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David Lam, Murray Leibbrandt and Vimal Ranchhod

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David Lam (University of Michigan)
Murray Leibbrandt (University of Cape Town)
Vimal Ranchhod (University of Michigan)

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David Lam is Professor, Department of Economics and Senior Research Scientist, Population Studies Center, at the University of Michigan. Murray Leibbrandt is Professor, School of Economics, University of Cape Town. Vimal Ranchhod is Ph.D. candidate, Department of Economics, University of Michigan. Support for this research was provided by the U.S. National Institute on Aging, the Fogarty International Center of the U.S. National Institutes of Health, and the Mellon Foundation.

1. Introduction

The elderly in South Africa face a complex set of challenges. South Africans over age 50 spent most of their lives under apartheid. Levels of inequality in education between races and within races are far greater among these older cohorts than they are for younger South Africans. Elderly black South Africans lived their most productive years under the restrictions on employment, residency, and other opportunities that apartheid imposed. As they now enter retirement they face new pressures caused by the impact that HIV/AIDS and high unemployment rates are having on the next generation. At the same time, South Africa's elderly have access to an old age pension system that is among the most generous in the developing world. The old age pension helps lift many older South Africans out of the most extreme forms of poverty, and puts many of them in a position supporting their children and grandchildren.

Decisions of the elderly about work and retirement are made in this complex set of circumstances. Older workers face an increasingly competitive labor market characterized by high unemployment, with limited opportunities for those with poor education and training. They often live in large extended households in which their own resources may be an important source of economic support. The pension provides an important source of support, without necessarily competing with work.

The state old age pension program has spawned a considerable body of research. This research is reviewed in the next section of the paper. The review shows that state old age pension is the key plank of South Africa's social safety net, that these pensions are well targeted at the poor and, because of the large number of three-generation and skip-generation households in South Africa, this includes many poor children. In addition, it seems that many of the unemployed survive through their links to related pensioners. More recent research has begun to explore the impact of these pensions on labor participation behavior.

Given all of the above, the dearth of research on the elderly themselves is surprising. We know very little about the circumstances of the elderly, the health of the elderly and how they have coped with the pressures placed on them by the importance of their pension income to their extended families. Recent research by Møller and Devey (2003) begins to address these issues by comparing older and younger households based on data from 1995 and 1998 national sample surveys. The study defines older households as households that include at least one member who

is 60 years of age or older. The study confirms that older households are larger and include larger numbers of dependents and unemployed members than younger households. In both 1995 and 1998, approximately half of the older black households sheltered three or more generations. Such households tend to be concentrated in rural areas. These older households tend to be female dominated and are more likely to be female-headed than younger households. Older black households are more likely than younger households to occupy formal houses as homeowners. However, in 1995 they were less likely to have access to piped water, electricity, sanitation and refuse removal. By 1998 this difference had disappeared. Møller and Devey (2003) attribute this to the fact that pension income gave these households the chance to pay for such services. Many of these older black households are poor. However, access to state old age pensions strongly decreases the probability that such households fall into the lowest expenditure quintile. These pensioner households have better access to services and express significantly higher levels of satisfaction with their living conditions compared to non-pensioner older households.

Aside from work on the old age pension, the magnitude of South Africa's unemployment problem has spawned a growing body of work on labor force participation in South Africa. This work shows that South African participation rates are low by international standards; especially for women (Winter, 1998). However, participation rates, and female participation rates in particular, rose sharply in the 1990s despite the fact that many of these new participants did not move into employment but joined the ranks of the unemployed (Casale and Posel, 2002 and Klasen and Woolard, 2000). Research by Mlatsheni and Leibbrandt () and Leibbrandt and Bhorat (2001) look at the determinants of participation and highlight the importance of education as a factor affecting female participation rates.

However, this literature on participation has given very little specific attention to the labor market behavior of the elderly. Given that there has been as active exploration of the impact of the old age pension program on labor participation, it is rather anomalous that the labor participation behavior of those who actually receive these pensions or who are married to people who receive these pensions has received so little attention. The fact that it is the elderly who are confronting a retirement decision as part of this participation behavior would seem to make their labor participation behavior especially interesting.

This paper provides a broad overview of the labor force activity of older workers in South Africa. We begin the paper with a discussion of important features of the social and economic environment that provide a background for the analysis. Drawing on excellent microdata, we then analyze the age profile of participation, focusing in particular on the possible effects of the old age pension on retirement. We look at several important variables that may affect the economic activity of the elderly, including marital status, living arrangements, the pension system, education, and geography. We estimate probit regressions in order to look at key determinants of labor force activity.

2. Social and Economic Background

A number of features of South African society and economy are important to keep in mind in analyzing the economic activity of the elderly. In this section of the paper we discuss some of these important features, with particular focus on the old age pension system and patterns of household structure.

South Africa's Old Age Pension

No analysis of the elderly in South Africa would be complete without a discussion of the country's old age pensions system. Social assistance in South Africa consists of three main programs: pensions for the elderly, grants for the disabled and grants for the support of poor children. Old age and disability pensions are currently set at generous levels (R640 or about $75 per month from November 2002), but child support grants are meager (at R140 or about $18 per month) and are only payable for children up to and including the age of six. All three are supposedly means-tested, but in practice the means test is rarely administered for applicants who appear poor. A total of between four and five million people (or 10% of the total population) receive one or other grant. South Africa's public welfare system is exceptional among developing countries, and is a major pillar in South Africa's highly redistributive social policies (Van der Berg, 2001; Van der Berg and Bredenkamp, 2002; Seekings, 2002).

The state old age pension system is the most unique and important aspect of the system. Case and Deaton (1998) provide a comprehensive analysis of the South African pension system. The key features of the system are that it is paid to women age 60 and over and men age 65 and over, with a means test that causes 80% of age-eligible Africans to receive the pension. Most receive the maximum benefit, which was more than twice the median per capita household

income of Africans in 1993. The provision of such a extensive pension benefits is essentially the result of the dismantling of apartheid, with a program that was originally designed for a small percentage of poor whites having been extended to the much poorer African population.

Household Structure

Another important dimension of South African society that is important in analyzing the economic activity of the elderly is the complex extended household structure that is common among African households. As noted by Case and Deaton (1998), one of the reasons the pension system is so effective in reducing poverty in South Africa is that the elderly recipients of the pension often live in households with young children. While these complex extended household patterns have long historical roots in South Africa, they have taken on new importance as HIV/AIDS and high unemployment have weakened the ability of prime age adults to support their families. The labor supply decisions of the elderly are therefore often being made simultaneously with decisions about living arrangements. We will look at the links between household structure and the labor force activity of the elderly in some detail. While it is impossible to identify the causal links between household structure and the work activity of the elderly, we will see below that there appear to be important links between these variables.

3. Data

We use two main data sets for our analysis, each with strengths and weaknesses. We use the 10% sample of the 1996 census for many of our estimates, taking advantage of the large sample size. With over 4 million total observations, the census gives us thousands of observations at single years of age, even at ages from 60 to 70. For example, the number of individuals in the 70-74 age group in the census sample is over 11,200 African males, 17,200 African females, 4,500 white males, and 5,800 white females. The census provides standard information on employment status, along with information on schooling, household structure, and marital status.

The other important data set used in our analysis is the South Africa Labour Force Survey (LFS), a nationally representative household survey of about 30,000 households collected by Statistics South Africa. We use the September 2000 LFS for some of our analysis because it has greater detail than the census for variables such as work activity and pension receipt. The drawback of the LFS is the smaller sample size. For example, in the 50-79 age group we have roughly 4,000 African males and 6,000 African females, making it difficult to look at fine age

detail and making it almost impossible to look at any population group other than Africans. For certain parts our analysis we pool the LFS data for September 2000 and September 2001, giving us a larger sample size. Although the LFS is designed with a rotating panel structure, a new sample was introduced in September 2001, so there is no overlap in these two waves. We also merge the September LFS with the 2000 Income and Expenditure Survey (IES), allowing us to look at the impact of pension income on total household income.

4. Age Profiles of Labor Force Participation

Figure 1 shows the age profile of labor force participation in South Africa for males and females in each of South Africa's four main population groups – African (black), coloured, Indian, and white. We use 1996 census data for this analysis since the large sample size allows us to estimate participation rates for single years of age for each population group with reasonable precision. The measure of labor force participation used in Figure 1 follows standard international definitions, counting labor force participants as those who were either working, on vacation/sick leave from work, or looking for work. South Africa's high unemployment rates cause there to be substantial differences between the percentage working and the percentage in the labor force at most ages. We will analyze this issue in detail below, but we begin with analysis of participation rates in order to allow us to make comparisons to international literature on retirement. An important caveat for all of our analysis is that the age profiles we are analyzing include both cohort and age effects. While we will often interpret the patterns as indicating changes in employment activity over the life cycle, some of the age patterns we observe may be affected by differences in the behavior of different cohorts. For example, as we will document below, younger cohorts are considerably better educated than older cohorts, especially among Africans. This may lead to differences in life cycle labor force behavior that will show up in the age profile of participation at any given point in time.

Figure 1 shows a relatively rapid rate of withdrawal from the labor force for both men and women after age 50. Male participation rates fall from around 80% at age 50 to 50% at age 60 and 10% at age 70. There are relatively small racial differences in participation rates for males at all ages. Participation rates are somewhat lower for African and Coloured males from age 45 to 55, with similar rates of decline in participation for all groups from age 55 to 65. Participation rates for women are considerably lower at all ages, falling from around 60% at age 45 to 20% at

age 60 and under 5% at age 70. Racial differences in participation rates are larger for females than for males, with Indian women having the lowest rates. Participation rates for African and white women are almost identical up to age 59, with participation of African women showing a larger drop in participation at age 60. Participation rates above age 65 are between 10% and 20% for men, rates that are much lower than the 65% participation rate reported for southern Africa in Clark and Anker's cross-national analysis of 1980 data. Participation rates of older men in South Africa are somewhat higher than those for most European countries, however. As shown in the cross-national study of retirement in OECD countries coordinated by the National Bureau of Economic Research, participation rates for men aged 60-64 were below 20% in France, Belgium, and the Netherlands around 1995 (Gruber and Wise, 1999). We will discuss comparisons to OECD countries in more detail below.

Components of Labor Force Activity

Figure 2 shows the distribution of labor force activity in more detail. Four categories of activity are shown. The two components of labor force participation –working and unemployed – are shown separately. Work is defined broadly in the census, including any work for pay, profit, or family gain.[1] Also shown is the percentage reported as being a "pensioner/retired person" and the percentage reported as being disabled. Additional possible responses for labor force activity in the 1996 census that are not included in the breakdown in Figure 2 include student, housewife/homemaker, and "not wishing to work." One of the most striking results in Figure 2 is the high rate of unemployment for African men and women, even in what would usually be considered prime working years. Over 20% of both African men and African women age 45-50 reported that they were unemployed and looking for work in 1996. These high rates of unemployed have if anything increased since 1996, and are an important characteristic of the South African labor market that must be kept in mind throughout our analysis.

The percentage of African men and women who are unemployed declines steadily with age, with many of these men presumably reclassifying themselves as retired as they get older. The percentage who are reported as retired climbs steeply after age 65, reaching about 80% by age

[1] The wording on the census questionnaire is the following: "Does (the person) work (for pay, profit, or family gain)? Answer yes for formal work for a salary or wage. Also answer yes for informal work such as making things for sale or selling things or rendering a service. Also answer yes for work on a farm or the land, whether for a wage or as part of the household's farming activities. Otherwise answer no."

70. The percentage of men and women of either racial group reported as disabled is relatively low, never reaching as high as 5%. It is interesting to compare this to the significantly higher rates of disability reported for many OECD countries in the NBER study (Gruber and Wise, 1999). For example, in the Netherlands, a country with generous disability insurance, well over 20% of men aged 60-64 were reported as being disabled in 1994 (Kapteyn and de Vos, 1999).

The proportion of African men working stays close to 60% until around age 53, then falls steadily until age 65. There is a somewhat more rapid drop around age 65, the age of pension eligibility, with a leveling off at around 10% around age 70. Higher percentages of white men work at all ages, with a difference at age 59 of about 10 percentage points. The percentage of white men working shows a sharp drop from age 59 to 60, perhaps the result of mandatory retirement. African women have the lowest employment rates at all ages. The percentage of African women working is under 40% at age 45, falls to around 20% at age 59, then drops sharply to about 10% by age 61. The sharp drop between and 59 and 61 is presumably related to women reaching the age of pension eligibility. White women also show a substantial drop in employment rates between age 59 and 60, however, even though white women are much less likely to receive the state old age pension.

Further detail on the economic activity of older workers is provided in the Labour Force Survey, which asks a series of separate questions about specific types of economic activity. In addition to providing greater detail than the census, these questions may elicit higher levels of economic activity than the single question used in the census. Table 1 shows detailed breakdowns of work activity for African males and females in five-year age groups using the merged September 2000 and September 2001 LFS. Due to small cell sizes we do not attempt this breakdown for other population groups. Column 2 shows the percentage engaged in work for pay, excluding domestic workers. About 54% of men are in this category in the merged 2000-2001 LFS data. This percentage drops to 41% by age 55-59, then drops sharply to 26% in the 60-64 age group and 11% in the 65-69 age group. Column 3 shows the percentage employed as domestic workers, an occupation that is, not surprisingly, concentrated among women. Combining the first two columns for women, about 37% are engaged in work for pay at age 45-49. There is a sharp drop from 29% to under 10% between the 55-59 and 60-64 age groups.

Column 5 in Table 1 shows the percentage who report that they work on a family plot or farm.[2] This is an activity that is counted in as economically active in many surveys, including the LFS and census. While less than 4% of men report that they are working on a family plot in the 45-49 age group, this rises to about 10% among 65-69 year-olds and remains at roughly that level through the 75-79 age group. Column 7 in Table 1 shows the percentage working for any of the definitions given in Columns 2 through 6. Although the categories in Columns 2-6 are not mutually exclusive, the total percentage working in Column 7 is calculated to eliminate double counting. Comparing the estimates of percentage working from the LFS in Table 1 with the estimates from the census in Figure 2, it appears that the specific questions about work on family plot in the LFS lead to higher estimates of work activity for older workers than the census, even though the census question should theoretically include the same components as those included in Table 1. For example, the total percentage of men working in the 65-69 age group is 25% in the LFS figures in Table 1, while the percentage is well under 20% for the census in Figure 2. While the percentage of elderly working could have increased between 1996 and 2000, we suspect that the difference is the result of higher response to the specific question directed at work on a family plot in the LFS.

Hazard Rates for Withdrawal from Labor Force

A useful way of focusing on withdrawal from the labor force is to calculate hazard rates for exit from the labor force. Figure 3 shows hazard rates of leaving employment for African and white males and females. These are calculated using the proportions working at each age shown in Figure 2. The hazard rate is the percentage decline in the proportion working between age x and age $x+1$. It can be thought of as an estimate of the probability of retirement at a given age, given that a person was working the previous year, although it is important to keep in mind that it is being estimated from the age profile of employment at a given point in time, and therefore does not show the actual retirement experience of individuals.

The top panel of Figure 3 shows the hazard rate of retirement for African males and females. For men these hazard rates are below 5% at every age until age 58. The hazard rate for men rises slightly around age 60, reaching about 10% at age 59, 60, and 61. For African women the hazard

[2] Specifically, the LFS asks whether in the past seven days a person "did any work on his/her own or the family's plot, garden, cattle post or kraal or help in growing produce or in looking after animals for the household."

rate has a very sharp peak of over 30% at age 60, the age at which women become eligible for the old age pension. The hazard rate for women remains at over 20% at age 61 and 62, drops below 10% at age 62, then begins rising again to a second peak of around 25% at age 66 and 67. For African men the major peak in the hazard rate of leaving employment is around ages 65-67, with a peak hazard rate of about 25% at age 66. While the peak in the hazard rate for men around age 65 is roughly consistent with the age 65 age of eligibility for the old age pension, this peak is not as sharp or as large as the peak for women at age 60. It is also striking that the hazard rate for women around age 65 is almost identical to the hazard rate for men, in spite of the fact that 65 might be expected to be a much more significant retirement age for men.

The bottom panel of Figure 3 shows the hazard rates for leaving employment for white males and females. The hazard rate is fairly low up to age 55, rises slightly in the 55-59 age group, then exhibits a spike of about 22% for women and 16% for men at age 60. The increase at age 60 for women might be partly influenced by the old age pension, since some white women do receive the public pension. The peak at age 60 for both white men and white women may also be driven in part by mandatory retirement policies that exist for many public and private employers. A second peak for both white men and white women is observed at age 65, reaching about 25%. This may also be related to employer retirement ages or incentives in private pension systems.

Comparative Estimates of Unused Productive Capacity

A useful summary measure of the labor force participation rates of older works is the measure of unused productive capacity used in NBER's cross-national comparative study of OECD countries (Gruber and Wise, 1999). Figure 4 plots this measure for 11 OECD countries included in the NBER study, along with two measures for South Africa. This measure is calculated by summing the proportions out of the labor force between age 55 and 65 and dividing by 11. The measure of 60 for France in Figure 4, for example, can be interpreted as meaning that a cohort experiencing the participation rates for France would only work 40% of the potential number of person-years available for work between age 55 and 65. As emphasized in the Gruber and Wise volume, this measure of unused capacity varies substantially across OECD countries, from a low of 22% in Japan to a high of 67% in Belgium. A major focus of the NBER project is to document a strong positive relationship between this measure of unused capacity and a measure of the implicit tax on working built into each country's pension system.

Two measures of participation for South Africa are used to compare to the OECD countries. The narrow measure of participation is a standard measure that should be comparable to that used in the OECD countries. It corresponds to the measure used in Figure 1, counting labor force participants as those who report that they are employed or unemployed and looking for work. The broader measure of participation also includes those who report that they would be willing to work, even though they are not actively looking for work. Using either of these measures, South Africa compares favorably to Canada and the United States, two countries on the lower end of unused capacity in the NBER study.

A second simple measure of labor force withdrawal shown in Figure 4 is the percentage of men who are out of the labor force at age 59. This measure gives a fairly similar picture to that of the unused labor capacity measure. South Africa is once again between Canada and the United States, with less than 40% of men having withdrawn from the labor force by age 59 by either the broad or narrow measures of participation.

One of the striking results in the NBER study of OECD countries is the very high hazard rates of labor force exit at particular ages that are observed in many countries. These high hazard rates are typically observed at ages associated with strong incentives to retire due to features of the social security system in each country. For example, Gruber and Wise show hazard rates of over 60% at age 60 in France, and hazard rates of almost 70% at age 65 in Spain and the United Kingdom. It is interesting to note that no sharp spikes of this magnitude at single years of age are observed in South Africa.

5. Determinants of Elderly Labor Supply

We now look at some of the important variables that are likely to be related to the economic activity of the elderly. These include household structure, marital status, public and private pensions, education, and residential location. After discussing these variables in isolation, we will estimate probit regressions to estimate the relationship between these variables and work activity of the elderly. It is important to keep in mind that a number of these variables may be endogenous outcomes of joint decisions about living arrangements and residential location. The point of our analysis is not necessarily to identify causal determinants of elderly labor supply, but to identify the important patterns that are associated with the economic activity of elderly South Africans.

Household Structure and Marital Status

One of the important differences between the elderly in South African and the elderly living in the United States or Europe is that the South African elderly are often living in large extended households. Table 2 presents details on household living arrangements and marital status for African and white males and females in five-year age groups, using data from the 1996 census. The table documents large differences in living arrangements for Africans and whites. African women age 60-64, for example, live in households with 5.9 household members, compared to 2.6 household members for white women the same age. Especially striking is the number of children living with elderly Africans. African women age 60-64 have an average of 2.5 co-resident household members under age 18. This compares to an average of 0.2 0-18 year-olds living with white women age 60-64. This tendency to live in extended households is further demonstrated in the proportions living alone or with only a spouse. For African women the percentage living alone stays at around 5% for women in all age groups from age 30-34 to 70-74. White women, by contrast, show the kinds of large increases in the probability of living alone that are observed in the United States. The percentage of white women living alone stays around 5% or less until age 50-54, then rises steadily with age, reaching over 30% for the 70-74 age group. African males are more likely to live alone than either African women or white males in younger age groups, but this percentage declines with age.

The last three columns of Table 2 show the distribution of marital status. Marriage is defined broadly, including any kind of formal or informal cohabiting partnership. African men and women are less likely to be married than whites at young ages, although proportions married for African women and white women converge at around 45% in the 70-74 age group. The combined effect of higher male mortality and the age gap between husbands and wives is evident in the proportions married and widowed at older ages. Men of both races who are still alive in the older age groups are very likely to be married. Only about 11% of African men and 10% of white men age 70-74 are widowed, while 42% of African women and 46% of white women age 70-74 are widowed.

Looking at age groups around the age when many men and women leave the labor market, Table 2 indicates that the great majority of men still have living partners at these ages. About 80% of African men and 85% of white men are still married in the 60-64 and 60-65 age groups. The situation for women is considerably different. Only 54% of African women are married at

age 60-64, with 30% being widowed and 4% divorced or separated (the remainder reported in the census that they were never married). About 66% of white women are married at age 60-64, with 23% widowed and 7% divorced or separated.

Public and Private Pensions

As noted above, South Africa's public old age pension program plays an important role in the lives of elderly South Africans. Figure 5 shows the percentage of African and white males and females who report that they were receiving the pension in the September 2000 Labour Force Survey. The top panel shows the high prevalence of the pension among elderly Africans, with over 80% of males and females age 70 and above receiving the pension. The age eligibility rules appear to be fairly strictly enforced for women, with sharp increases in the percentage receiving the pension at ages 60 and 61. Something over 5% of women in the 55-59 age group report receiving the pension, in spite of not having reached the official age of eligibility of 60. Possible explanations for these anomalies, as noted by Case and Deaton (1998), are age misreporting in the census or exercise of some local discretion in eligibility criteria. The percentage of women receiving the pension increases to 40% at age 60 and 70% at age 61, then continues to rise to about 90% from age 66 and higher. An even larger discrepancy between the technical age eligibility rules and the report of pension receipt is observed for African males. About 15% of men are reported as receiving the pension between the ages of 60 and 64, in spite of not having reached the official age of eligibility of 65. The proportion of men receiving the pension jumps to 50% at age 65, then continues rising until it reaches a peak of 90% at age 75.

The bottom panel of Figure 5 shows the percentage of whites receiving the state old-age pension. These percentages are much smaller than those for Africans, although they are not inconsequential. Small cell sizes make these estimates at single years of age for whites somewhat erratic, but about 30% of women and 25% of men report receiving the pension above age 64.

Figure 6 demonstrates the importance of pensions in the economic situation of African households. The figure shows the proportion of total household income that is attributable to the old age pension for individuals at every age from 50 to 80. The pension income of all household members is included in the calculation, not just the pension income of the individual. The figure shows that pension income accounts for more than 50% of household income for both men and

women beginning around age 70. There is a sharp increase for women beginning at age 60, the age at which those women themselves begin to receive the pension. Similarly, there is a sharp increase in the proportion of household income attributable to pension income for men beginning at age 65, the age at which the men begin to receive pension income. Recalling from Figure 5 that at least 10% of African men and women do not receive the pension, the levels in Figure 6 suggest that pension income accounts for an even higher fraction of household income in those households that do receive the pension.

Figure 7 shows the percentage of African and white males and females receiving employer-provided pensions. The top panel shows that employer-provided pensions are very uncommon for Africans, with fewer than 10% of men and 5% of women receiving them at most ages. The bottom panel shows that private pensions are much more important for whites. The percentage of white men receiving private pensions rises from around 10% at age 54 to well over 50% above age 64. The percentage of women receiving private pensions (presumably in the form of spouse benefits in many cases) is also high, reaching levels of around 40% above age 65. The most pronounced age spike in receipt of private pensions for white men occurs at age 64, where there is an increase from about 20% to 50% receiving pensions.

One of the important features of the South African old age pension system is that receiving the pension is not necessarily incompatible with working. This is true both because the means test does not preclude work and because the rules of the system may be somewhat flexibly applied. Table 3 analyzes the extent to which individuals work and receive the pension at the same time, as reported in the September 2000 LFS. Two definitions of work are used in this analysis. One is a broad definition that includes the family plot category corresponding to Column 5 in Table 1. The second is a narrower definition that excludes those working only on a family plot. Looking at males age 65-69, a group in which all men have reached pension age, Table 3 indicates that the employment rate among men who are not receiving the pension is 47% by the broad definition and 41% by the narrower definition. The employment rate among 65-69 year-old men who *are* receiving the pension is considerably lower, 22% by the broad measure and 7% by the narrow measure. At older ages almost 20% of men receiving pensions are reported as working by the broad measure, but these men are almost all working only on a family plot. A similar result is observed for women. Although 21% of women receiving the pension in the 60-64 age group are working by the broad definition, only 7% are working by the narrow

definition. These results suggest that while we do observe individuals working and receiving the pension at the same time, employment rates are generally much lower among pension recipients than among non-recipients. Using a narrow measure of employment we estimate employment rates of less than 10% for pension recipients.

Schooling

Schooling is an important determinant of employment at all ages, affecting both labor demand and labor supply. In many countries it is observed that better educated workers have later ages of retirement (Peracchi and Welch, 1994). There is a strong effect of schooling on both wages and the probability of employment for prime age workers in South Africa (Anderson, Case, and Lam, 2001; Mwabu and Schultz, 1996). It is therefore natural to look at the impact of schooling on the work activity of the elderly.

Table 4 shows summary statistics for the distribution of schooling for African males and females by five-year age groups. As the table clearly shows, levels of schooling among the elderly in South Africa are very low. More than 50% of males and females over age 60 in the 1996 census had zero years of schooling. The percentage completing seventh grade is under 30% for those 60 and older, and the percentage completing secondary school is below 5% for all age groups age 55 and older. Although males have more schooling than females in older age groups, the gender gap is relatively small compared to many African countries, and narrows substantially at younger ages. As shown by Anderson, Case, and Lam (2001), a female advantage in schooling has clearly emerged among younger cohorts. Table 4 shows the substantial improvements in schooling that have taken place in South Africa over time. Mean years of schooling more than doubles from the 60-64 age group to the 30-34 age group, with the percentage completing secondary school rising from 2.3% for women and 3.9% for men in the older group to 18.7% for women and 21.6% for men in the younger group.

Figure 8 shows the age profile of employment for African males and females, dividing the sample into those with less than seven years of schooling and those with at least seven years of schooling. The better educated group has higher rates of employment at all ages for both men and women. Less educated men begin to withdraw from employment at a faster rate in their late 50s, dropping to employment rates below 30% by age 60. The gap in employment between the schooling groups is much larger for African women, where there is more than a 20 percentage

point difference in employment rates between the education groups at ages up to age 60. The better educated women appear to have a steeper rate of decline in employment beginning at age 60, with both groups falling to employment rates of below 10% by age 65.

The combination of large improvements in schooling over time and the strong positive relationship between schooling and employment should create a tendency for increasing employment rates for older South Africans over time. This may be especially true for women, where the impact of schooling on employment is especially large. It is also important to recognize that the steep decline in average employment rates of Africans between age 55 and 70 may be exaggerated by the changes in schooling over these age groups. Some of the apparent effect of age may actually be due to cohort effects, with the higher education levels of younger cohorts leading to higher rates of employment. A comparison of Figure 2 and Figure 8 provides some support for this interpretation, since the age profiles of employment for specific schooling groups in Figure 8 appear to decline less steeply than the average age profiles for all African males and females in Figure 2.

Geographic differences in work activity of the elderly

Employment patterns can differ substantially between provinces and between rural and urban regions in South Africa. The large sample size of the 1996 makes it possible to analyze spatial variation in work activity of the elderly. Table 5 presents employment rates for African men and women and 55-69 for rural and urban regions of each of South African's nine provinces. The table indicates that employment rates are substantially higher for the urban elderly for both men and women. There are large differences in employment rates across locations. Only 15% of rural men age 55-69 are employed in the Eastern Cape, compared to almost 50% of urban men in the Western Cape and Gauteng. Rural employment rates are generally lower than urban employment rates, although this is not true in all provinces. Looking at the Eastern Cape, Northern Province, and Kwa-Zulu Natal, three large provinces with large rural populations (and large sample sizes), the employment rate for 55-69 year-old men is at least 20 percentage points higher in urban areas.

6. Probit Regressions

In order to get a clearer picture of the variables affecting the work activity of the elderly in South Africa, we estimate probit regressions of the probability of employment. The regressions

are estimated for the sample of Africans age 50-75, with separate regressions estimated for men and women. Two specifications are used in the regressions. The first regression includes years of schooling, dummy variables for marital status, a flexible parameterization of the age profile, and dummy variables for province and urban residence. The second regression adds measures of household composition. Household living arrangements are likely to be endogenous, determined jointly with decisions about labor supply, so these variables are included simply to indicate the association between living arrangements and elderly labor supply and not as indicators of causation.

Table 6 presents the estimates of these probit regressions. Regressions 1 and 2 present estimates of the first specification for females and males, respectively. As suggested by Figure 8 above, the coefficient on years of schooling is positive and highly significant for both males and females. The *dF/dx* column indicates that one year of additional schooling is associated with 1.1 percentage point increase in the probability that a woman works, evaluated at the sample means of the independent variables. The coefficient on schooling in the male regression is about half the size of the schooling coefficient for women. This translates into a similar percentage point increase in schooling, although it is a smaller proportional change for men given their higher levels of employment.

The marital status dummies, with married as the omitted category, indicate that unmarried women are significantly more likely to work, controlling for all of the other variables in the regression, with the largest effect for divorced women. Evaluated at sample means, the percentage increase in the probability of work compared to married women is 2 percentage points for widows, 9 percentage points for divorced women, and 5 percentage points for women who have never married. The effects of marriage for men go in the opposite direction, with married men having significantly higher probabilities of employment than widowed, divorced, or never married men. Married men have probabilities of employment over 10 percentage points higher than men in any of the other categories of marital status, even with very flexible controls for age.

We include a cubic function of age in order to permit a flexible shape for the age-employment profile. In addition to the cubic we include two dummy variables permitting shifts in the age profile at age 60 and 65. The age 60 dummy is equal to one for age 60 and above; the

age 65 dummy is equal to one for age 65 and above. For women we estimate a significant decline in employment probabilities at age 60, the age at which women become eligible for the state old age pension. While this effect is statistically significant, the implied decrease of 1.7 percentage points in the probability of work for women who have become pension eligible is relatively modest in light of the very large percentage of women who begin to receive the pension at age 60. We estimate a positive effect of the age 65 dummy for women, although the coefficient is only statistically significant at the 10% level. For men the coefficient on the age 60 dummy is not statistically significant, but we estimate a significant negative effect of the age 65 dummy. This suggests that men speed up their withdrawal from employment when they reach the age of eligibility for the old age pension. As was the case with women reaching age 60, however, the magnitude of the reduction in employment for men who reach age 65 is relatively modest, implying a decrease of 3 percentage points in the probability of working for a man with mean characteristics. Given the large proportion of men who begin to receive the pension at age 65, the corresponding reduction in the proportion working is relatively small. This is presumably due to two factors. One effect is that many men are clearly not postponing retirement until they reach pension age. The second effect is that men do not necessarily have to stop working when they begin receiving the pension.

The coefficient on the urban dummy indicates that both men and women are significantly more likely to work in urban areas, with a larger coefficient for women. The substantial differences in employment across provinces shown in Table 5 continue to be observed when we control for education, age, and marital status. In comparison to the omitted province of Western Cape, there are significantly lower probabilities of employment for both women and men in Eastern Cape, Northern Cape, Kwa-Zulu Natal, and Northern Province. Gauteng has higher rates of employment than Western Cape for women, but lower rates of employment for men.

Regressions 3 and 4 add three household composition variables to the regression – the number of household members under the age of 18, the number of males age 18-59, and the number of females age 18-59. The number of household members under age 18 is negatively associated with the employment of both men and women, with a larger coefficient for women. This may reflect a tradeoff between labor market work and caring for grandchildren, especially for women. The number of adult men in the household is negatively associated with the employment of women, with an insignificant coefficient on the employment of men. The effect

of adult women goes in the opposite direction, with a positive effect of the number of women age 18-59 on women's employment and a negative effect on men's employment. Since we have controlled for the presence of children, the positive effect of women age 18-59 may indicate that older women are less needed for childcare responsibilities if the children's mother is in the household. The negative relationship between the number of women age 15-19 and the employment of older males may be a reminder of the endogeneity of household composition. Men who are unable to work because they are in poor health may also be more likely to have adult daughters living in their household as caretakers. This is an important caution regarding all of these household composition variables. Since the living arrangements of the elderly are likely to be influenced by many of the same unobservable variables that affect labor supply, the coefficients on these household composition variables should not be given a causal interpretation.

Conclusions

Our analysis of South African census and survey data indicates that withdrawal from the labor force occurs at a fairly rapid rate above age 50. According to 1996 census data, male participation rates fall from around 80% at age 50 to 50% at age 60 and 10% at age 70, with relatively small differences across the four main population groups. Participation rates for women are considerably lower at all ages, falling from around 60% at age 45 to 20% at age 60 and under 5% at age 70. Using the metric of unused productive capacity developed by Gruber and Wise (1999), this profile of withdrawal from the labor force leads to somewhat less unused capacity than that observed in most European countries, and slightly more unused capacity than that observed in the United States.

South Africa's non-contributory old age pension system is triggered almost entirely by simple age eligibility rules, with women becoming eligible at age 60 and men becoming eligible at age 70. Although the pension does not necessarily imply a tax on work, especially for low-wage workers, we find evidence that the age of pension eligibility is associated with increased rates of retirement. The fraction of women receiving the pension jumps from under 10% at age 59 to almost 70% at age 61, with the pension becoming almost 50% of household income for women age 61. Corresponding to the age of pension eligibility is an increase in the hazard rate of leaving employment for women from 5% at age 58 to over 30% at age 60. There is also

evidence that men retire at a faster rate when they reach the pension-eligibility age of 65, with the hazard rate rising to around 25%. This effect at exactly age 65 is relatively modest, however, especially in comparison to the hazard rates as high as 60% at key program eligibility ages in European countries. The effect of reaching pension age appears to be smoothed out over age 65, 66, and 67 for African males, a difference from the sharp effects observed at exact ages of program eligibility in European countries.

We find large effects of schooling on employment of the elderly in South Africa. Our probit regressions imply a 1.1 percentage point increase in the probability of employment for each year of schooling for both men and women. Since schooling levels rise rapidly from older ages to younger ages, especially for Africans, this implies that employment rates at older ages may increase in the future. Employment rates at older ages may also be pushed upward by the fact that younger cohorts are more likely to live in urban areas, since we estimate a substantial positive effect of urban residence on employment.

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Table 1. Percentage in various categories of labour market status, African Males and Females, 2000-01 Labour Force Survey

Age Group	Percent Working by Category of Work						Percent Unemployed		Percent In Labor Force	
	Work for pay (not domestic)	Work as domestic worker	Work in own business	Work on family plot	Unpaid family business	Total	Narrow	Broad	Narrow	Broad
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Males										
45-49	53.9%	2.1%	10.6%	3.7%	0.5%	68.6%	14.4%	22.1%	83.3%	91.0%
50-54	47.6%	2.8%	10.0%	5.5%	0.3%	63.6%	11.9%	20.9%	75.8%	84.8%
55-59	41.3%	2.9%	10.9%	6.5%	0.1%	59.3%	10.5%	17.8%	70.4%	77.7%
60-64	26.1%	3.5%	10.6%	7.1%	0.4%	45.8%	5.1%	10.6%	51.4%	56.8%
65-69	10.6%	0.4%	5.9%	9.9%	0.1%	25.3%	1.5%	5.0%	27.2%	30.7%
70-74	3.5%	1.3%	5.2%	8.9%	0.5%	18.2%	0.7%	2.2%	19.0%	20.5%
75-79	2.0%	0.4%	3.3%	9.5%	0.0%	15.2%	0.6%	1.5%	16.1%	16.9%
Females										
45-49	22.5%	15.1%	11.4%	5.3%	0.7%	52.7%	13.1%	27.4%	66.2%	80.5%
50-54	20.5%	14.2%	11.7%	5.3%	0.5%	49.9%	8.4%	19.7%	58.7%	70.0%
55-59	15.6%	12.8%	9.5%	5.4%	0.3%	41.7%	5.7%	14.5%	47.8%	56.6%
60-64	5.2%	4.2%	5.4%	7.3%	0.4%	21.9%	1.6%	4.1%	23.8%	26.4%
65-69	1.8%	1.8%	4.1%	6.7%	0.3%	13.7%	0.7%	2.4%	14.5%	16.2%
70-74	0.8%	0.4%	2.7%	5.5%	0.2%	9.5%	0.1%	0.8%	9.8%	10.5%
75-79	0.4%	0.1%	1.1%	6.0%	0.0%	7.4%	0.3%	0.6%	7.9%	8.2%

Note: Columns 2-6 are not mutually exclusive. Column 7 is based on answers to questions shown in columns 2-6, but avoids double counting; Column 10 is sum of 7+8; Column 11 is sum of 7+9

Table 2. Household Living Arrangements and Marital Status, 1996 Census

Age Group	N	Number living in household: Total	Under age 18	Age 18-59	Pension eligible	Percent living alone	Percent living only with spouse	Marital status: Married	Widowed	Divorced
African females										
30-34	107,518	5.48	2.58	2.64	0.27	4.82	6.74	54.2	1.6	3.1
35-39	88,934	5.48	2.65	2.60	0.24	4.92	6.32	60.0	3.4	5.0
40-44	70,255	5.58	2.51	2.86	0.22	4.73	6.20	61.8	6.2	6.5
45-49	53,244	5.65	2.35	3.08	0.21	5.04	5.84	62.2	9.8	6.8
50-54	40,176	5.69	2.28	3.16	0.21	5.07	5.91	60.6	14.9	6.2
55-59	36,594	5.77	2.34	3.07	0.27	5.00	5.64	57.9	21.1	5.1
60-64	34,811	5.87	2.49	2.00	1.35	4.81	5.05	54.2	29.1	3.8
65-59	30,084	5.88	2.57	1.98	1.34	4.90	4.73	50.3	35.8	3.0
70-74	17,298	5.84	2.52	2.04	1.32	5.19	4.54	45.3	41.6	2.4
African males										
30-34	85,148	4.79	1.66	2.86	0.26	11.18	8.79	48.9	0.3	1.5
35-39	73,514	4.81	1.92	2.66	0.24	10.28	9.06	63.1	0.6	2.7
40-44	58,406	5.02	2.10	2.72	0.21	9.77	8.88	71.3	1.1	3.5
45-49	45,283	5.16	2.05	2.93	0.19	9.91	9.03	74.9	1.7	4.0
50-54	32,741	5.36	2.04	3.16	0.17	9.44	8.90	77.0	2.9	3.9
55-59	26,819	5.50	2.06	3.28	0.18	9.74	8.64	78.4	4.3	3.6
60-64	19,458	5.66	2.13	2.25	0.30	8.61	8.45	78.3	6.2	3.2
65-59	18,305	5.83	2.27	2.10	1.49	7.47	7.67	79.1	8.4	2.5
70-74	11,220	5.92	2.32	2.03	1.61	6.64	7.71	76.6	11.6	2.3
White females										
30-34	15,280	3.82	1.55	2.15	0.11	4.16	9.98	80.2	0.9	8.3
35-39	15,534	4.05	1.71	2.21	0.13	3.54	7.09	81.4	1.6	9.8
40-44	14,295	3.88	1.26	2.48	0.15	3.98	10.01	80.8	2.6	10.8
45-49	13,274	3.44	0.63	2.65	0.15	5.39	18.59	79.4	4.6	11.4
50-54	11,593	3.02	0.32	2.48	0.16	7.59	31.81	77.8	7.9	10.3
55-59	9,792	2.70	0.24	1.98	0.22	11.27	41.41	73.1	14.3	8.9
60-64	8,331	2.56	0.24	0.63	1.45	15.68	44.72	66.4	22.8	7.2
65-59	7,387	2.41	0.24	0.56	1.57	24.02	40.76	55.4	34.7	6.0
70-74	5,867	2.36	0.22	0.60	1.52	30.48	34.84	45.7	46.5	3.9
White males										
30-34	14,397	3.56	1.23	2.21	0.11	6.79	14.09	77.3	0.3	5.4
35-39	14,940	3.91	1.59	2.19	0.13	5.39	8.93	83.0	0.5	6.9
40-44	13,662	4.01	1.51	2.37	0.14	4.65	8.75	85.9	0.7	7.3
45-49	12,762	3.72	0.95	2.64	0.14	5.28	14.22	85.5	1.1	8.1
50-54	11,171	3.32	0.51	2.68	0.14	5.47	25.32	86.3	1.7	7.5
55-59	9,138	2.97	0.30	2.52	0.16	5.66	40.19	87.4	2.7	5.9
60-64	7,537	2.73	0.22	1.09	0.41	6.73	51.19	86.4	4.8	4.8
65-59	6,244	2.53	0.17	0.65	1.71	8.25	58.42	85.1	7.2	4.1
70-74	4,584	2.52	0.19	0.53	1.81	9.18	59.93	82.4	10.3	3.1

Table 3. Percentage working by pension status, African males and females, September 2000 LFS

			Not receiving pension			*Receiving pension*		
				Percent working			Percent working	
Age Group	*N*	Percent receiving pension	*N*	Broad	Narrow	*N*	Broad	Narrow
Males								
50-54	1,253	1.6	1,233	67.2	62.3	20	13.6	7.1
55-59	884	2.4	857	66.7	61.0	27	20.8	9.1
60-64	776	14.6	653	53.8	47.1	123	13.0	6.8
65-69	548	63.8	201	46.6	41.0	347	21.9	6.6
70-74	415	84.4	66	26.3	17.0	349	18.7	7.9
75-79	228	86.9	31	20.2	20.2	197	17.6	3.3
Total	4,104	24.9	3,041	61.9	56.4	1,063	18.9	6.5
Females								
50-54	1,520	1.8	1,487	55.3	49.5	33	28.2	13.1
55-59	1,136	6.8	1,064	46.4	40.7	72	14.0	4.3
60-64	1,253	62.9	459	43.1	33.7	794	20.7	7.5
65-69	859	85.2	127	27.4	22.5	732	16.7	5.5
70-74	768	90.4	75	11.3	7.7	693	11.8	3.0
75-79	380	93.1	25	21.3	2.0	355	9.1	1.4
Total	5,916	43.6	3,237	48.5	42.2	2,679	15.5	4.9

Note: Broad measure of work includes work on family plot; narrow measure does not.

Table 4. Schooling Attainment of African Males and Females by Age Group, 1996 Census

Age Group	Mean Years Schooling		*Percentage completing*							
			Zero schooling		At least 4 years		At least 7 years		At least 12 years	
	Female	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*
30-34	7.32	7.60	16.1	14.1	80.5	82.3	64.2	66.3	18.7	21.6
35-39	6.39	6.87	22.1	18.1	73.8	77.5	55.5	59.7	13.3	16.1
40-44	5.43	5.93	28.9	24.4	66.2	70.6	46.3	51.2	8.7	11.2
45-49	4.74	5.15	34.9	30.9	60.1	63.7	40.0	43.7	5.9	7.7
50-54	4.21	4.58	40.4	36.7	54.7	57.7	35.2	38.5	4.3	5.9
55-59	3.43	3.87	50.0	44.4	45.0	49.5	27.7	31.3	3.2	4.4
60-64	2.89	3.41	56.2	50.5	38.8	43.8	22.3	27.2	2.3	3.9
65-59	2.19	2.65	65.7	59.4	29.9	35.0	16.2	19.8	1.6	2.8
70-74	2.13	2.31	66.3	63.8	29.3	31.0	15.4	16.7	1.5	2.3

Table 5. Percentage Working by Province and Urban Residence, Africans Age 55-69, 1996 Census

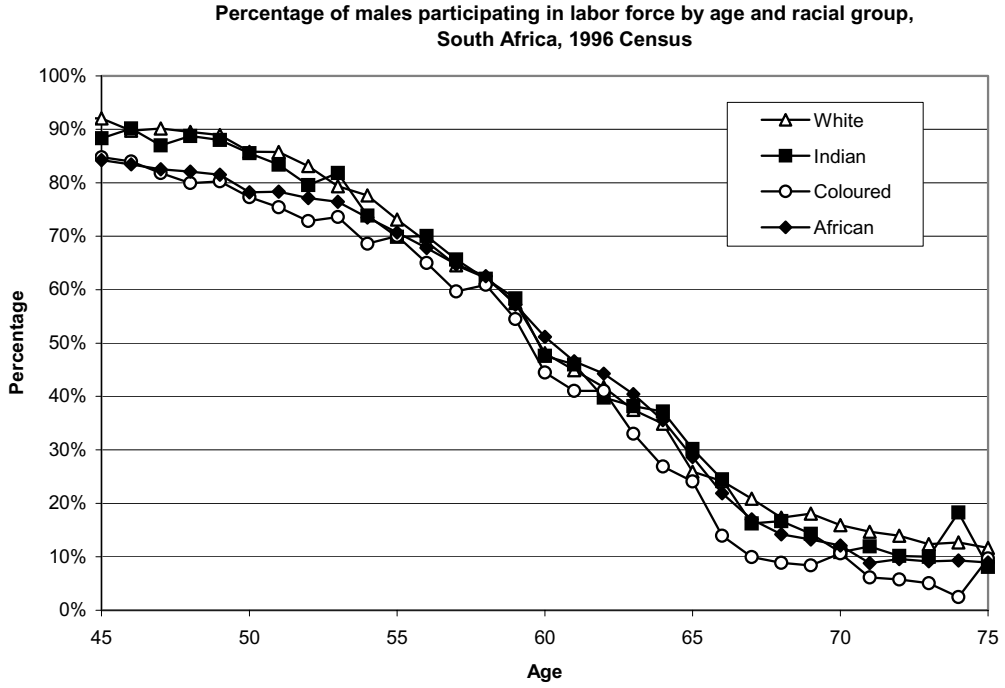
	Female				*Male*			
		Percent	Percent working			Percent	Percent working	
Province	**N**	**Urban**	**Rural**	**Urban**	**N**	**Urban**	**Rural**	**Urban**
Western Cape	1,556	97.4	39.0	26.9	1,722	91.46	84.4	49.1
Eastern Cape	22,554	21.4	5.1	21.4	13,057	25.73	14.6	36.3
Northern Cape	814	86.4	25.2	13.2	710	78.73	72.8	32.0
Free State	6,401	71.1	17.6	16.9	4,595	65.70	56.5	36.3
KwaZulu-Natal	21,880	25.4	6.1	24.2	12,230	28.30	22.8	42.0
North West	8,884	28.9	11.3	20.7	7,083	29.01	34.6	40.3
Gauteng	12,150	98.1	44.4	28.6	9,927	96.30	73.3	49.2
Mpumulanga	6,716	29.6	11.7	17.3	4,563	31.32	43.2	44.7
Northern Province	16,322	6.2	6.2	19.9	7,927	8.68	23.3	49.6
Total	97,277	35.6	7.3	23.5	61,814	41.59	26.6	43.7

Table 6. Probit regressions for employment, Africans age 50-75, 1996 Census

	Probit regression coefficients and robust standard errors											
	Female			Male			Female			Male		
Variable	*Regression 1*			*Regression 2*			*Regression 3*			*Regression 4*		
	b	***SE***	***dF/dX***	***b***	***SE***	***dF/dX***	***b***	***SE***	***dF/dX***	***b***	***SE***	***dF/dX***
Years of schooling	0.065	(0.001)***	0.011	0.031	(0.001)***	0.011	0.063	(0.001)***	0.011	0.030	(0.001)***	0.011
Widowed	0.109	(0.011)***	0.019	-0.356	(0.022)***	-0.115	0.102	(0.012)***	0.018	-0.387	(0.022)***	-0.124
Divorced	0.425	(0.019)***	0.092	-0.440	(0.027)***	-0.138	0.398	(0.019)***	0.084	-0.494	(0.027)***	-0.152
Never married	0.246	(0.013)***	0.047	-0.484	(0.015)***	-0.154	0.215	(0.013)***	0.040	-0.514	(0.015)***	-0.162
Age >=60	-0.099	(0.025)***	-0.017	0.024	(0.024)	0.008	-0.070	(0.025)***	-0.012	0.017	(0.025)	0.006
Age >=65	0.053	(0.030)*	0.009	-0.090	(0.028)***	-0.032	0.048	(0.030)	0.008	-0.094	(0.028)***	-0.033
Age-50	0.035	(0.009)***	0.006	0.027	(0.009)***	0.009	0.031	(0.009)***	0.005	0.025	(0.009)***	0.009
(Age-50) squared	-0.011	(0.001)***	-0.002	-0.009	(0.001)***	-0.003	-0.011	(0.001)***	-0.002	-0.009	(0.001)***	-0.003
(Age-50) cubed	0.000	(0.000)***	0.000	0.000	(0.000)***	0.000	0.000	(0.000)***	0.000	0.000	(0.000)***	0.000
Urban	0.420	(0.012)***	0.077	0.191	(0.012)***	0.068	0.386	(0.012)***	0.069	0.173	(0.012)***	0.062
Eastern Cape	-0.321	(0.031)***	-0.049	-0.695	(0.029)***	-0.216	-0.312	(0.031)***	-0.047	-0.674	(0.029)***	-0.211
Northern Cape	-0.207	(0.054)***	-0.031	-0.131	(0.049)***	-0.045	-0.196	(0.054)***	-0.029	-0.117	(0.049)**	-0.040
Free State	0.029	(0.033)	0.005	-0.112	(0.030)***	-0.039	0.033	(0.033)	0.006	-0.100	(0.030)***	-0.035
KwaZulu-Natal	-0.127	(0.031)***	-0.021	-0.422	(0.028)***	-0.139	-0.101	(0.031)***	-0.016	-0.390	(0.028)***	-0.129
North West	-0.004	(0.032)	-0.001	-0.186	(0.029)***	-0.064	0.003	(0.032)	0.000	-0.173	(0.029)***	-0.059
Gauteng	0.138	(0.030)***	0.025	-0.064	(0.028)**	-0.023	0.129	(0.030)***	0.023	-0.062	(0.028)**	-0.022
Mpumulanga	0.108	(0.034)***	0.020	0.013	(0.031)	0.005	0.117	(0.034)***	0.021	0.031	(0.031)	0.011
Northern Province	-0.089	(0.033)***	-0.015	-0.440	(0.030)***	-0.142	-0.082	(0.033)**	-0.013	-0.415	(0.030)***	-0.134
Number <18							-0.069	(0.003)***	-0.012	-0.038	(0.003)***	-0.013
Males 18-59							-0.032	(0.004)***	-0.005	-0.003	(0.004)	-0.001
Females 18-59							0.031	(0.005)***	0.005	-0.013	(0.004)***	-0.005
Constant	-1.024	(0.036)***		0.274	(0.034)***		-0.868	(0.038)***		0.379	(0.035)***	
Sample size	145,309			97,631			145,309			97,631		
Pseudo R-squared	0.217			0.174			0.224			0.177		
Log likelihood	-48636			-52315			-48213			-52142		

Notes: Robust standard errors in parentheses. Significance levels: ***=.01, **=.05, *=.1. Omitted categories: Married, Western Cape.

Figure 1. Labor Force Participation Rates for Males and Females



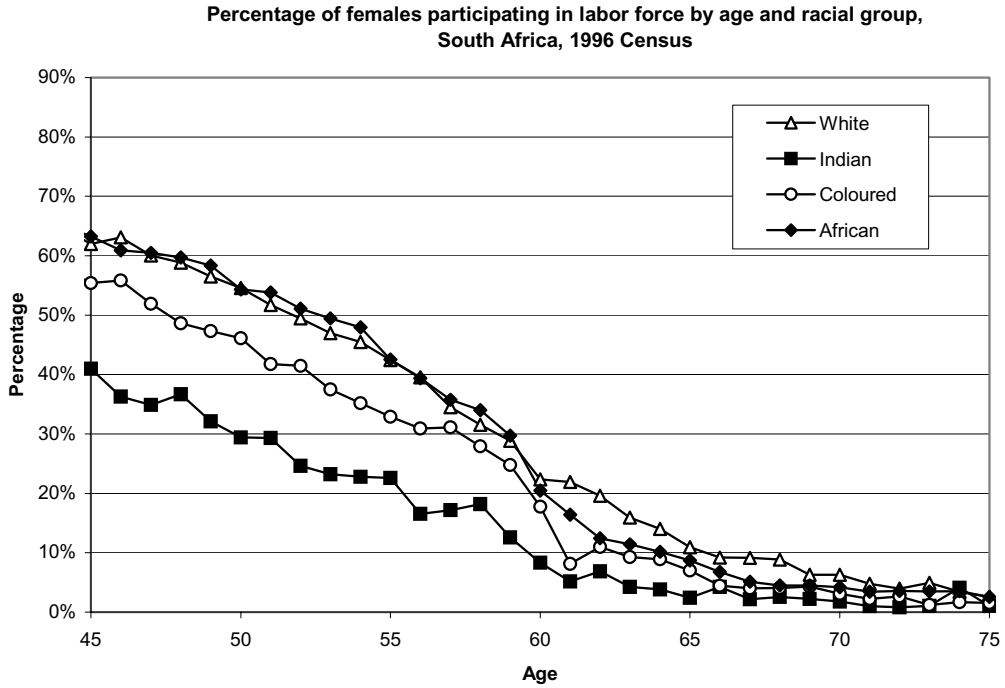


Figure 2. Distribution of Labor Force Activity by Age, African and White Males and Females South Africa, 1996 Census

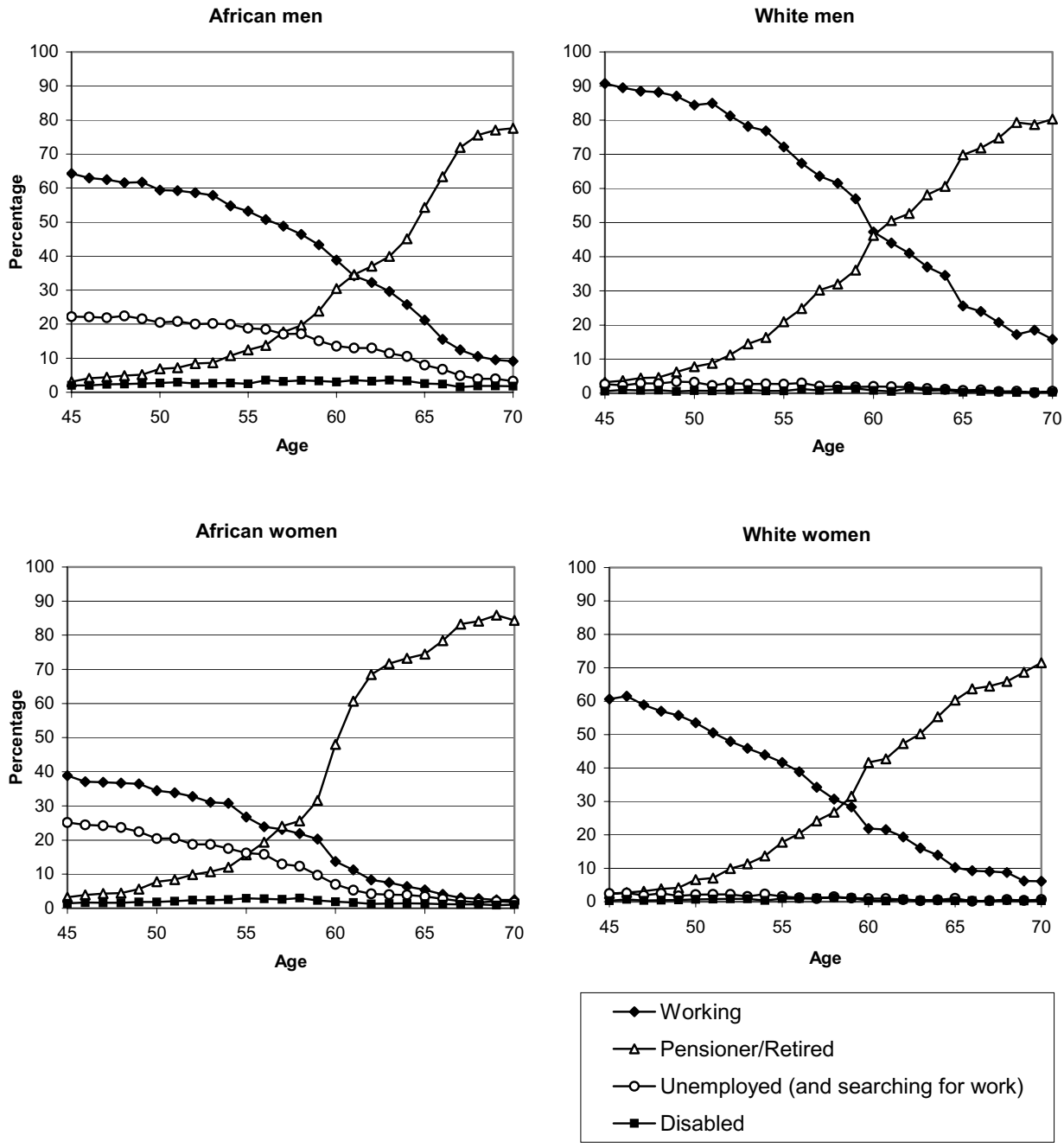
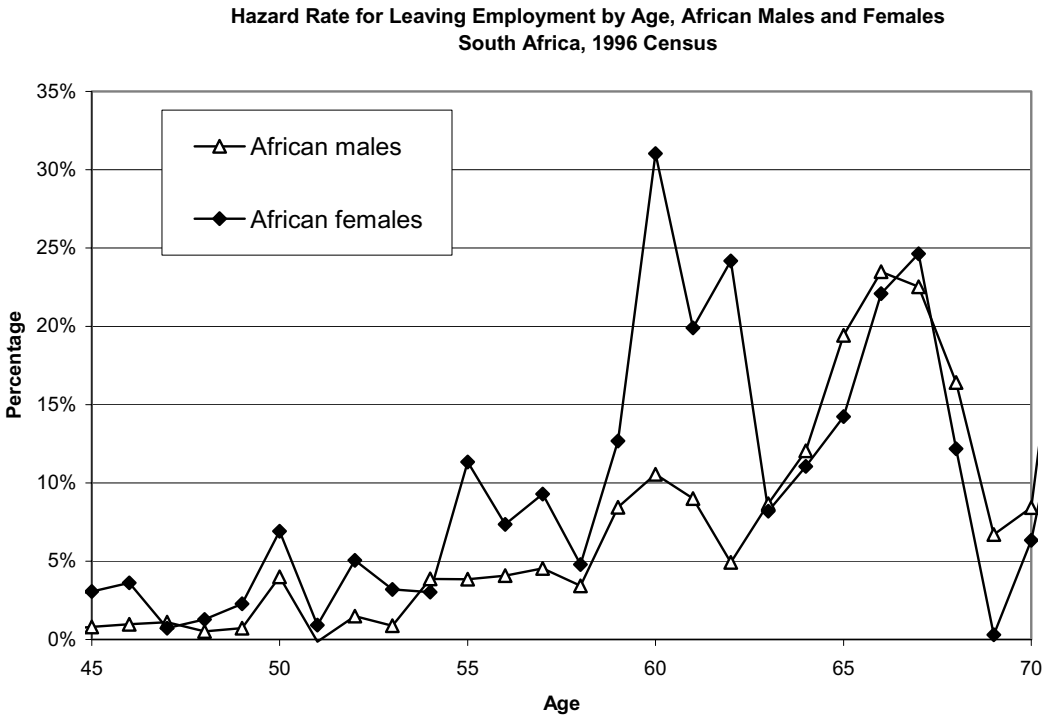


Figure 3. Hazard Rate for Leaving Employment



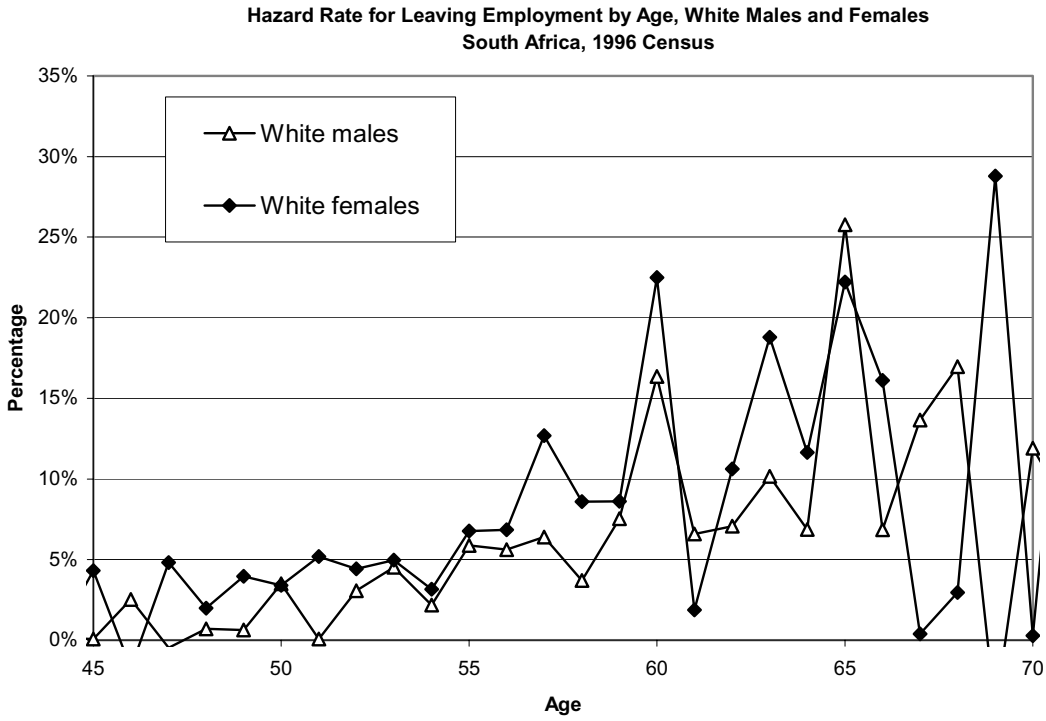
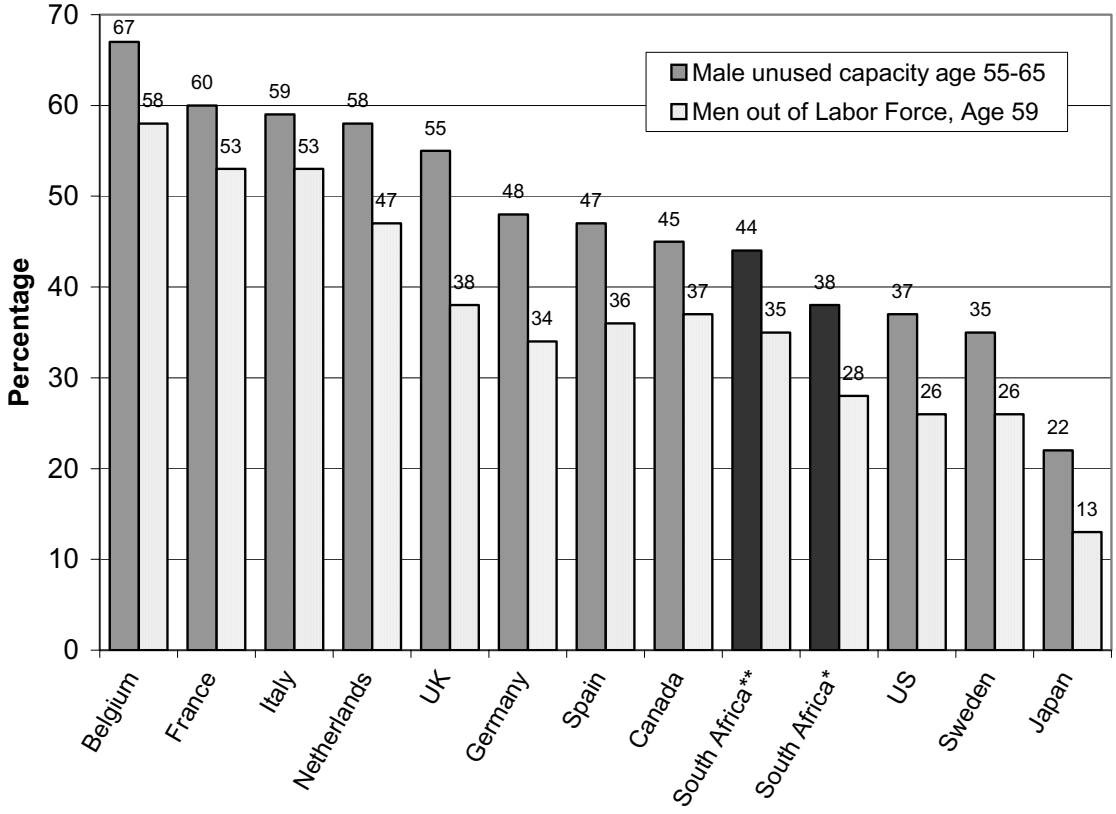


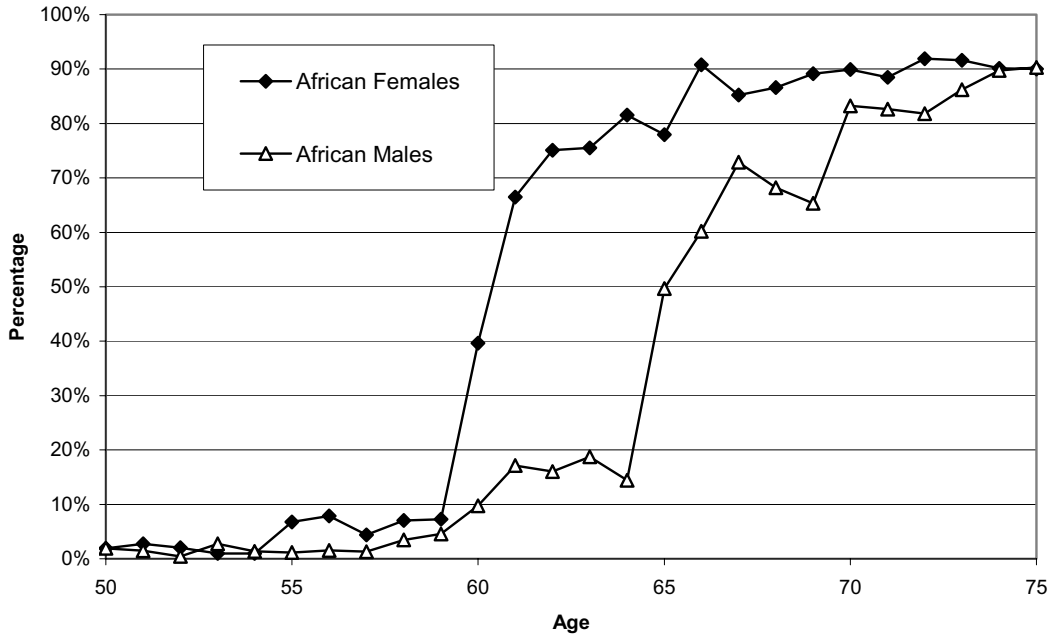
Figure 4. Measures of Unused Productive Capacity for OECD Countries and South Africa



Notes: OECD estimates taken from Gruber and Wise, 1999; South Africa estimates are based on 2000-01 Labour Force Survey; *Narrow measure of participation; **Broad measure of participation

Figure 5. Percentage Receiving Old-Age Pension, September 2000 LFS

Africans



Whites

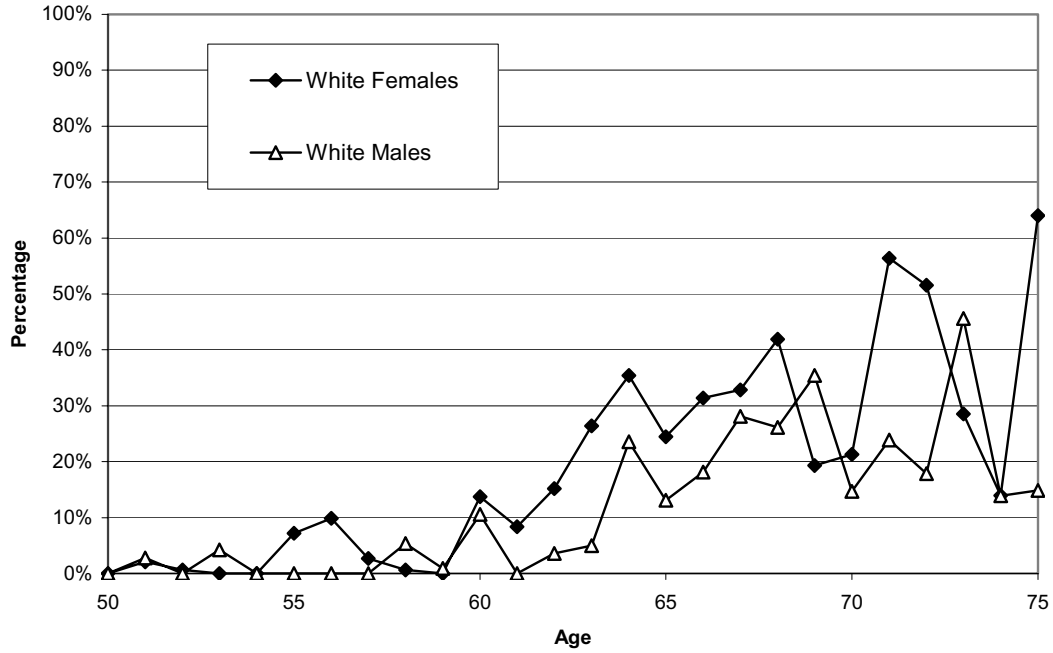


Figure 6. Mean proportion of household income derived from Old Age Pension, LFS/IES September 2000

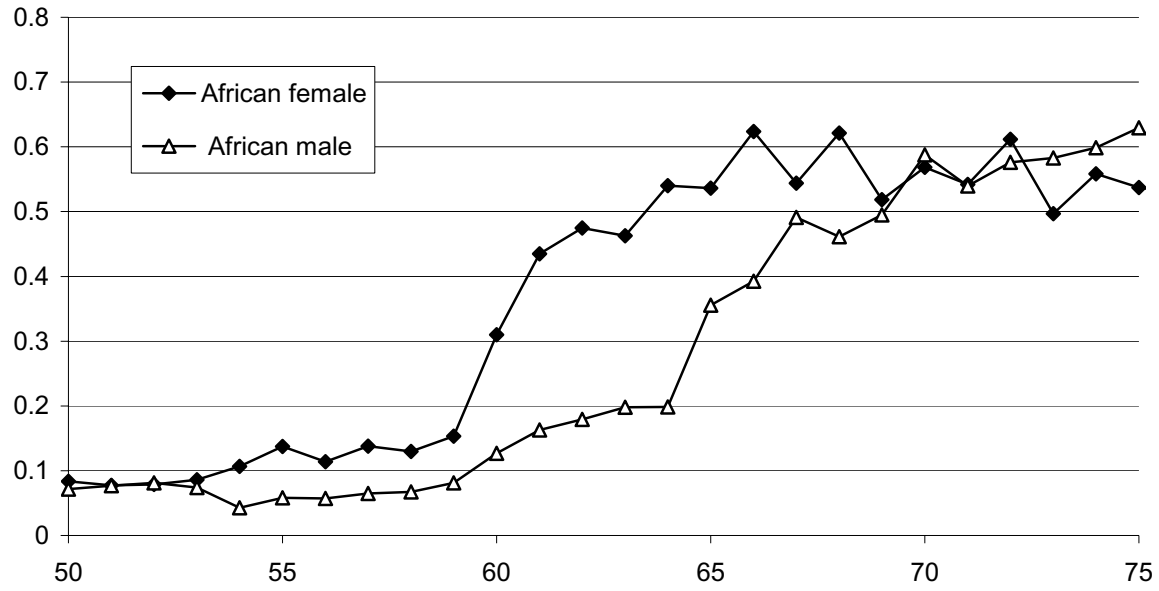
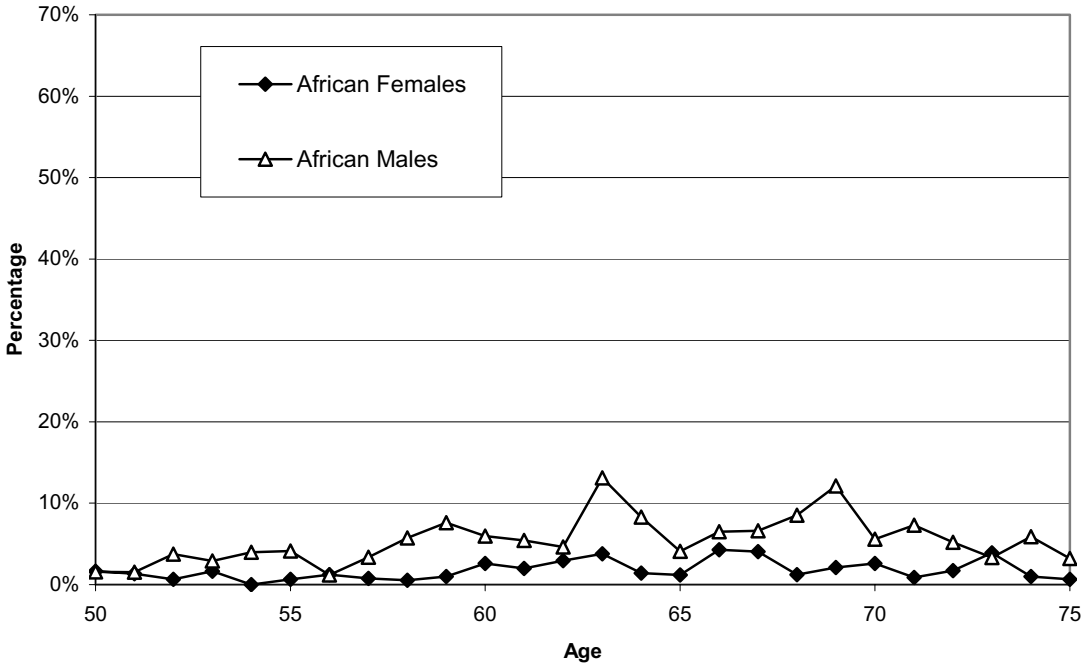


Figure 7. Percentage Receiving Employer-Provided Pension, September 2000 LFS

Africans



Whites

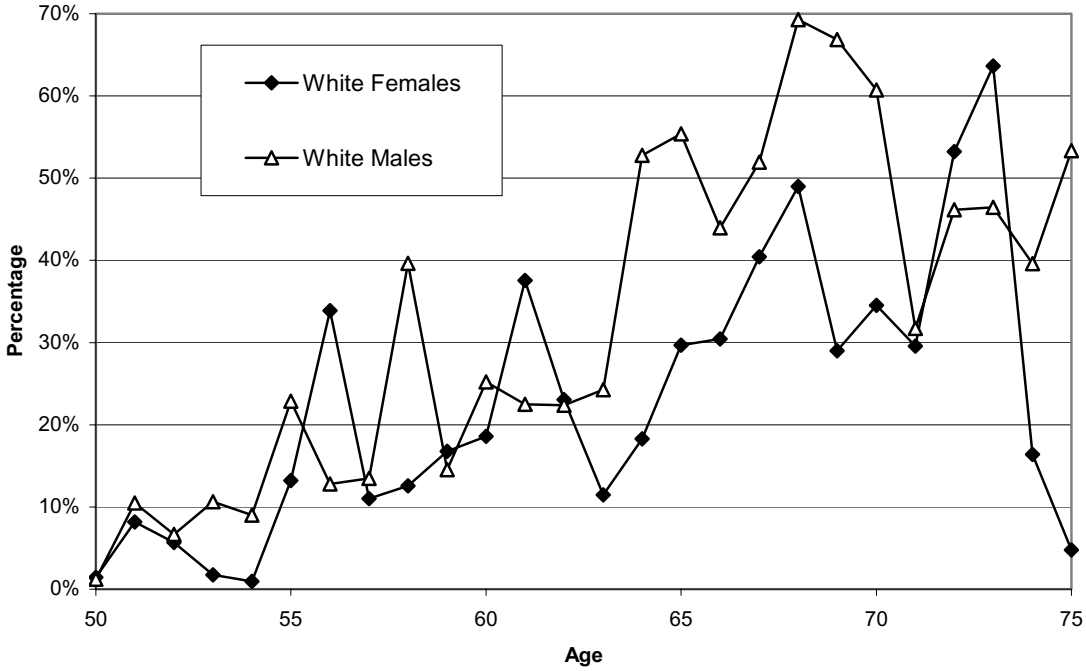
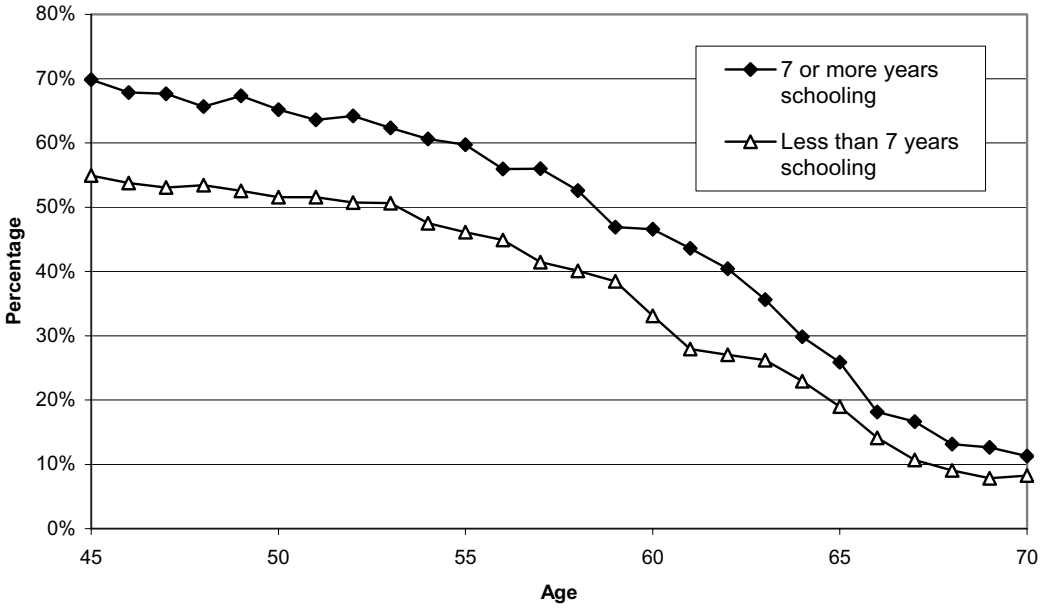


Figure 8. Percentage Working by Years of Schooling, African Males and Females, 1996 Census

African Males



African Females