in scale. Burial societies are far more common in South Africa, and we might expect to see even stronger network effects on employment probability if we had better data on burial societies and other social networks. It would also be useful to investigate the channel through which social networks help to improve employment probability when funded by pension income.

Another possible addition would be to measure the effects of pension income on the number of migrants in the household, following Posel et al. (2004). This would help us to discover to what extent pension income is being used to fund job search. Following Inder and Maitra (2004), it may also be beneficial to measure the effects of the exact number of pension eligible people in the household, rather than merely reflecting the absence or presence of pension eligible household members. Two households may both be classified as eligible, but may have very different levels of pension income available.

6 Conclusion

Many households, especially those in rural areas in South Africa, are under great economic pressure. Relying mainly on one income source only (Dieden, 2003), three-generation households act as safety

(Posel and Casale, 2002a).

⁶³If the woman in question has obtained a matric certificate, pension income will have very little effect on her labour supply.

nets for those who are unemployed, and for the children of migrant workers. In the future, these households may also care for the expected high numbers of AIDS orphans and AIDS sick. The lack of strong job growth since 1994, and the fact that the labour force has grown faster than the jobs available has resulted in high unemployment rates. Without any unemployment insurance, or any large public works programs, these individuals are forced to rely on pension income. Members in rural households may also have a very low chance of finding employment.

In 1993, Bertrand et al. (2003) found a strongly negative labour supply elasticity to the presence of pension income in the household. We find that labour supply elasticities have fallen in size since 1993, and employment elasticities have increased. However given the current data collection methods in most national surveys, we will continue to get a skewed picture of the effects of state transfers, until better information is collected on migration, and the effect of pension payments on migrants (Pose! and Casale, 2002a). Pose! et al. (2004) demonstrate an accurate portrait of labour supply effects once migrants had been taken into account. The employment results presented in section 4 are thus only a reflection of the employment status of the members of the household actually present in the household. Men and women who are absent and working elsewhere are not counted in the analysis, despite the fact that they may still retain full ties with the household. To say these migrants are not actually household members is misleading.

One of the effects of pension payments on households may be the increase of female bargaining power in the household. Women use state transfers to improve the nutritional status of girl children (Duflo, 2003), and to fund the job search costs of prime age women (Pose! and Casale, 2002a). When prime age women move to eligible households, they gain two benefits. They may avail themselves of free childcare, and might also find the financial resources needed to become a migrant worker. South Africa has a patriarchal tradition, and at the current time has the highest rate of femicide in the world. Pension income may help women gain the financial power to form their own households. Pose! and Casale (2002b) find a decrease in marital rates among African women who live in rural areas, and falling numbers of women who live with men (and especially with employed men), from 1993 to 1999. We find strong gender effects in our analysis, most marked the fact that female labour supply is close to inelastic to changes in household pension income, especially if the female household member has gained her matric certificate.

While state transfers may affect employment probability, this effect is negated somewhat when we take into account the non-linear effect of pensions and social network membership. Better information needs to be collected on social network membership, as this has a strong positive effect on employment probability, comparable in size only to the effect of local conditions. The traditional determinants of employment probability are less important, given the high unemployment environment in South Africa. Possible extensions to this paper include quantifying the effect of different amounts of pension income present in the household, and examining the effect of the health status of household members on household labour supply.

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Tables

Table 1: Descriptive Statistics

	Africans
Eligible for Pension %	6.4
Live in HH with someone eligible %	29
Live in 3 Generation HH %	85
Pension Takeup (of those Eligible)%	85
Access to Household Pension Income%	56
Pension Takeup (of those Eligible) - Rural %	87
Access to Pension- Rural Areas %	62
Pension Takeup (of those Eligible)- Urban Areas%	83
Access to Pension- Urban Areas%	62
Pension Takeup (of those Eligible)- Women%	87
Pension Takeup- Men%	81
Illegal Pension Takeup - Women %	0.35
Illegal Pension Takeup - Men %	0.38

Table 1 above presents descriptive statistics relating to pension receipt for Africans, from the age of 15 upwards. Eligibility for a pension refers to age eligibility. Men are eligible for a pension once they reach 65 years of age, while women receive the pension at 60. Very high percentages of African eligible elderly take up the pension (85%), while other race groups mostly rely on private pension schemes (Most race groups other than Africans would not pass the means test for the state pension). 53% of Africans in 2001 report having access to pension income in their household (this may be through their own pension income, or someone else in the household receiving a pension, or through pension income being sent to the household as remittance income) despite the fact that only 6.4% report eligibility for a pension. This is explained by the much larger size of eligible households. The pension scheme is characterised by almost total saturation, with very **high percentages of actual takeup, unlike other grants such as the maintenance grant scheme**, which is still growing to full delivery (Alderman, 1999). Source: Labour Force Survey, September 2001. Author's own calculations.

Table 2 Descriptive Statistics relating to Eligible and Ineligible Households

Variable	All Households		Eligible Households		Ineligible Households	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Age	29.5	9.9	27.9	9.2	30.1	10.1
Employed	0.311	0.463	0.169	0.374	0.365	0.481
Hours Worked	27.53	26.79	17.84	25.05	30.34	26.62
Unemployed	0.209	0.407	0.253	0.435	0.192	0.394
Discouraged	0.065	0.247	0.072	0.258	0.063	0.242
4th grade or more	0.885	0.319	0.890	0.312	0.883	0.321
8th grade or more	0.646	0.478	0.655	0.475	0.643	0.479
Matric or more	0.221	0.415	0.214	0.410	0.223	0.416
Household Size	5.81	3.38	7.64	3.83	5.14	2.92
Rural	0.508	0.500	0.580	0.494	0.482	0.500
Total Income	1930	2663	1849	2276	1949	2744
Pension Income	233	409	662	460	53	197
No of Eligible Women	0.230	0.442	0.866	0.429	0	0
No of Eligible Men	0.088	0.286	0.330	0.478	0	0

In table 2 above, we present descriptive statistics for household members of eligible and ineligible households (AU Households), Eligible Households (those that contain at least one pension eligible person, i.e. one man over the age of 64 or one woman over the age of 59), and Ineligible Households (Those with no pension eligible members). The sample used contains African individuals, who are of prime working age (between 16 and 50 years of age), and who live in three-generation households. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Table 3: Investigating the effects of Pensions on Labour Supply and Employment Probability.

Variables	Hours	Worked		Emp	Status	
	OLS	OLS	IV	OLS	OLS	IV
	Pension Uptake	Pension Eligibility		Pension Uptake	Pension Eligibility	
	(1;	M	(3)	(4)	(5)	(6)
Pension Income x 1000	-6.635 (0.652)	-	-8.512 (0.780)	-0.136 (0.013)	-	-0.173 (0.015)
Household Eligibility	-	-7.702 (0.560)	-	-	-0.156 (0.011)	-
Female	-5.610 (0.446)	-4.393 (0.404)	-5.648 (0.412)	-0.079 (0.008)	-0.053 (0.007)	-0.079 (0.008)
Age	-20.052 (4.952)	-22.356 (4.511)	-20.316 (5.065)	-0.523 (0.096)	-0.679 (0.090)	-0.528 (0.094)
Age ²	0.975 (0.235)	1.126 (0.212)	0.989 (0.240)	0.025 (0.005)	0.033 (0.004)	0.025 (0.004)
Age ³	-0.019 (0.005)	-0.023 (0.004)	-0.019 (0.005)	-0.000 (0.000)	-0.001 (0.000)	-0.000 (0.000)
Age ⁴ x 1000	0.132 (0.036)	0.164 (0.032)	0.134 (0.036)	0.003 (0.001)	0.004 (0.001)	0.003 (0.001)
Matric or more	2.475 (0.474)	1.586 (0.445)	2.475 (0.465)	0.070 (0.009)	0.052 (0.008)	0.070 (0.009)
R2	0.12	0.14	0.12	0.15	0.17	0.15
No Obs	14484	18307	14484	14491	18318	14491

In table 3 above, we investigate the effect of pension income and household eligibility on labour supply and employment probability. Labour supply is measured as hours worked per week, and employment probability is equal to 1 if the person is employed, and 0 if unemployed. We make use of Ordinary Least Squares estimates. In columns 3 and 6 we instrument for endogenous household pension income using the number of eligible men and women present in the household as instruments. The coefficient on household pension income has been multiplied by a factor of 1000, hence the coefficient in column one of -6.635 implies that an increase of household pension income of a thousand rand is associated with a fall in individual labour supply of 6.635 hours per week. An increase in household pension income of a R1000 reflects the effect of the addition to the household of between one and two pensioners. The coefficient on the quartic term in age is reported after being multiplied by a 1000, following Bertrand et al. (2003). Standard errors have been corrected for clustering within household groups, and are reported below the regression coefficients in parentheses. The list of explanatory variables also includes a rural indicator, binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24), province dummies where the base category is the Western Cape, and household size. The sample used contains African individuals, who are of prime working age (between 16 and 50 years of age), and who live in three-generation households. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Table 4 O1S models of Labour Supply and Employment Status for Men and Women.

Variables	Hours Worked		Employment Status			
	OLS	O1S	IV	OLS	O1S	IV
	Pension Uptake	Pension Eligibility		Pension Uptake	Pension Eligibility	
	(1)	(2)	(3)	(4)	(5)	(6)
Men						
Pension Income x 1000	-9.730 (0.916)	-	-12.525 (1.131)	-0.186 (0.017)	-	-0.230 (0.021)
Household Eligibility	-	-10.198 (0.798)	-	-	-0.186 (0.015)	-
Matric or more	1.856 (0.705)	1.273 (0.636)	1.847 (0.696)	0.058 (0.013)	0.046 (0.011)	0.057 (0.013)
R2	0.11	0.14	0.11	0.13	0.16	0.12
No Obs	7157	9096	7157	7164	9108	7164
Women						
Pension Income x 1000	-3.542 (0.788)	-	-4.208 (1.067)	-0.084 (0.017)	-	-0.109 (0.020)
Household Eligibility	-	-5.141 (0.686)	-	-	-0.123 (0.014)	-
Matric or more	3.043 (0.600)	1.767 (0.578)	3.045 (0.617)	0.083 (0.012)	0.058 (0.011)	0.083 (0.012)
R2	0.13	0.13	0.13	0.19	0.18	0.19
No Obs	7327	9211	7327	7327	9210	7327

In table 4 above, we investigate the effect of pension income and household eligibility on labour supply and employment probability. Labour supply is measured as hours worked per week, and employment probability is equal to 1 if the person is employed, and 0 if unemployed. We make use of Ordinary Least Squares estimates. These estimates are calculated separately for both men and women. In columns 3 and 6 we instrument for endogenous household pension income using the number of eligible men and women present in the household as instruments. The coefficient on household pension income has been multiplied by a factor of 1000. Hence the coefficient in column one for men of -9.730 implies that an increase of household pension income of a thousand rand is associated with a fall in individual male labour supply of 9.730 hours per week. An increase in household pension income of a 1000 reflects the effect of the addition to the household of between one and two pensioners. The coefficient on the quartic term in age is reported after being multiplied by a 1000, following Bertrand et al. (2003). Standard errors have been corrected for clustering within household groups, and are reported below the regression coefficients in parentheses. The list of explanatory variables also includes a rural indicator, binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24), province dummies where the base category is the Western Cape, and household size. The sample used contains African individuals, who are of prime working age (between 16 and 50 years of age), and who live in three-generation households. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Table 5: Labour Supply Models Accounting for the Presence of Elderly Members of the Household

Dependent Variable: Labour Supply								
Explanatory Variables	OLS (1a)	Tobit (1b)	OLS (2a)	Tobit (2b)	OLS (4a)	Tobit (4b)	OLS (6a)	Tobit (6b)
Eligible Elderly in HH	-7.702 (0.560)	-9.548 (0.713)	-	-	-	-	-	-
InEligible Elderly in HH	-0.556 (0.910)	-0.731 (0.948)	-	-	-	-	-	-
Number of Persons in HH 50-55	-	-	-0.347 (0.181)	-0.423 (0.202)	-0.332 (0.182)	-0.408 (0.203)	-	-
Number of Women in HH 50-55	-	-	-	-	-	-	-0.701 (0.259)	-0.836 (0.284)
Number of Men in HH 50-55	-	-	-	-	-	-	0.037 (0.284)	0.005 (0.317)
Number of Persons in HH 55-60	-	-	-0.144 (0.204)	-0.163 (0.233)	-0.123 (0.206)	-0.141 (0.234)	-	-
Number of Women in HH 55-60	-	-	-	-	-	-	-0.407 (0.307)	-0.483 (0.346)
Number of Men in HH 55-60	-	-	-	-	-	-	0.142 (0.336)	0.191 (0.375)
Number of Persons in HH 60-65	-	-	-0.456 (0.214)	-0.506 (0.238)	-0.537 (0.225)	-0.606 (0.250)	-	-
Number of Women in HH 60-65	-	-	-	-	-	-	-0.962 (0.287)	-1.091 (0.325)
Number of Men in HH 60-65	-	-	-	-	-	-	-0.432 (1.282)	-0.604 (1.386)
n6065m X deviation from eligibility rule in region	-	-	-	-	-	-	16.422 (37.300)	21.421 (40.339)
Number of Persons in HH over 65	-	-	-0.840 (0.144)	-0.955 (0.162)	-	-	-	-
Number of Persons in HH 65-70	-	-	-	-	-0.463 (0.254)	-0.530 (0.280)	-	-
Number of Women in HH 65-70	-	-	-	-	-	-	-0.682 (0.335)	-0.817 (0.368)
Number of Men in HH 65-70	-	-	-	-	-	-	-0.087 (0.450)	-0.064 (0.512)
Number of Persons in HH over 70	-	-	-	-	-0.866 (0.185)	-0.982 (0.207)	-	-
Number of Women in HH over 70	-	-	-	-	-	-	-1.185 (0.254)	-1.435 (0.285)
Number of Men in HH over 70	-	-	-	-	-	-	-0.192 (0.337)	-0.072 (0.375)
R^2	0.14	0.04	0.13	0.04	0.13	0.04	0.13	0.04

In table 5 above, we investigate the effect of the presence of the different types of elderly people in the household on individual weekly labour supply. Column 1a, 2a, 3a, and 4a represent OLS results with labour supply as the dependent variable, while column 1b, 2b, 3b, and 4b represent tobit results for labour supply. We report the marginal effects for the tobit estimates. These are partial derivatives of the expected value of labour supply with respect to the right hand side variables. The R^2 value for the tobit models is the Anova Based Fitness Measure as quoted in Limdep. Tobit results have been corrected for heteroscedasticity. Robust standard errors are calculated, and are corrected to allow for cluster effects in households. Standard errors are reported below the coefficients in parentheses. The list of explanatory variables also includes a quartic in age, a gender variable, a binary variable for whether matric has been completed or not, a rural indicator, binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24), 8 province dummies where the base category is the Western Cape, and household size. Sample size for these regressions is 18307. The sample used contains African individuals, who are of prime "forking age (between 16 and 50 years of age), and who live in three-generation households. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Table 6: Difference-in-Differences Estimates of Hours Worked and Household Size.

	Labour Supply		Labour Supply		Household Size	
	All (1) OLS	African (2) OLS	All (3) Tobit	African (4) Tobit	All (5) OLS	African (6) OLS
β_0	33.280 (0.152)	31.714 (0.185)	21.109 (0.198)	16.734 (0.236)	4.780 (0.014)	4.867 (0.017)
Time	0.334 (0.214)	-0.035 (0.261)	0.392 (0.235)	0.046 (0.282)	0.173 (0.027)	0.220 (0.032)
Elig	-12.619 (0.377)	-13.808 (0.442)	-15.740 (0.437)	-17.434 (0.513)	2.621 (0.031)	2.755 (0.036)
β_1 Time . Elig	3.055 (0.525)	2.627 (0.623)	4.360 (0.602)	4.015 (0.714)	-0.580 (0.058)	-0.615 (0.067)
R ² value	0.03	0.03	0.004	0.01	0.10	0.11
No Obs	65547	48486	65547	48486	75588	59051

In table 6 above, we investigate the average effect of household pension income, and household eligibility on individual labour supply and household size. We make use of a difference-in-differences estimator. The sample used in this analysis includes individuals who are between the ages of 16 and 50 in 2001. We analyse two groups: individuals of all races, and specifically Africans. Robust standard errors are calculated, and are reported below the coefficients in parentheses. Results for the employment status probit are marginal effects, evaluated at the means of the continuous variables and as a differential change for binary variables, OLS results are presented for labour supply in column 1 and 2 and tobit results are presented in column 3 and 4. The Time dummy is equal to one in 2002, and to zero in 2001. Elig reflects whether an individual lives with at least one age eligible household member. The Time.El原因 term reflects whether the individual lived in an age eligible household in 2002. The percentage correctly predicted for all households and for African households in the employment models is 49.98 and 50.15% respectively. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Table 7: The effect of Pensions on Employment Probability over Time.

Variable	(1a OLS)	(1b Probit)	(2a OLS)	(2b Probit)	(3 IV)
Age	0.015 (0.007)	0.018 (0.007)	0.015 (0.007)	0.017 (0.007)	0.017 (0.007)
Age ²	-0.0001 (0.000)	-0.0002 (0.000)	-0.0001 (0.000)	-0.0001 (0.000)	-0.0002 (0.0001)
Years Education	-0.018 (0.008)	-0.017 (0.008)	-0.018 (0.008)	-0.018 (0.008)	-0.018 (0.007)
Years Education ²	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.0008 (0.0005)
Access to Pension Income	-0.074 (0.017)	-0.076 (0.017)	-	-	-
Pension Income * 1000	-	-	-0.085 (0.016)	-0.102 (0.022)	-0.090 (0.027)
Female	-0.054 (0.015)	-0.057 (0.015)	-0.054 (0.015)	-0.057 (0.015)	-0.057 (0.015)
ROSCA	0.006 (0.036)	0.007 (0.035)	0.007 (0.033)	0.005 (0.032)	0.015 (0.032)
ROSCA * Access	0.083 (0.059)	0.096 (0.067)	-	-	-
ROSCA * Pension Income * 1000*	-	-	0.127 (0.076)	0.142 (0.073)	0.089 (0.094)
HH Size	-0.007 (0.003)	-0.007 (0.003)	-0.007 (0.003)	-0.007 (0.003)	-0.008 (0.003)
Unemployment Rate in Magisterial District Search	-0.162 (0.076)	-0.162 (0.077)	-0.167 (0.075)	-0.164 (0.077)	-0.165 (0.068)
	0.046 (0.016)	0.048 (0.016)	0.044 (0.016)	0.046 (0.016)	0.046 (0.015)
Age*	50.05	46.60	51.30	47.37	47.76
Educ*	11.30	11.17	10.88	10.68	10.74
Age Return	0.01	0.021	0.006	0.021	0.007
Education Return	-0.004	-0.014	-0.004	-0.013	-0.004
% Correctly Predicted	-	75.6%	-	75.6%	50.3%
R ²	0.04	0.04	0.04	0.05	0.04
No Obs	3535	3535	3538	3538	3538

In table 7 above, we investigate the effect of pension income and eligibility and household ROSCA membership on the individual probability of finding employment. Column 1a and 2a contain the OLS estimation while column 1b and 2b contain the probit results. The probit results are marginal effects, calculated by finding the partial derivatives of the expected value of y with respect to the right hand side variables. For continuous variables we evaluate at the means of the variables, and for categorical variables we evaluate as differential changes between the categories. Robust standard errors are calculated, and are corrected to allow for cluster effects within households. Standard errors are reported in parentheses below the coefficients. Column 3 contains the IV estimation, where we use the number of eligible men and women in the household as IV's for endogenous household pension income. The list of explanatory variables also includes binaries for the number of children in the different age groups present in the household (ages 0-5, 6-15, 16-18, 19-21, 22-24), and province dummies where the base category is the Western Cape. The number of observations for these regressions was 3541. The sample used contains African individuals, who are of prime working age (between 16 and 50 years of age), and who live in three-generation households. Source: Labour Force Survey Data, September 2001. Author's own calculations.

Appendix

A.I

Table 1: Hours Worked and Employment Probability Elasticities in 2001 and 1993.

	Labour Supply	Employment Probability
Elasticities		
All		
1993	-0.53	-0.55
2001	-0.35	-1.03
Male		
1993	-0.66	-0.98
2001	-0.52	-1.37
Female		
1993	-0.43	-0.14
2001	-0.17	-0.65

In appendix table 1 above, we calculate the labour supply and employment probability income elasticities, and compare them to the corresponding 1993 SALDRU figures calculated in Bertrand et al. (2003). Source: (1) Bertrand et al. (2003), SALDRU data, and (2) Labour Force Survey Data, September 2001. Author's own calculations.