

# **Job search in South Africa: A nonparametric analysis\***

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An approach to South African unemployment based on the perspectives of search theory suggests that labour market flows are very important. We present some evidence on what these flows might look like, based on three cross-sectional surveys. We use changes between age cohorts as proxies for the intertemporal changes involved. Our analysis suggests that there are two types of unemployment: a large spike of youth unemployment and a much longer term labour absorption problem. We also suggest that the education system does not provide effective signals to employers and that search and screening costs of employers may explain some of the dynamics of South African unemployment.

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## 1 Introduction

The debate about unemployment in South Africa has for some time tended to concentrate on the *levels* involved. Indeed, these seem to be extraordinarily high. A 1998 study (Klasen and Woolard 1998, Table 1, p.10) suggested that unemployment is in the range 12.7% to 20.2% on a ‘strict’ interpretation and in the range 28.6% to 32.1% according to a ‘broader’ conception of unemployment. These figures have seemed so extreme that various authors have questioned whether they are credible or not (Standing, Sender and Weeks 1996). The sorts of questions which have been asked concentrate firstly on the issue of how these large masses of unemployed manage to survive and indeed eke out a living. It has been suggested that most of them must be engaged in informal activities (and hence not be unemployed) if they manage to make a living. Secondly it has been asked whether the ‘unemployment’ that is recorded in the data sets on which these estimates are based corresponds in any meaningful way with the economic concept of unemployment. Thirdly it might be asked how society has managed to cope with these levels of unemployment.

These are all important questions and we will try to address at least some of them indirectly in this paper. Nevertheless while debates about the appropriate measurement of the level of unemployment are, indeed, important, theoretical work in the last two decades has focussed increasingly on the *flows* between labour market states. Search theory (see for example Devine and Kiefer (1991), Mortensen and Pissarides (1999), Pissarides (2000)) departs from the assumption that there are intrinsic frictions which prevent market clearing in the short run. Indeed if there is turnover in employment, then the only notion of equilibrium which makes sense is one in which the flows out of employment are balanced by the flows into employment. In this sit-

uation markets never clear: there are always individuals who wish to work and employers who could profitably employ them, but they first have to find each other.

A focus on flows is, of course, not at variance with the analysis of levels. Indeed the stocks and flows are related to each other. The equilibrium stocks can be deduced from the various flow rates. In this paper, however, we will turn this relationship on its head. We will try to infer something about the flow rates and the underlying patterns of search from the observed stocks. Furthermore, we will estimate these stocks using nonparametric techniques. We will argue that our approach throws new light on the experience of unemployment. In particular it suggests that there are two kinds of unemployment problems. On the one hand there is a long-term labour absorption problem: at maximum only 70% of African men find employment. On the other hand, there is a very severe short-term unemployment “spike” at around age 27. This is due to the difference in the flow rates of young males out of the schooling system and their absorption into work (or other activities).

We will also present some analyses which suggest that the relevant flow rates differ by gender, race and location. Interestingly enough, we will suggest that education only makes a sharp difference in the probability of finding a job once one gets beyond the matric qualification. We will suggest that our results are consistent with a story in which education does not provide a sufficiently good signal about worker quality to potential employers. This in turn might explain why employers frequently seem to hire new workers through “insider” networks. We will present some anecdotal evidence for this proposition.

The structure of the paper is as follows: In Section 2 we briefly review some of the key outlines of the theoretical literature dealing with search and

with South African unemployment. In Section 3 we outline the empirical methodology. Section 4 proceeds to the empirical analysis. This section focusses on some of the racial and gender contrasts, and it analyses the experience of African men in more detail. We look at the contrast between rural and urban areas as well as the role of education in section 5. In Section 6 we briefly consider the problem of search from the point of view of the employer and section 7 concludes.

## **2 Search theory and South African unemployment**

### **2.1 Theoretical perspectives**

The basic framework of the search approach to labour market interactions is well reviewed in a number of places (see for example Devine and Kiefer (1991), Mortensen and Pissarides (1999)). We will not rehearse the arguments here. The basic insight is that there are intrinsic search frictions which will prevent market clearing in the short run, even with arbitrarily large shifts in prices. These search frictions involve asymmetries of information (a potential worker may not read the newspaper in which a job is advertised), screening costs and the fact that any contract needs to bring the potential worker and the firm into spatial and temporal proximity.

Given that search takes time and involves cost, it can be seen as a form of investment. Search costs are incurred now, in the hope of a pay-off in the future. One of the implications of this is that workers should not always take the first job that becomes available, since the value of that job may be lower than the opportunity cost - the potential gain from getting a much better job later. Implicit in this is, of course, the assumption that jobs are not created equal: that the same worker in a different job may get better remunerated. The reason for this heterogeneity is often modelled as arising out of match-

specific productivities, that the “chemistry” between some firms and some workers just makes for a more productive match than would otherwise be the case. For similar reasons, firms should not always hire the first worker that presents herself. Indeed, firms will generally engage in just as energetic a search for suitable hires as workers will search for jobs.

It can be shown that with these assumptions workers should operate with a “reservation wage” policy, except that the reservation wage should be set not just to cover the cost of the leisure foregone, but also the opportunity cost of foregoing additional search. Taking a job (or hiring a worker) is a little like incurring sunk costs. Dissolving a match would mean writing off this investment. Furthermore there may be additional costs incurred in breaking the match. The extent of these costs will determine how willing the parties are to enter into the contract in the first place. Similarly, firms should operate with a “reservation productivity” policy, i.e. they should only hire an individual if the productivity (as indicated by the screening procedures) is in excess of this reservation level.

One implication of this framework is that an unemployed person should always be thought of as being in transition: either into a job or out of the labour market. The key question is really the rate at which these transitions happen. In Figure 1 we have indicated some of the major flows that we would wish to focus on. We have also indicated (by means of a broken line) that the transition from not searching to searching (and vice versa) is not necessarily a discontinuous one: there may be different search intensities between different people (a model with endogenous search intensity is given in Pissarides 2000, Chapter 5). What determines whether someone is searching or takes up a job offer is essentially a comparison of the relevant capitalised values: of being in a job, of searching, or of engaging in other activities (see Dinkelman and

Pirouz (2001) for a South African analysis along these lines).

INSERT FIGURE 1 ABOUT HERE

As noted in the introduction, the equilibrium concept that is most natural in this framework is one in which the flows all balance, leaving no net changes in the underlying stocks. Pissarides (2000) presents a general equilibrium approach in this vein. This model has a strongly Schumpeterian flavour, in that the “creative destruction” of new technological innovations leads to a constant turnover of jobs. In his model the equilibrium unemployment rate is a function of

- the matching technology (i.e. the underlying search frictions)
- the rate of job creation, which is inter alia a function of the cost of creating a new vacancy, the profitability of a successful job and the expected duration of a successful match.
- the rate of match dissolutions which is inter alia a function of the arrival rate of negative productivity shocks and the cost of match dissolutions.

Where the South African literature has considered these issues, the focus has been most squarely on the last set of flows: the case of job destruction. Indeed there has been considerable anguish in the mass media about the reported levels of job losses in the formal sector during the 1990s.

Within the Pissarides framework, however, all of these issues are inter-related. Job destruction is only a problem if it is not counteracted by job creation. Indeed, evidence for the United States suggests that even in a “normal” capitalist economy these flows are truly enormous (Davis, Haltiwanger

and Schuh 1996). Furthermore these rates are interconnected: capitalists will be more reluctant to create vacancies if they know that it will be difficult to dissolve unproductive matches later. Similarly, if the matching technology is very inefficient, then it becomes very costly to create jobs, since a vacancy is likely to be kept open for a considerable period before a suitable candidate is found. In such situations, some employers may engage in labour “hoarding”, i.e. hold on to proven employees even when the current job is no longer profitable, in the hope that a positive economic shock will turn things around.

There is therefore considerable merit in attempting to put together an initial attempt to characterise some of these flows in the South African context. Indeed this may help to throw some light on the question about whether the reported levels of unemployment are at all plausible.

## 2.2 The South African debate

The debate about the reliability of South Africa’s unemployment statistics stems from the publication of the International Labour Organization’s (ILO’s) country report on South Africa (Standing et al. 1996). The doubts expressed by the authors can be divided into criticisms of the *time series* data and criticism of the *household survey* data.

As far as the former is concerned, there are two series in question: the Central Statistical Services’<sup>1</sup> (CSS’s) time series of employment and the ‘Standardised Employment Series’ (SES). The ILO team argues that the level of employment reflected in these series is almost definitely an underestimate. Among the reasons cited is that the labour force participation rates among African males seem to have dropped markedly since 1981. The

<sup>1</sup>Now referred to as Statistics South Africa

conclusion is that this ‘almost certainly’ indicates unmeasured economic activity (Standing et al. 1996, pp.58-59). Furthermore the authors note that the coverage of the CSS employment series seems inadequate, particularly when compared with the evidence of the cross-sectional surveys. Sectors in which the gap between the cross-sectional and the time series data was particularly large included trade, transport, financial services and government, community and social services. There were also shortfalls in agriculture and manufacturing, reflecting mainly an under-enumeration of the self-employed (Standing et al. 1996, pp.67-71). The ILO team points out that if employment is underestimated, then obviously the unemployment rate will be correspondingly overestimated.

The household surveys which come in for ILO criticism include the data from the Project for Statistics on Living Standards and Development (PSLSD) (SALDRU 1994) and the October 1994 Household Survey (OHS) of the CSS<sup>2</sup>. Part of the criticism is again focused on the coverage of people in employment, but a number of specific criticisms in relation to the definition of unemployment are also made. As for the former, it is argued that the household surveys tend to underenumerate people in hostels. This has led to a significant skewing of the employment figures, particularly in relation to the mining sector. It is also suggested that some informal activities are not adequately picked up by these surveys (Standing et al. 1996, pp.67-71). As for the definitions of unemployment, it is claimed that these are ‘generous’. The ‘*strict*’ definition of unemployment in the OHS includes people who would have been available for employment and who had taken active steps to find work in the preceding four weeks. The ILO suggests that this should have

<sup>2</sup>The 1995 OHS was not yet available at the time that the ILO report was written. It seems likely that the authors of the report would have levelled similar criticisms at this survey.



been restricted to the reference week only, which would obviously have reduced the number of unemployed. The ‘*broad*’ definition according to the CSS includes everyone who was not employed and available for work, irrespective of search activities (StatsSA 1996). The ILO argue that some time period should have been specified within which these ‘unemployed’ ought to have been available.

The most careful re-analysis of the evidence in the light of these criticisms has been done by Klasen and Woolard (Klasen and Woolard 1998). They argue that many of the criticisms of the time series data are undoubtedly valid. They concur with the ILO’s assessment that these data series do not offer a solid base for assessing changes in employment. They also concede that there is merit in many of the criticisms levelled at the sample surveys. Unlike the ILO team, however, they try to correct for these deficiencies as best they can. For example, they improve on the October Household Survey’s estimate of mining employment by using figures obtained from the industry itself. They also cross-check information from the household surveys against the income and expenditure surveys attached to the PSLSD and the 1995 OHS. They come to the conclusion that even if all the appropriate corrections are made, the estimates of unemployment do not shift by more than the odd percentage point.

Indeed, they make the point that it is surprising in how many respects the picture presented by the three cross-sectional surveys available to them, viz. the PSLSD data set (for 1993), the October 1994 Household Survey and the October 1995 Household Survey, is congruent. Not only are the estimates of unemployment in broadly similar ranges, but the patterns of unemployment, particular in its racial and locational breakdown are very similar. This is despite the fact that each of the surveys was run according

to a different methodology and the definitions of unemployment used were somewhat different. Indeed, the PSLSD definition of ‘strict’ unemployment was more in line with the international norms as recommended by the ILO investigators.

These similarities suggest that the results obtained from the cross-sectional surveys are reasonably robust. There seems little room for doubt that South Africa’s unemployment problem is truly enormous. Indeed, even the authors of the ILO report concede that

There is no reason to doubt that it [i.e. unemployment] does represent a serious problem and a major challenge for labour market and economic policy. (Standing et al. 1996, p.106).

The evidence that we will produce below will corroborate Klasen and Woolard’s point about the congruence of the survey evidence. Hopefully by pointing out some of the underlying dynamics, it will also help to unpick some of the puzzles that prompted the debate.

### **3 Methodology**

Empirical analyses based on the search approach have tended to use duration data to estimate the rates at which individuals move into and out of unemployment (see the studies reviewed in Devine and Kiefer 1991). Since we do not have this kind of data available, we will approach this issue in an indirect way.

We estimate the proportion of a particular age cohort that falls into one of four “states”: being employed, being unemployed and searching for work, being unemployed and not searching for work and not being economically active. We then *interpret* the changes in these “levels” between age cohorts

as reflecting the underlying net flows. Clearly this is not altogether unproblematic. The transitions between age cohorts are reflective of intertemporal transitions only if the overall system is in equilibrium. Given that our data is for the period 1993-1995, there is no presumption that the labour market was in any long-run equilibrium. Nevertheless the relative stability of the patterns over the three cross-sections (as shown below) and indeed subsequent work on patterns in the year 2000 (Collinson and Wittenberg 2001) suggest that even if there are some shifts over time, these are smaller than the “flows” that we document. We can therefore be reasonably confident about the overall direction of the changes, but perhaps less so about the magnitudes.

In light of this we content ourselves largely with a graphical analysis. This is sufficient to pinpoint the key turning points and broad trends in the data. More precisely, we present estimates of the functions

$$p_{1i} = f_1(\text{age}_i|x_i), p_{2i} = f_2(\text{age}_i|x_i), p_{3i} = f_3(\text{age}_i|x_i), p_{4i} = f_4(\text{age}_i|x_i)$$

where  $p_1$  is the proportion of people employed,  $p_2$  is the proportion unemployed and searching,  $p_3$  is the proportion unemployed and not searching and  $p_4$  is the proportion not economically active. The vector of controlling variables  $x_i$  is generally limited to race and gender. The reason for this parsimonious specification is that we estimate the functions  $f_1 \dots f_4$  non-parametrically and matters soon become intractable if the categories within which we estimate the relationship multiply.

INSERT FIGURE 2 ABOUT HERE

In Figure 2 we have presented an example of the procedure. We have plotted the proportion (on the y axis) of each age cohort (on the x axis) that

is unemployed and searching for work among African males. It is clear that this scatter sketches out a curve of sort, but one that is certainly not a straight line, nor any simple polynomial. We estimate this underlying curve by lowess (see Cleveland 1994, Deaton 1997). This estimated curve is indicated by a solid line. The basic idea of lowess is that the value of the function  $f_2$  at any point is estimated from points “near” it. The concept of “nearness” is derived from the bandwidth, which is chosen by the investigator. Within the window defined by the bandwidth a linear regression is run. Points near the middle of the window receive more weight than points towards the edge. We have used Cleveland’s tricube weighting function for this purpose.

Like with other nonparametric regression techniques (Härdle 1990, Pagan and Ullah 1999) the key tradeoff is bias versus variance. “Undersmoothing” the scatterplot (e.g. by just taking the raw proportions as our estimate of  $f_2$ ) will result in unbiased estimates, but with a high variance. Essentially we introduce a lot of noise into our estimates. We get bumps and dips in the graph which are pure statistical artefacts and do not reflect the underlying process. “Oversmoothing” (e.g. by selecting an overly large bandwidth) leads to much smoother and less variable estimates, but introduces the possibility of systematic bias. It can be shown that bias will be largest where the underlying function has the tighest curvature. This is evident in Figure 2, where our estimates somewhat smooth over the “spike” at age 27.

The resulting graph gives information about the changing *levels* of employment or unemployment. Its slope provides an estimate of the underlying *flow rate*.

In summary, our procedure involves the following steps:

1. We divide individuals into four labour market states: the employed, the unemployed but searching (i.e. unemployed on the strict definition),

the unemployed who are not searching, and the not economically active. In the case of the October Household Surveys, we have simply taken the CSS definitions of the four categories, i.e. we have not tried to make the sort of adjustments that Klasen and Woolard attempted. In the case of the PSLSD, we have followed the generally accepted procedure and classified those as unemployed on the expanded definition who gave as reason for not searching that ‘there are no jobs available’.

2. We estimate each of the functions  $f_1 \dots f_4$  nonparametrically, by means of lowess.
3. Although the resulting graphs are for a cross-section, we interpret them as giving an approximate picture of the changing stocks of an age cohort over time. The slope of the graph would therefore depict the net flows over a year.

It is perhaps worthwhile to comment briefly on how this paper differs from other contributions in the South African literature. Firstly, because we are interested in the flows of an entire age cohort, we will consider also the not economically active. From the perspective of Figure 1 it is quite clear why this is necessary, but the more traditional concern in the South African literature has been to analyse the unemployment rate, i.e. to consider only the employed and the unemployed. We will show below that one gets new insights by adopting our perspective.

Secondly, all other contributions that we are aware of are either purely descriptive (e.g. present estimates of the unemployment rate) or model the relationships parametrically. Using a nonparametric approach is intermediate between these two. It enables us to describe the underlying changes in slope without imposing these through an *a priori* choice of functional form. For

instance, Fallon and Lucas model the unemployment rate by a quadratic in age. On the basis of this they argue

A turning point is reached among Black groups at a later stage in life when the probability once again starts to rise. South Africa thus has broadly the same unemployment/age relationship as found in other countries, higher unemployment probabilities among the young and old than among central age groups. (Fallon and Lucas 1998, p.20)

Whether or not such a turning point exists, is an open question. Indeed, our nonparametric analysis (in Figure 6) throws considerable doubt on it. Of course the imposition of a quadratic relationship compels the regression function to have one, and only one turning point.

There is of course a considerable cost to adopting the nonparametric approach. It severely limits the number of controlling variables that we can employ. Furthermore we have only limited power to test hypotheses.

We accept these drawbacks, because we feel the advantages outweigh them: the approach enables the data to suggest relationships and explanations which might otherwise not occur to the analyst. We view the material presented here as preparation for a more careful parametric analysis.

## 4 Describing labour market transitions

The validity and usefulness of the nonparametric approach must be tested against what it reveals about unemployment in our data sets. In Figures 3 and 4 we have presented plots for each of the three large-scale household surveys of the proportions of each age cohort that is employed, unemployed on the strict definition, unemployed on the expanded definition only and

not economically active. We have generated the plots by race group and separately for men and women. In each case we have provided both the raw scatter and indicated the lowess estimate of the regression function.

INSERT FIGURES 3 AND 4 ABOUT HERE

The first point to note is that the lowess procedure seems to do a reasonable job of representing the underlying proportions. The second point, is that if we concentrate on the regression lines, the three surveys present an astonishingly consistent picture about the patterns of labour market participation and unemployment. There are some interesting differences (notably in the levels of ‘strict’ unemployment versus ‘expanded’ only) but overall the three surveys seem to tell very similar sorts of stories.

#### 4.1 Looking at the “levels”

If we consider the employment graphs first (the top graphs in Figures 3 and 4), it is clear that there are important racial and gender differences in the employment trajectory. The percentage of people employed in each age category is consistently higher among Whites than it is among other groups. Furthermore for each race group, the proportion of men that are employed is higher for each age group than is the case for women.

If we focus on the African population group (the solid line in the diagrams), some striking patterns emerge. The first is that the transition *into* the workforce is much slower than it is the case for any of the other race groups. Whereas almost 100% of all White men are in employment by age 25, this figure is still below 50% in the case of Africans. At its peak (after age 30), only about 70% of all African men find employment. This level of

employment is fairly stable until about 50, when it starts to drop off, more or less at the same rates as is the case for other race groups. In the case of African women, the employment level peaks at just under 50% of all African women at an age of about 40.

The pattern of strict unemployment, i.e. unemployment with job search is also revealing. For each race group the maximum level is reached some time in the twenties. In the case of Whites, Coloureds and Indians this peak is in the very early twenties. In the case of Africans, however, it is at about age 26 or 27. Furthermore, the 'height' of this peak varies from group to group. In the case of Whites, it is only about 5%. The peak for Indians is higher, but not as high as in the case of Coloureds or Africans. The level of maximum unemployment with job search differs between the surveys. In the 1995 OHS and the PSLSD it is at or just below 15%, while in the 1994 OHS it is higher at about 20%.

Clearly the rise in strict unemployment in the late teens and early twenties is associated with people leaving the school system and entering the labour market. Comparing the employment, the strict unemployment and the not economically active graph (to be considered in more detail below), it is evident that young Africans tend to leave the school system much later than their White, Indian and Coloured peers. This explains the later peak in the strict unemployment trajectory. The fact that they find it more difficult to find jobs, accounts for the fact that the maximal unemployment rate is higher than among Whites, for example.

After the peak in the distribution the proportion of strictly unemployed drops. What is quite striking about this, however, is that the distribution does not drop to zero all that quickly. Indeed about 10% of African 35 year olds are still searching for jobs. A closer examination of Figure 2 seems to



indicate that there is also a change in slope at about age 45. At this stage the level of unemployment with search seems to stabilise. It is only after age 55 that the numbers of unemployed drop to zero.

## 4.2 Looking at changes in the “flows”

The “stylised” picture emerging from the unemployment graphs in Figures 3 and 4 (and presented perhaps more clearly in Figure 2) is one in which there is a build-up in the stock of the African unemployed, due to a difference in the flows out of the schooling system and the flows into work. The turning point in this relationship is reached when the flows out of the schooling system are smaller than the flows into work (or the flows back into being not economically active).

We see a considerable asymmetry in the flows either side of the peak: the influx of people into unemployment is considerably more rapid than the outflow. Part of the reason for this is evident by considering the employment graphs (top row) in Figures 3 and 4. The rate of absorption of people into jobs slows appreciably after around age thirty. It looks very much as though the probability of an unemployed thirty year old finding work is much lower than the probability of an unemployed twenty-five year old. The reason for this could be stigmatisation, i.e. that potential employers assume that unemployment at age thirty is a signal of bad quality. Alternatively, it could be due to the erosion of skills necessary for employment.

The peak of the employment graphs is reached at about age forty. This raises a small puzzle for the unemployment graphs: we would expect the proportion of unemployed to either stabilise or to go up after this age. As noted previously, this does not happen. Instead, the strict unemployment rate continues to decline (admittedly quite gradually) and the stock of the unem-

employed correspondingly falls. Since these people are not entering the work place, they perforce must become either “discouraged workseekers” (i.e. expanded unemployed) or become not economically active. It is clear from the graphs that the numbers of “discouraged” unemployed is also falling, so we conclude that they must cease to be economically active. Indeed, a close examination of the bottom set of graphs in Figure 3 indicates that the numbers of not economically active men increases after age forty. To show this more clearly, we have magnified one of the series in Figure 5. It is interesting to note quite how sharply the proportion of not economically active individuals increases for African men in their forties. This lends support to our argument that the category of the “not economically active” needs to be included in the analysis. It appears that at least some “discouraged” workseekers might end up dropping out of the labour force altogether.

INSERT FIGURE 5 ABOUT HERE

Concentrating only on the unemployment rate produces quite a different picture. We present nonparametric estimates of both the strict and broad concepts of the unemployment rate for African men in Figure 6. In the first place it is interesting to note that the unemployment rate seems to be monotonically decreasing. The reason for this (despite the build-up in the levels in the early twenties) is that the growth in employment is faster than the growth in unemployment. We do, however, notice the relative stabilisation of the unemployment rate for men in the forties and fifties.

INSERT FIGURE 6 ABOUT HERE

This suggests that there are two very different types of unemployment problem among men: on the one hand there is a very acute, traumatic, but possibly transitory period of unemployment of young men. On the other hand, however, there is a body of older men with possibly much longer term unemployment problems. Indeed the employment graphs in Figure 3 suggest that labour absorption among African men is only about 70% of an age cohort, at the maximum. The situation for women is, of course, worse.

### 4.3 Long term unemployment

Implicit in this discussion has been the assumption that the unemployed tend to stay unemployed. Another possibility, of course, might be that there is turnover in the labour force, with most people experiencing some spells of unemployment. These two forms of unemployment would have very different distributional implications. This question can also be explored by means of the October Household surveys. In Figure 7 we have shown the proportion of people who are strictly unemployed in each age group that have been unemployed for various lengths of time. It is again interesting to note that the broad patterns are quite similar in the 1994 and the 1995 OHS. In each case nearly 80% of the strictly unemployed at age 30 have been unemployed for at least a year. In the case of the 1995 OHS we can even track much longer periods of unemployment. It is quite striking that about half of the strictly unemployed at age 30 have been unemployed for longer than three years<sup>3</sup>. This evidence, together with the fact often noted that most of the unemployed have never held down a job, suggests that the unemployment we have noted in the over 40 age group is, indeed, very long term unemployment.

<sup>3</sup>It is not possible to show this for 1994, since the categories used in 1994 were slightly different. We have amalgamated the appropriate categories to ensure that the graphs are comparable.

The unemployment graphs therefore suggest that there is a ‘core’ of about 10% of the age cohort that will essentially never find a job, but will still be undertaking active search activities for employment.

INSERT FIGURE 7 ABOUT HERE

#### 4.4 Searching and not searching

Given that the absorption rate of unemployed thirty year olds into employment is rather low and given the pattern of long term unemployment shown above, one might expect that a portion of the ‘strictly’ unemployed would become discouraged work seekers. We would therefore expect the proportion of those who are unemployed and not actively searching for work to increase with age.

One of the notable features of Figures 3 and 4, however, is that the shapes of the ‘expanded unemployment only’ graphs mirror the general pattern of the ‘strict’ unemployment graphs: there is an initial increase in this form of unemployment (i.e. people without a job, who would like one, but are not actively searching) with a peak in the twenties and then a slow decline. It is of course notable that this type of unemployment is largely an African phenomenon. What is quite curious, however, is that the shape of the African ‘expanded’ unemployed graph seems almost an exactly rescaled version of the ‘strict’ graph, in virtually every case. On the basis of the visual evidence alone one might be tempted to suggest that the proportion of expanded unemployed  $u_e$  in each age cohort is simply a multiple of the proportion of strict unemployed  $u_s$ , i.e.  $u_e = ku_s$  for some constant  $k$ .

INSERT FIGURE 8 ABOUT HERE

In Figure 8 we have shown the lowess estimates of the regression function relating the proportion of those actively searching among the unemployed, i.e.  $\frac{u_s}{u_s+u_e}$  to age. For many of these graphs a horizontal straight line would not be a bad approximation. Indeed, in the case of the men it is curious that the graphs are initially definitely *upward* sloping. This might suggest that some males only become ‘serious’ about job search in their late twenties. Job search in this case might be a function of social pressure.

There is some evidence for an age-related ‘discouragement’ effect, but if it operates, it seems quite weak. Indeed, one of the interesting features of the graphs is that the proportion of the ‘unemployed’ that are actively engaged in job search hardly ever reaches above 50%. This suggests that in many cases ‘discouragement’ does not result from *personally* disappointing experiences. Rather, many individuals seem to be discouraged before they have even attempted to find a job.

The most coherent explanation for this pattern is that many job seekers rely on information from other potential applicants. If others in their social circle have had difficulty in finding jobs, they might come to the conclusion that it is not worthwhile expending energy to find work themselves. On the positive side it also suggests that people who have had a string of personal disappointments might continue to look for work if their ‘sources’ suggest to them that work might become available.

## 4.5 Dropping out of the labour market

The ‘not economically active’ graphs show up some further interesting patterns. One point, which has already been noted, is that until about age 30, the proportion of African young people who are not economically active is much higher than the equivalent proportions for the other racial groups. This

can be attributed partially to the fact that African school-goers take longer to obtain their matriculation certificate. Secondly, there may be some disguised unemployment with people who cannot obtain jobs finding other activities to occupy their time. As noted earlier there may also be some disguised unemployment among older people who are 'not economically active'.

There are some interesting contrasts between men and women. Whereas the vast majority of men is 'economically active' (i.e. employed or unemployed on one of the two definitions) from about age 30 to about age 50, the same is not true for women. In the latter case there is always a twenty to thirty percent of the age cohort that is not economically active. In the case of Indian women these proportions are consistently and markedly higher. Interestingly enough in the case of White and Coloured women, there is a noticeable 'trough' or minimum which is reached in the mid-twenties. Thereafter the number of 'not economically active' women increases steadily. The explanation must clearly be sought in the reproductive choices made by women. This interpretation gains additional support from the fact that several of the 'unemployment' graphs show secondary peaks for women in their late thirties or early forties. These seem to be women who are re-entering the labour market after their children have grown up sufficiently that they feel that they can do so. There may, at least in the case of Indian women, also be generational differences reflected in the graphs.

It can also be noted that in most of the graphs the proportion of 'not economically active' in the above 50 years categories is higher. This suggests that Whites, Indians and Coloureds tend to retire somewhat sooner than the equivalent Africans.

These graphs put the point about 'declining labour force participation rates' among African males, as noted by the ILO report into perspective. It

is clear that this decline does not occur in the thirty-plus age groups. It is largely a youth phenomenon. Because of South Africa's demographic structure (which is heavily skewed towards the youth) this has a big impact on the aggregate figures. Far from being implausible and an indication of unenumerated economic activities, as suggested by the ILO report, it seems that the declining labour force participation rate just as the high aggregate unemployment rate, is generated by the particular ways in which *young* people relate to the labour market.

## 5 Who are the unemployed?

The descriptions given above have already indicated some of the key characteristics of the unemployed: there are significant racial, gender and age effects. The unemployed tend to be largely African and young. Women have higher unemployment rates simply because the employment rates are lower, i.e. a similar percentage of each age cohort that is unemployed when expressed as a percentage of a smaller economically active population will give much higher unemployment rates.

Because unemployment is concentrated largely in the African population group, we will concentrate on the African unemployed in the remainder of this paper. This is not to belittle the unemployment problems in other communities (especially the Coloured community).

### 5.1 Urban versus rural

Previous studies have shown that unemployment and employment status is related to location. In Figure 9 we have graphed the proportion of the age cohort of African males in each of the four states for the 1995 October Household Survey, disaggregated by urban and rural. We have done the

same in the case of African women in Figure 10. In each case people living in the urban areas show much higher levels of labour market participation, if this is measured by employment and strict unemployment only. Urban people have *both* higher employment levels and higher unemployment levels! Many more rural people are unemployed on the expanded definition only, or are not economically active. In the case of women the urban-rural ‘gap’ in employment levels and in the level of those not economically active is, in fact, quite striking.

INSERT FIGURES 9 AND 10 ABOUT HERE

Similar results can be obtained in the case of the 1994 OHS and the 1993 PSLDS, although there are some differences in the overall *levels* of (for example) the numbers of the ‘strictly unemployed’. *Within* surveys, however, the qualitative picture is similar, with the proportions of the strictly unemployed in the urban areas (for example) always exceeding those for the rural areas.

## 5.2 The role of education

It would be expected that there should be a relationship between education and employment/unemployment. Indeed popular explanations of unemployment posit that it is due to the lack of skills or education of the unemployed. Some studies have, indeed, found a relationship, although the relationship turns out to be counterintuitive: people with some (but incomplete) education seem to have a *higher* unemployment rate than people with no education at all (StatsSA 1998, Chapter 3, Figure 8). In a previous study we argued that in fact there was *no* relationship between education and the probability of employment until the post-matric level (Wittenberg and Pearce 1996).



## INSERT FIGURE 11 ABOUT HERE

In Figure 11 we have graphed the proportion of the *economically active* population that is working, unemployed on the strict definition or on the expanded definition only against years of education completed (for people aged 15 to 70). We have excluded the ‘not economically active’ category, since large proportions of people with secondary education uncompleted are still in the education sector and thus not economically active. This skews the comparisons that we wish to make.

Several features are striking about the diagram. In the first place, the graph of the people working is essentially flat (perhaps even downwardly sloping) in all surveys until twelve years of schooling have been attained. Then it increases very rapidly to around 100% with postmatric diplomas (coded as 14 years of education) or a degree (15 years). This pattern holds for both men and women, with one big difference: the level of the flat stretch is much lower in the case of women.

The graphs for strict unemployment are also interesting: while there is considerable variation in the levels between surveys, in most cases there is a noticeable upward trend until 12 years of schooling has been reached, i.e. more unemployed people with matric will be engaged in search activity than unemployed people without matric.

One problem with Figure 11 is that we might be confounding cohort effects with education effects. Younger South Africans generally have better education than older ones. We may therefore be comparing old people with jobs and low education with young better educated, yet unemployed individuals. The analysis might therefore be picking up differences in labour market conditions at the time of entry.

In order to deal with this, we have graphed the relationship between education and labour market status within a series of age cohorts: those thirty years and younger, those between thirty and forty years, those between forty and fifty years and those older than fifty. The results with the data from the 1995 OHS are shown in Figure 12. The cohort effect is visible, in that the proportion of older people working is higher for both men and women. Nevertheless within these broad age categories education (below) matric does not seem to significantly improve the probability of working. The only exception to this rule seems to be among older women.

INSERT FIGURE 12 ABOUT HERE

One interaction effect is, however, noticeable. It seems to be mainly among the young that the better educated unemployed exhibit a higher propensity to search.

## **6 Employee search and screening costs**

The relative lack of importance of education (below matric) in determining access to employment suggests that education is probably not one of the major screening devices for unskilled and semi-skilled jobs. Related work (Wittenberg 1999, Wittenberg 2001) suggests that “contacts” may be very important for obtaining access to jobs. Indeed, the importance of “contacts” as a method of recruitment in South Africa has been noted by the ILO:

In recruiting production workers, most firms use informal methods. Thus, as their main method of recruitment, 41.4 per cent relied on friends and relatives of existing workers; 26.2 per cent

used advertisements; 12.6 per cent called on former workers (1.3 per cent of which was because this was specified in the collective agreement; 0.3 per cent from “union’s retrenchment lists”), 7.3 per cent came from direct applicants, at the factory gate; 0.3 per cent came from the “group’s data base”. (Standing et al. 1996, p.323)

There are arguably two features of the South African matric qualification which decrease its value as a screening device and increase the importance of networks. Firstly, the quality of the matric is likely to be highly variable between individuals. This is not only because the educational systems from which different candidates have come is highly variable, but also because the quality within a particular system would have changed significantly over time (Fedderke, Luiz and de Kadt 1998). Since potential employers would only be imperfectly informed about the meaning of the matric under consideration, its value as a signalling device would be correspondingly diminished.

Secondly, in a situation in which large numbers of the unemployed all possess the matric, its utility as a potential sorting device for an employer is reduced. Indeed, in a situation in which potential employers become swamped with applicants virtually *any* formal method of screening applicants becomes problematic. An incident from the University of Cape Town exemplifies this problem:

More than 39 000 people have responded to UCT’s advertisement for gardeners and cleaners.

... It was worked out that if, for example, each application received five minutes of attention - it would take a staff member two working years to work through them.

Therefore it was decided that the names of 200 applicants would be drawn and then interviewed for the posts.

“This in itself has been a substantial exercise which has taken two selection committees three whole days,” said Ms Fish [UCT’s Deputy Registrar, Human Resources - MW].

The process of drawing names was overseen by an auditor, a representative of the Equal Opportunity Office and by representatives of NEHAWU, the Staff Association and management. (UCT 1997)

What the article does not state is that there were at most twenty jobs involved (private communication, Ms H. Zille) Not many employers would be willing to bear these kinds of costs in order to ensure that insider networks do not determine the job allocation process.

A “search” perspective here is again useful. As noted earlier, in the Pissarides framework the rate of job creation depends *inter alia* on

- the search and screening costs of finding suitable applicants
- the expected productivity of a match
- the expected duration of the match
- the separation costs

Operating through networks is arguably one way in which firms may reduce both the search and screening costs, as well as improve the expected productivity of the filled job. The latter would be the case particularly if existing workers are expected to “induct” new hires into the culture of the workplace and help them to acquire job specific skills.

Given the volatility of the economic climate in the 1990s, due to political uncertainty (particularly about labour legislation) and the opening up of the South African economy, the expected duration of the match and the separation costs would all have prompted employers to be particularly cautious. “Insider hiring” would have been one way in which these developments may have been off-set.

Clearly whether or not this is the appropriate interpretation of our findings on education is an issue which requires further work.

## 7 Conclusion

In this article we have argued that the application of a search approach to South African unemployment is likely to be fruitful. This would involve exploring labour market flows as much as the levels. We have taken several steps in that direction by focusing on the inter-cohort changes in labour market states. Several insights emerge from that analysis. Firstly we have suggested that the most acute form of unemployment is the large “spike” of unemployed African youth in their late twenties. This spike does eventually erode, in two directions: many will eventually be absorbed into the labour market, while others will become discouraged and even cease to be economically active. This suggests that there may be considerable hidden unemployment among people categorised as not economically active. Secondly there seems to be a problem of long term unemployment and insufficient labour absorption. At maximum only 70% of any age cohort of African men are in employment, compared to almost 100% in the case of prime age White and 90% in the case of Indian men. We have noted that there also seems to be a definite urban-rural dimension to these labour market flows. Finally, we have suggested that the education system does not provide sufficiently

strong signals for potential employers, i.e. it does not appropriately lower employer screening costs. Consequently the way in which employers search for unskilled and semi-skilled workers may lead to an insider-outsider division within the labour market.

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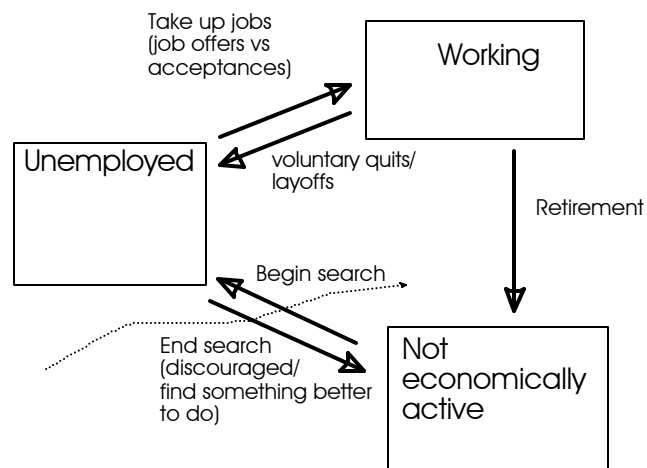
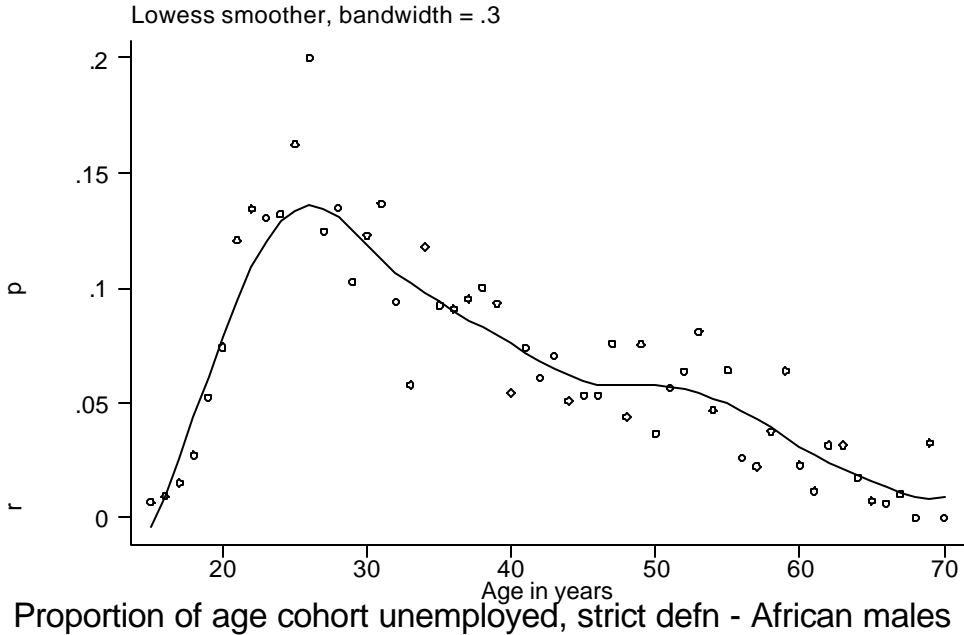


Figure 1: Some key labour market flows.



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Figure 2: Lowess is a localised smoothing technique in that it ‘fits’ a line to the data portion by portion. On the whole it tracks the underlying data very well. It tends to perform worst where the underlying function exhibits very high curvature, as happens at the “spike” at around 27 years.

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# Labour market status of men in the 1995 OHS, 1994 OHS and 1993 PSLSD

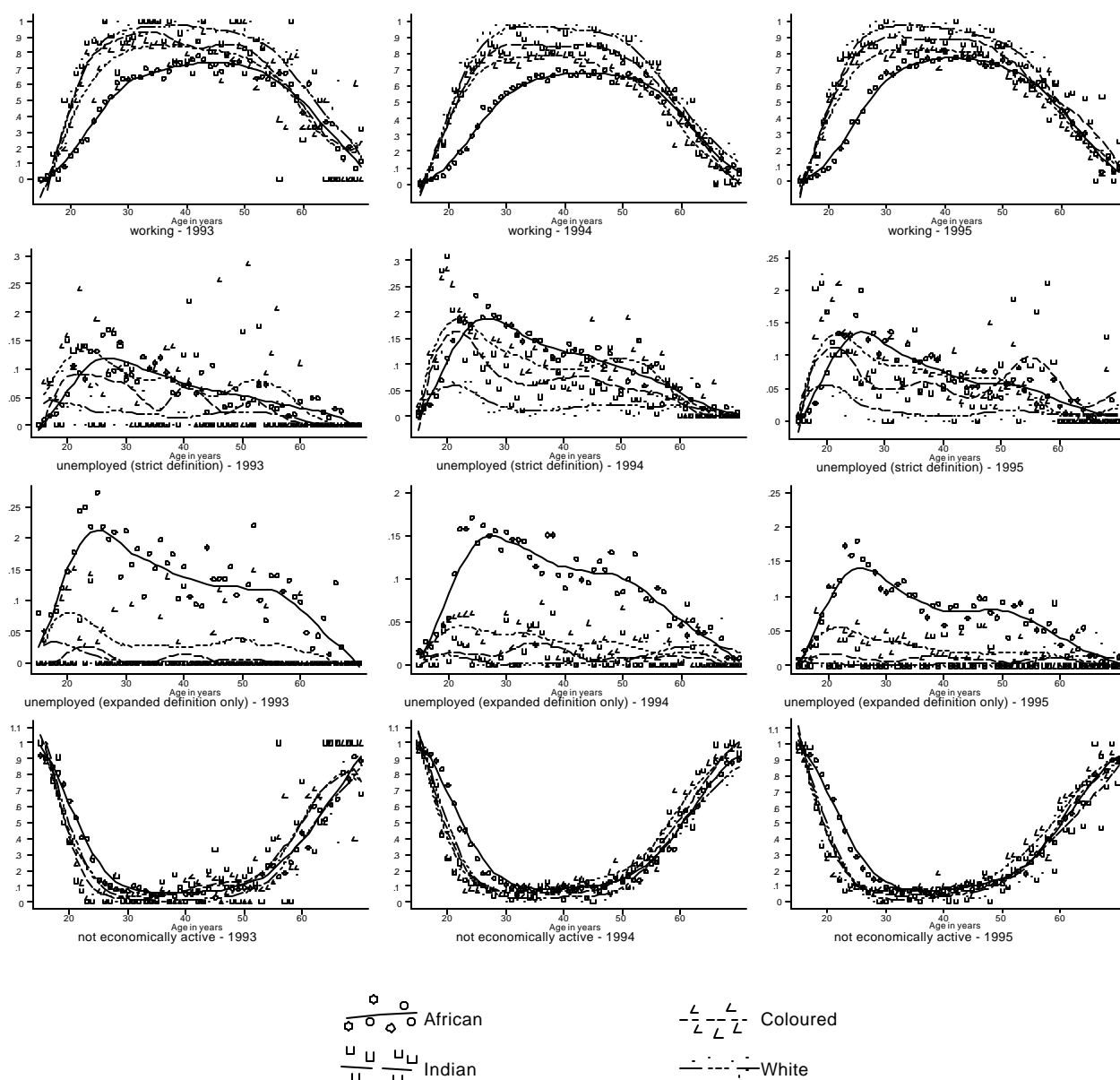


Figure 3: There are noticeable differences between men from different race groups in their experiences of employment and unemployment. These differences are portrayed in remarkably similar ways in the three surveys.

## Labour market status of women in the 1995 OHS, 1994 OHS and 1993 PSLSD

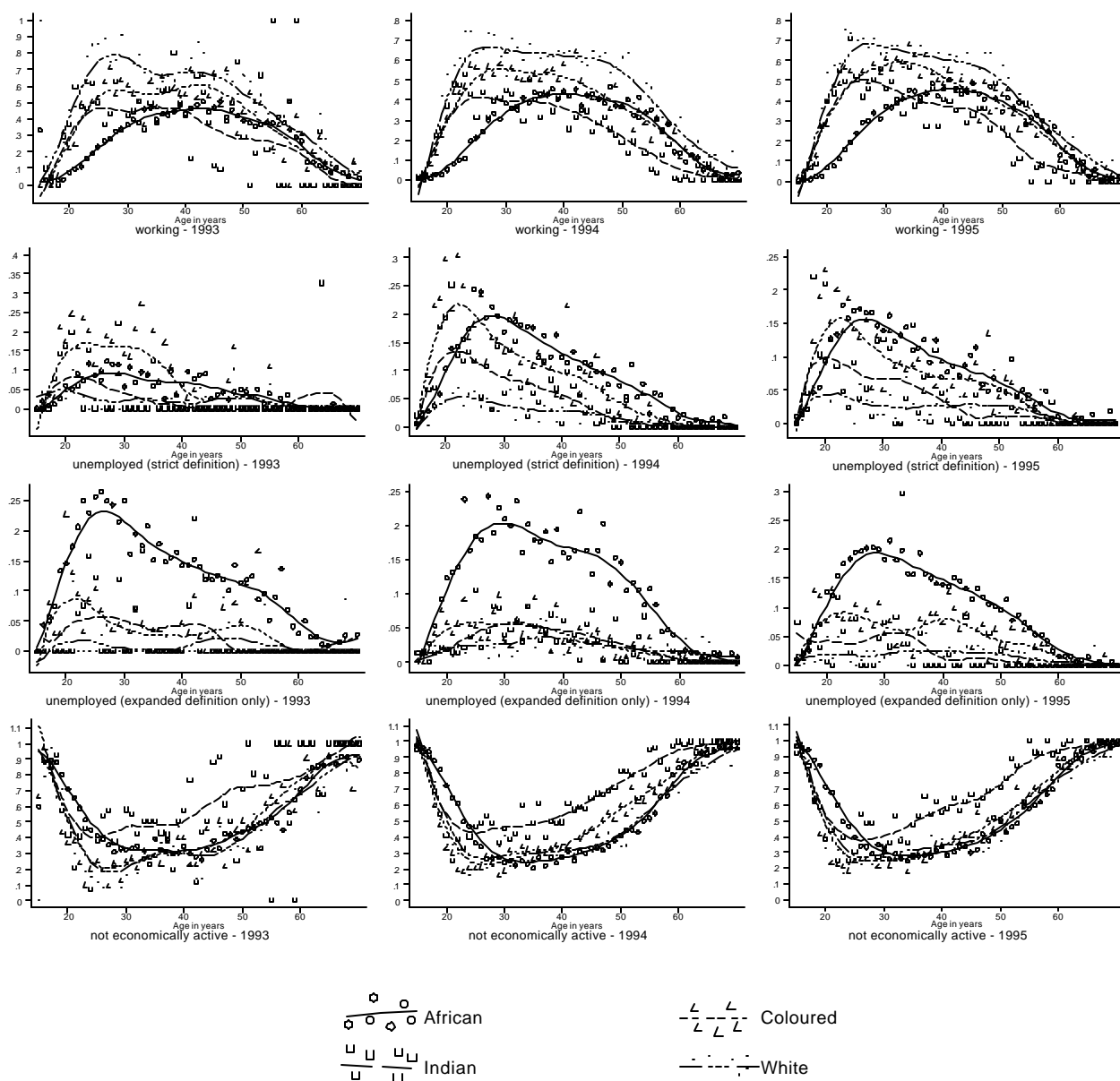


Figure 4: Women show lower labour force participation rates than men. Indian women show much lower rates than is the case for other women. The patterns of work and unemployment are again similar across the surveys.

Proportion of African men not economically active by age - detail from graph for 1995

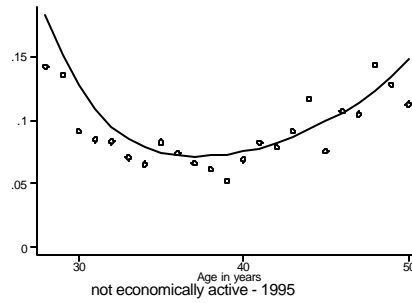


Figure 5: There is a steady increase in the proportion of people not economically active after age 40



Figure 6: Lowess estimates of the unemployment rate of African men on both the narrow and the broad definition of unemployment. The unemployment rate decreases monotonically with age between age 20 and age 60 in all three surveys.

Period of job search among the African unemployed (strict definition)

Men



M. Wittenberg 14 October 1998

Women



○ Less than 1 month  
□ 6 months-1 year

— Less than 1 month - 6 months  
— More than 1 year  
..... More than 3 years

Figure 7: Most of the unemployed on the 'strict' definition have been unemployed for over a year. Many claim to have been unemployed for longer than three years.

# Search behaviour among the unemployed

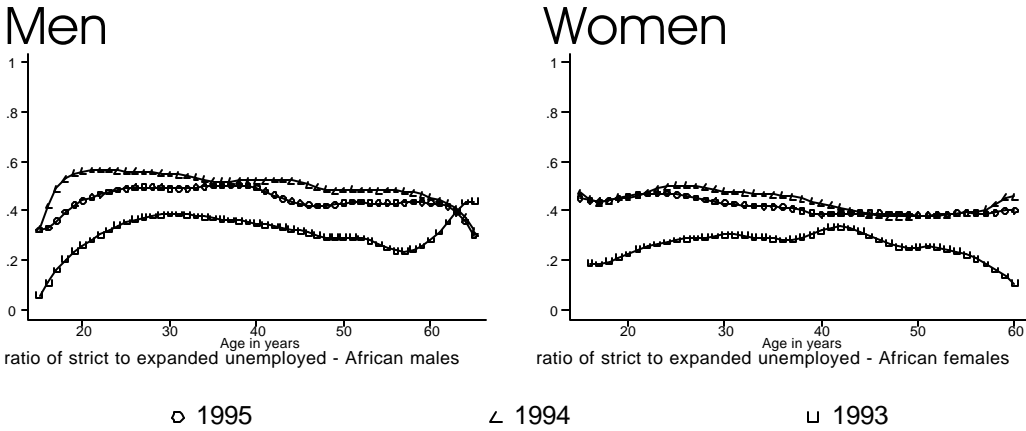


Figure 8: The proportion of unemployed who claim to be actively searching for work stays remarkably constant with age.

### Labour market status of African Males in the 1995 OHS: urban vs rural areas

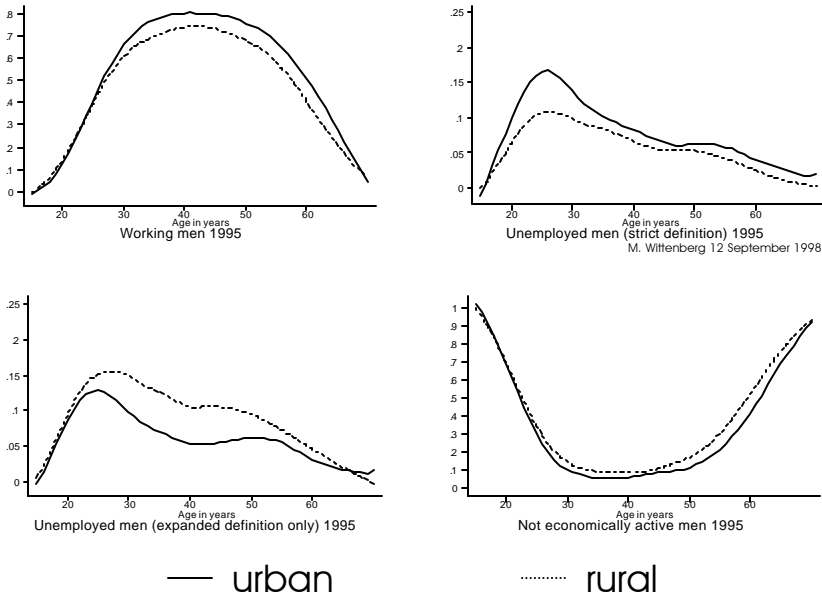


Figure 9: The proportions of men working or searching for work is higher in the urban areas. The proportions of not economically active men is higher in the rural areas.



Labour market status of African Females  
in the 1995 OHS: urban vs rural areas

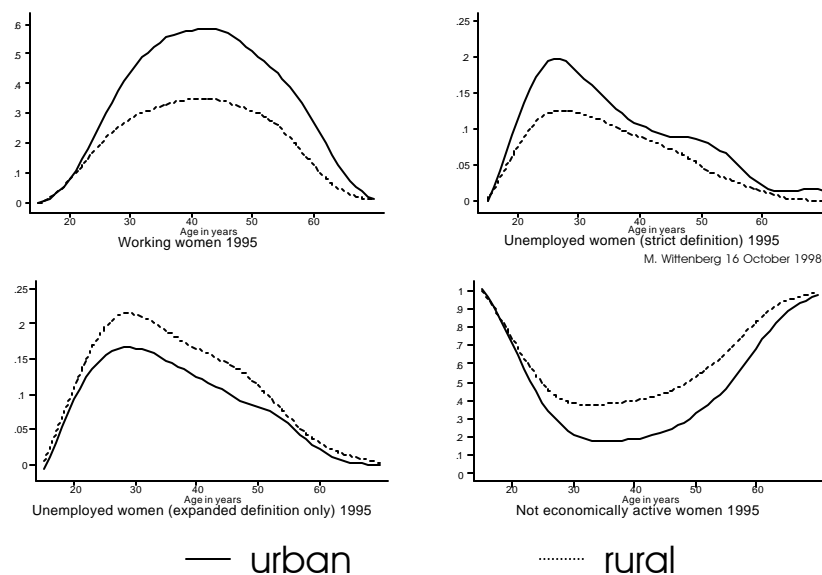


Figure 10: As in the case of men there are more employed and strictly un-employed women in urban areas. The employment gap is, however, much larger. Similarly the difference in the proportion not economically active is also much larger.

Impact of education on labour market status among economically active African men and women, 1995, 1994 and 1993

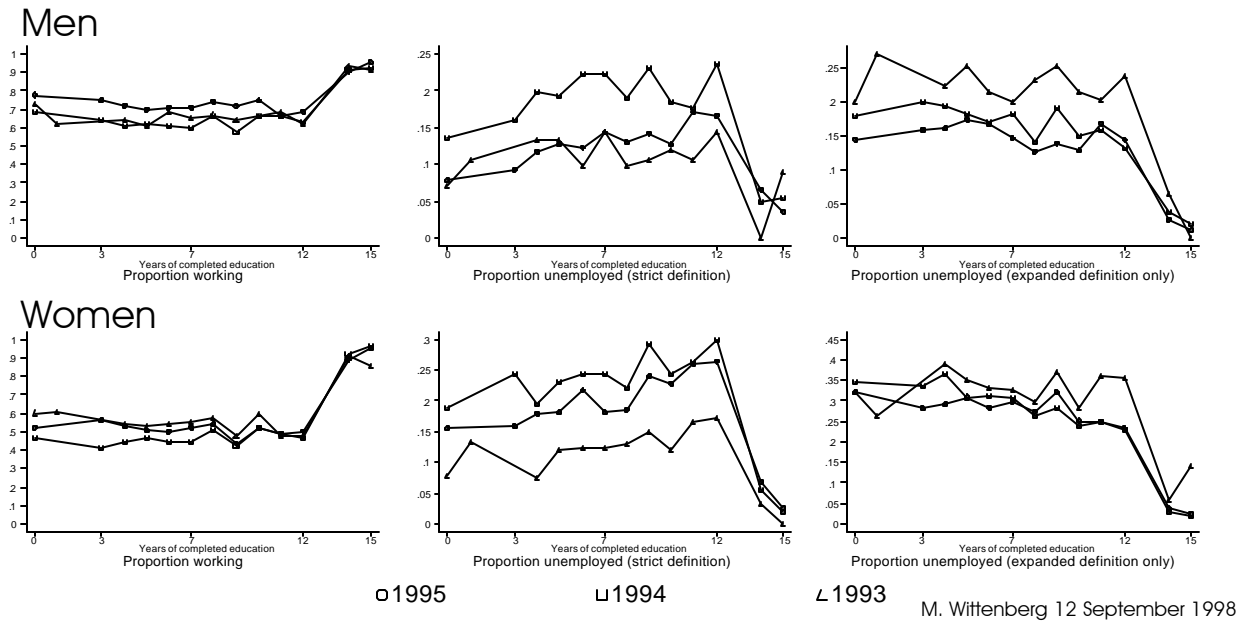


Figure 11: Education seems to make little difference to the prospect of finding employment up to matric. It does, however, increase the intensity of search behaviour.

Impact of education on labour market status, controlling for age among economically active Africans in the 1995 OHS

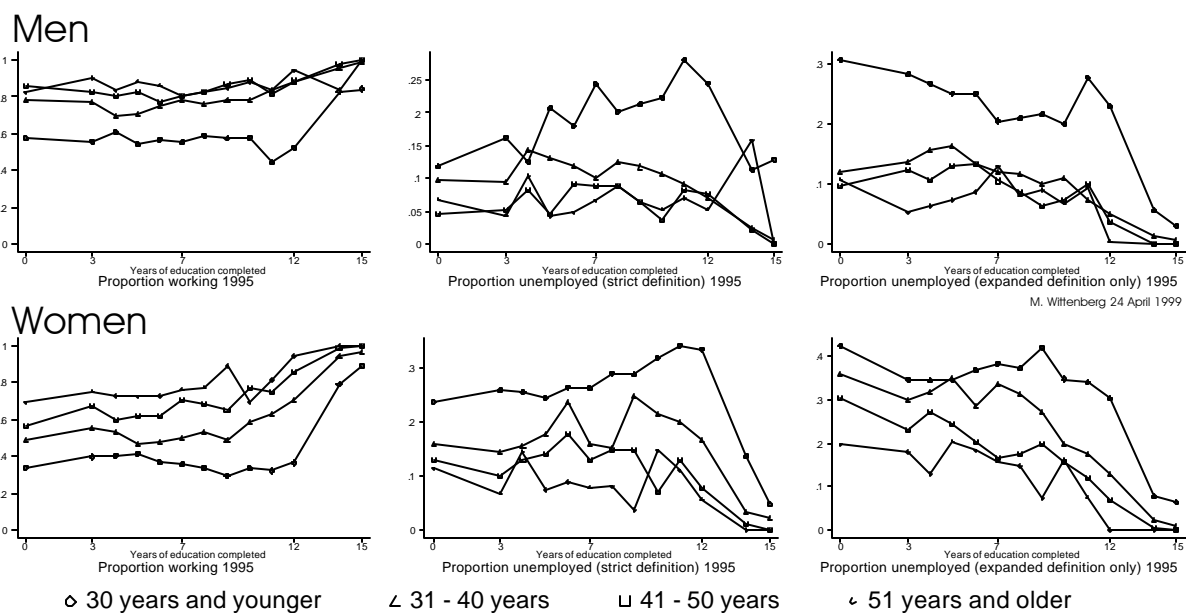


Figure 12: Increasing education up to matric does not increase the probability of working among men, even within age groups. In the case of women the probability increases somewhat among women older than forty.