Unemployment and labour force participation in South Africa: A focus on the supply-side

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ABSTRACT: We provide an analytical framework for explaining how individuals without jobs end up in different labour market states. We extend a simple search model to explain why some unemployed individuals choose to search and others choose not to search. We use this descriptive model to identify factors that could influence an individual's rational decision to be in a particular labour market state. It further highlights the idea of different degrees of labour force attachment. Different degrees of labour force attachment may imply both different intensities of searching and different degrees of responsiveness to given changes in the labour market environment.

1 Introduction

In this paper, we provide an analytical framework for explaining how individuals without jobs end up in different labour market states. The focus on modelling decisions on the supply side of the labour market is informed by and contributes to the debate about appropriate definitions of unemployment in South Africa.[1]

The debate is interesting because official unemployment statistics currently exclude the non-searching unemployed (in line with recommendations by the International Labour Organisation). Only those without jobs, who want a job and who have been searching for 4 weeks prior to their interview are classified as narrowly (and thus officially) unemployed, based on the October Household Surveys. The group of individuals who want jobs but have not been searching are not part of this narrow definition, and are only unemployed on the broad (or expanded) definition. The decision to count searchers only as the narrowly unemployed effectively reduces the labour force participation rate (as measured by all those employed and unemployed) and the unemployment rate - and the magnitude of these differences is not small.[2] In this paper, we argue that non-searchers can be thought of as the 'hidden unemployed', as they are likely to respond to positive changes in the labour market by starting to search.

We take up a line of argument set out by Jones and Riddell (1999) that search is a continuous or graded activity and that the idea of labour force attachment is more useful for thinking about the experience of unemployment. Different degrees of labour force attachment may imply both different intensities of searching and different degrees of responsiveness to given changes in the labour market environment.

The paper proceeds as follows: section 1 sets out a simple search model which explains why some individuals choose to search and other choose to not search. The model is extended to take account of the behaviour of non-searchers and considers why different search intensities are possible choices for those without jobs. It is also used to show how changes in labour market conditions can explain movements between measured labour market states. Section 2 describes the two data sets we use: the October Household Surveys 1997 and 1999, and provides basic unemployment figures for each year. It

[1] See Kingdon & Knight (2000) and Klasen and Woolard (1999) regarding this debate

[2] See Figures 2 & 3 in the appendix for differences between broad and narrow unemployment rates and broad and narrow labour force participation rates.

gives an indication that vulnerable groups identified in earlier household survey research have not changed significantly in 1997 and 1999. Average characteristics of the African working age population are also discussed within the framework of the search model. Section 3 sets out the estimation strategy we use for applying our model of choices on the supply side of the labour market to the data, and presents results. Section 4 concludes.

1.1 Analytical framework

Much of the South African literature has tried to distil insights about the supply side of the labour market from analysing rich household survey data that is available.[3] Bhorat and Leibbrandt (2001: 110) comment on the lack of theoretical framework in many of these studies.[4] Since we are interested in questions around the degree of an individual's labour force participation, we begin with a simple analytical search model of how individuals decide to optimally interact with the labour market.[5] In this model, workers choose to be in a particular labour market state as the outcome of their optimal strategy.

Assume that all potentially economically active people (i.e. adults) begin in a reservoir called not economically active (NEA), or out of the labour force. The individual's choice set is at first restricted to employment, searching unemployment, and being out of the labour force (including houseworkers, pensioners, students and others not able to have their activities classified). From the potential economically active pool, individuals make decisions which result in them either not searching or moving into searching unemployment. The goal of those actively participating within the labour market is assumed to be to find a suitable job (where suitable is defined in terms of reservation wage properties). If an individual receives a job offer, she will accept or

[3] Household surveys have been conducted in 1993 by Saldru (Project for Statistics on Living Standards and Development) and in 1994-2000 by Statistics South Africa. For some of the work done using these data sets, see Kingdon & Knight (2000), Klasen & Woolard (1999), Simkins (1996) and Wittenberg (1999).

[4] "On the conceptual level, hardly any of the South African work spells out even a rudimentary model of the South African labour market as the context for estimation" (Bhorat & Leibbrandt, 2001: 110). In this paper they are concerned with estimating wage functions in South Africa.

[5] This approach derives from literature in labour economics, where it was first used to explain the search behaviour and optimal search strategies of unemployed workers (see Devine & Kiefer, 1991 and Mortensen (1986) for reviews).

refuse based on how the offered wage compares to her reservation wage. For those individuals of working age who do not have jobs, they may choose to search for a job or to not search and so remain NEA.

How the individual decides to be in any one labour market state depends on the outcome of a comparison of value functions, which describe the (present discounted value of) expected net benefits associated with being in any one of the states.[6] These functions are set out descriptively below:

$$Vj = \text{value of taking a job offer} \tag{1}$$

$$\begin{aligned} V_{su} &= \text{value of search unemployment} \\ &= B(s) - C(s) \\ &\quad \text{where } B(s) \text{ are the benefits of search} \end{aligned} \tag{2}$$

$$\text{and } C(s) \text{ are the costs of search} \tag{3}$$

$$\begin{aligned} V_{0,i} &= \text{value of being out of the labour force in state } i \\ &= B(o,i) - C(o,i) \end{aligned} \tag{4}$$

where i could be the out of the labour force status of houseworker, student, retired individual, or other.[7]

In (1), the value of taking any job offer involves a consideration of how large the offered wage rate is above the value of searching unemployment or above the value of being out of the labour force.

In (2), the benefits of search are equal to:

$$B(s) = (P_j)(E\left[w/x\right]) + b_{su}$$

where P_j is the probability of finding a job and $E\left[w/x\right]$ is the expected wage in that job, given x, the individual's characteristics (e.g. age, gender,

[6] This approach is standard in the search literature. It is set out in detail in Pissarides (2000). Here, we provide a descriptive interpretation of what such a search model might look like.

[7] Wittenberg (1999a) suggests that the 'other' might involve criminal activities. We are thinking here of 'other' as individuals not doing anything with their time - they might also be classified the non-searching unemployed, as we discuss later.

education level, location). b_{su} is the amount of non-work income available in searching unemployment, which may include direct unemployment benefits (UIF) and transfers across or within households. It depends on what resources the household has access to.

The costs of search are equal to:

$C(s)$ = the sum of all costs associated with each search method pursued.

This includes the costs of gathering labour market information through search activities (e.g. transport costs, cost of media, opportunity cost of time spent queuing).

In (3), the benefits of being out of the labour force depend on which non-participation category the individual chooses: i = houseworker, or student, or retired, or other.

B(houseworker) = value of rearing children + value of keeping house + b_o

B(student) = value of improving qualification + b_o

B(retired) = value of leisure time + b_o

B(other) = value of leisure time + b_o

Where in each case, b_o is the value of non-work resources available to the individual, either through direct transfer (e.g. the state old age pension for those retired or the child maintenance grant for a primary caregiver) or transfers within the household (e.g. the pension shared out across individuals).

The costs of being out of the labour force are the opportunity costs of not searching for a job. This will vary depending on how the individual package of characteristics (x) is expected to fare in the job market ($E[w/x]$ *and* P_j).

In the traditional search approach, comparison of costs and benefits of accepting a job offer versus continuing search activities leads to the establishment of a reservation wage: that wage rate above which workers will accept a job offer. For our analysis, we are not primarily concerned with the decision to accept a job if it matches a worker's reservation wage property, because receiving a job offer depends on a firm-side decision (about how many jobs to offer and to whom) which interacts with the supply of labour decision of a suitably matched worker. We instead focus on what is happening among the different pools of potential workers.

Given the functions in (2) and (3) above, the search model implies that to be observed as a searching unemployed individual,

$V_{su} > V_{0,i}$

Similarly, to be out of the labour force,

$V_{0,i} > V_{su}$

This model emphasises the choice aspect of labour supply decisions from a position of joblessness. It does not say anything about whether the unemployed are without jobs voluntarily or whether the unemployed are happy or unhappy about their joblessness. Although we highlight labour market state outcomes on the supply side being the result of a rational choice process, we do not imply that this choice is unconstrained. We are not arguing that those who are out of the labour force and/or not searching for jobs have a particular taste for unemployment, and that they should not concern policy-makers. The model rests on the assumption that given the state of the labour market facing individuals at any point in time, the decision to not search or remain out of the labour force is a rational one.

Before this model can be applied to the supply side of the South African labour market, it must be noted that there is a formal distinction between searchers and two groups of non-searchers in South Africa. As indicated in the introduction, Statistics SA currently distinguishes between the unemployed who are searching, those who are unemployed and not searching (giving as their reason that there are no jobs available) and those who are out of the labour force. This is a three way slicing up of the jobless, with the middle group being described as discouraged workers.

To explain the behaviour of non-searchers, we could proceed in one of two theoretical ways. First, we might set up an alternative value function, which weighs up the benefits and costs of non-search to compare with value functions for the searchers and those out of the labour force. However, this approach is not very useful, because it requires specifying benefits of non-search (which would only include the value of leisure time and b_o, sources of non-work income) and costs of non-search. Intuitively, it is difficult to think about costs of sitting at home doing nothing (not searching, not farming, not studying, not doing housework - but 'other') other than as an opportunity cost of not being in the labour force. The form of the value function for non-searchers is therefore difficult to specify as different from those not participating.

Instead, we turn to the concepts of labour force attachment and different degrees of search intensity across those individuals who are in the labour force under the broad definition. We take labour force attachment to indicate the degree of active participation by the jobless in the labour market. This definition derives from a paper by Jones and Riddell (1999) in which they investigate the appropriate definitions of unemployment and non-participation.

They illustrate (using Canadian data) that searchers are likely to have the strongest attachment to the labour force, while non-searchers are more marginally attached although still distinct from those out of the labour force.

Jones and Riddell (1999) suggest that one way in which it may be possible to think about degrees of labour force attachment is to consider different search intensities with reference to search methods.[8] Different types of search methods may indicate different search intensities: for example, sending out job applications may be highly intensive search, while waiting at the side of the street would be low intensity search.[9] Those individuals with a high search intensity would then have a strong attachment to the labour force. In addition, those individuals whose search intensities change more rapidly when circumstances improve in the labour market can be considered more strongly attached to the labour force.

Abraham and Shimer (2001) suggest that individuals who choose to remain in the labour force in a position of unemployment for long periods of time have a higher degree of labour force attachment than those who are similarly jobless but choose to step out of the labour force. Their paper looks at increasing labour force attachment in the US 1975-85 by examining transitions of unemployed individuals (particularly women) into and out of the labour force.[10] Although we cannot test this hypothesis on South African

[8] Using data on search methods and information about transitions between labour market states in Canada, they find that the marginally-attached unemployed (which include individuals waiting for replies to job requests and individuals who are discouraged) are more similar to the searching unemployed than the NEA. Transition rates into employment for searchers and non-searchers are more closely related than for non-searchers and non-participants. Nonetheless, they find that passive and active unemployment are distinct states (Jones and Riddell, 1999: 153). Both of these findings would suggest that there is merit in counting the non-searching unemployed as part of the labour force, while maintaining the distinction between the more and less attached.

[9] The OHS questionnaires list search methods that are in line with the ILO's categorisation of activities undertaken in the recent period in order to qualify an individual as narrowly unemployed. Individuals must have: (1) waited or registered at employment agency or trade union; (2) enquired at workplaces and other possible employers; (3) placed or answered advertisements; (4) sought assistance from relatives or friends; (5) looked for land, building, or equipment or applied for permit to start their own business or farming; (6) sought or underwent training; or (7) waited at street side (Stats SA, 1997: Question 3.33 & Stats SA, 1999: Question 3.32)

[10] "Workers who have a stronger attachment to the labour force tend to stay unemployed when they lose a job, rather than dropping out of the labour force. This raises both the unemployment rate and unemployment duration." (Abraham & Shimer, 2001: 4).

data, we can use the idea in combination with different levels of search intensity to understand how non-searchers may be different from those out of the labour force.

Theoretically, we may distinguish between the non-searching unemployed group of individuals, where search intensity is at the lowest extreme of zero, and searchers, where search intensity is at the other extreme of one. We may also distinguish between the non-searchers and those out of the labour force in terms of their different degrees of labour force attachment. The stronger labour force attachment of the discouraged is observed both in the decision not to be classified as out of the labour force (i.e. to be available for work), and in the more rapid response of search intensity to changing circumstances. Thus, a non-searcher is more closely linked to the labour force than a houseworker (for example) both because the non-searcher chooses to retain the label of unemployed and because he is likely to respond with greater search intensity than the houseworker when job opportunities improve.

The pertinent question in the South African context is then: why do so many individuals choose to remain non-searching unemployed rather than (a) searching or (b) leaving the labour force? The choice of zero search intensity coupled with a stronger degree of labour force attachment is rational for these non-searchers, given the environment in which search must take place. Pissarides (2000: ch 5) incorporates into his labour market model the idea of search costs increasing with increasing search intensity. Returning to the value function (2) above, it is possible to think of both benefits of search and costs being affected by the chosen level of search intensity. More active search will only be undertaken if the increase in costs to the individual is more than outweighed by the increase in potential benefits flowing from more intensive search.

In the South African labour market, it is plausible that for many individuals, the relatively low benefits of more active search do not currently justify high degrees of search intensity. For non-searchers, P_j is low (given that they are not searching), and $E(w/x)$ is also likely to be low given their average characteristics (see Figures 4 & 5).[11] Also, since non-searchers tend to live in rural areas with few job opportunities, the costs of moving search intensity away from zero are likely to be quite high. This structure of costs and benefits causes the discouraged workers to distinguish themselves from

[11] In the next section, it is shown that non-searchers are younger, have lower education qualifications and are more likely to live in remote rural areas than searchers.

searchers and remain on the margin of being in and out of the labour force.

In our model, if the structure of costs and benefits change under changing labour market circumstances, many of the non-searchers will move away from the margin and increase their search intensities, becoming more like the searching unemployed in degree of labour force attachment. They may be identified as different from those out of the labour force if their response to these changes is stronger than the response of houseworkers, students and retired individuals.

Consider the following factors as part of equation (2), which would act to encourage higher levels of search intensity:

- P_j: the probability of being offered a job depends on the general macroeconomic climate, the sentiment of employers, as well as factors specific to the individual, like the areas in which they are searching. If this probability improves, all else constant, then the net benefits of more intensive search increase.

- $E(w/x)$: the expected wage rate depends on what sorts of wages firms are willing to offer, as well as a vector of individual characteristics: age, gender, race, skills/education, type of job and location of job. Thus, if expected wages increase with age or with education, then it is more likely that older and more educated individuals will search than younger and less educated individuals. Also, if education increases, an individual is likely to increase search intensity.

- b_{su}: an increase in the value of other income while unemployed may have a disincentive effect on search as it increases the reservation wage individuals are willing to accept. It may also facilitate increased search intensity as individuals are better able to afford costs of search.

- $C(s)$: the costs of searching depend on physical distance (from the labour market) and informational distance (access to phones, media, contacts through migrant workers). If costs of search are decreased, for example by improved information flows between employers and potential employees in rural areas, then search intensity is likely to increase and individuals may switch to being searchers from being non-searchers.

A number of insights emerge from this approach to thinking about the supply side of the labour market. Firstly, individuals will always choose to

be in a state which maximises the present discounted value of expected net benefits. Secondly, the activity of search can be distinguished from non-search in a discrete way (as the official unemployment statistics do), or in a continuous way (which we have tried to outline using the idea of search intensities). While the data prevents us from observing the continuous case, we are able to use the discrete observations to comment on (1) how different groups of people value the different labour market states and (2) how close the different groups of jobless individuals are, in terms of their characteristics and responses to changing labour market conditions. We do this in the next section.

1.2 Unemployment and labour force participation in the OHS 1997 and 1999

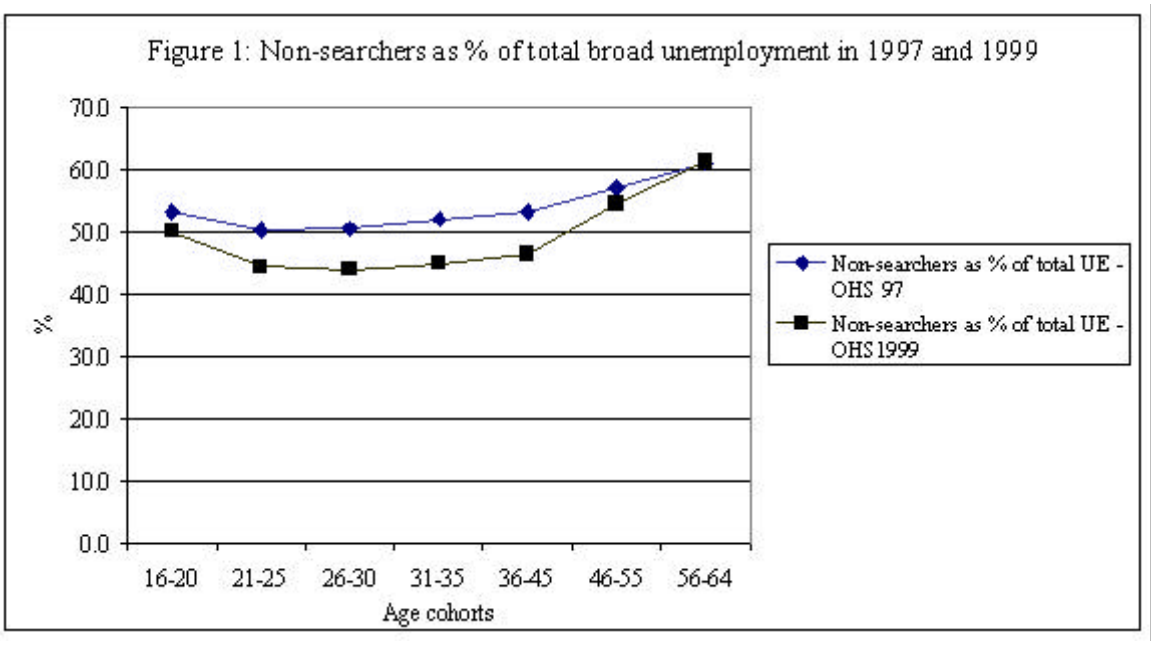
Much South African labour market analysis seeks to untangle the structure of unemployment and employment across demographic strata defined by gender, age and race, and location. Figures 2 & 3 provide unemployment rates in 1997 and 1999 for the entire population, across these different segments of the labour market. It is clear from these tables that the unemployment problem remains most severe for Africans, women, young people, and the rural population. We make only two additional points here, with respect to the impact of location and age on the labour supply decisions.

The gap between the broad and narrow unemployment rates is substantial at 14.7% in 1997 and at 12.9% in 1999. This gap widens for former rural homelands (24.4% in 1997 and 19.7% in 1999). In each year the gap is also substantially larger across the four poorest provinces: the North West, Northern Province, KwaZulu-Natal and the Eastern Cape.

Low labour force participation (LFP) rates, found especially in the former homelands and self governing territories (SGT's), are correlated with extremely high rural unemployment rates on the broad definition. Although broad labour force participation has gone up in 1999 to 50% from 43.6% in 1997, it is still extremely low compared to the national average. The dramatic concentration of high unemployment in rural former homelands and SGT's can be seen most clearly on Map 1. The map shows broad unemployment rates for each magisterial district that have been calculated using the 1996 Census.[12] Low LFP rates and high broad unemployment rates might suggest

[12]It is questionable as to whether disaggregration of the national labour market at the

Figure 1: Non-searchers as % of total broad unemployment in 1997 and 1999 (Source: Authors' calculations from OHS 1997 & 1999)



that there is widespread discouragement among the working age population, in rural areas especially.

Non-searchers as a percentage of all broadly unemployed have decreased in 1999 (see Figure 1), but the pattern of a larger proportion of non-searchers in the very young (16-20) and very old age groups (46-64) is repeated.

Both broad and narrow unemployment rates decline over age cohorts, being the largest in the 16-25 year age group. Although this cannot be interpreted as an ageing effect from a single cross section, the pattern is borne out in Wittenberg's (1999b) investigation of three consecutive cross sectional surveys. The suggestion there is that as the working age population grows older, more individuals leave the labour force through retirement or become

magisterial district level is far enough - some districts may cover more than one homogenous labour market, in which case an alternative measure of local unemployment rates is necessary. However, unemployment rates calculated by enumerator area may tend towards the other extreme of being too narrow to define a local labour market.

so discouraged from search failure that they drop out completely. Unemployment rates decline with age, possibly because the discouraged unemployed (particularly women) classify themselves as out of the labour force, and also because more individuals are being absorbed into employment once leaving the youth category.

From Figures 2 & 3, a story emerges that some sections of the population are more likely to be unemployed than employed; some sections are more likely to be non-searching than searching; and many of these sections are also less likely to be in the labour force in the first instance.

Average characteristics of individuals in different labour market categories are calculated in Figures 4 & 5. They show summary statistics for the weighted sample of working age African women and men in 1997 and 1999. These variables may be hypothesized to influence the relative costs and benefits of the value functions set out in section 1 and so impact upon the decision in which labour market state to be in on the supply side (in the absence of any job offers).

In terms of individual characteristics, age, gender, population group and education level impact on the benefits of search, through the probability of receiving a job offer, P_j and the expected wage $E[w/x]$.

From the OHS1997 and 1999, the average age of African individuals without jobs is significantly lower than the average age of the employed. Furthermore, the non-searchers are closer in age to the searching unemployed than those out of the labour force. This information, combined with increasing labour force participation rates over age cohorts (up until about mid-forties) has the interpretation that younger individuals perceive their net benefits from being out of the labour force as larger than the net benefits of searching. As they age, the probability of finding work increases and/or the expected wage rate increases, making entry into the labour force an optimal strategy. We could also read this as evidence of decreasing benefits of being out of the labour force with increasing age, i.e. the value of shared resources in the household goes down as individuals age.[13] The importance of heading one's

[13] Klasen and Woolard (2000) argue that the state old age pension to pensioners in rural areas, where it constitutes the main source of income, draws many unemployed to these rural areas. Sharing in the resources of parents, grandparents and relatives many of them do not engage in search activities and end up being non-searching unemployed in our categorisation. The link between unemployment and household formation has been investigated by Wittenberg (1999a).

own household and starting a family is also thought to increase with age.[14]

Another pattern emerges with regard to education levels over the three jobless states. When considering the proportion of individuals with secondary schooling or less, both OHS1997 and OHS1999 indicate that the searchers are more like the employed, while the non-searchers have levels of education more similar to those out of the labour force. Over 80% of all non-searching or out of the labour force men and women of working age have education less than matric. For the other two categories, this figure is just over 70%. This connects with the findings of Wittenberg (1999a: 31) that better educated individuals have a higher propensity to search. Within the framework of our model, higher levels of education induce higher search intensities, as the expected benefits of search are higher.

The impact of no previous work experience may have two reinforcing effects on the decision to not search. The longer the period of time for which an individual has never been employed, the more skills are eroded and so the lower are benefits to search. Also, if individuals have never been employed, their information about the labour market (and even information about where to access information about the labour market) may be limited. The costs of obtaining information are then likely to be much higher. It is not startling then, that more non-searchers have never worked before than searchers in both 1997 and 1999. What is interesting is that so many of the searchers (between 68% and 76% in 1997 and between 64% and 71% in 1999) have never worked before, and yet are still searching. This implies that there are some factors which work to increase the net benefits of search for this group, beyond those of the non-searchers and non labour market participants.

Some of these factors may be found by looking inside the household. The set of household characteristics include proxies for the amount of non-work resources b_{su} or b_o potentially available to searchers and those who do not search. The presence of a pensioner in the household indicates at least the sum of the state old age pension is available for consumption in the household, while the presence of a migrant indicates that remittances are likely. While intra-household transfers may increase the ability of the individual to pay for search, and allow increased search intensity (with the accompanying increase in benefits from search through increasing P_j), they

[14] Wittenberg (1999a:19) suggests 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".

are also part of the benefits of no search, and could increase the likelihood of non-searching behaviour. The effect of a larger household may be ambiguous: the more resources have to be shared, the weaker the ability of an individual to fund costly search, but the lower the benefits of not searching or remaining outside of the labour force.

Household size and the number of children under 16 (dependents) may also feed into non-market benefits from home work or from being retired. The larger the number of young children to look after, the larger the benefit to remaining out of the labour force (or, the greater the opportunity cost to the main care-giver of going out to search). This is likely to have different effects for men and women.[15]

Compared with searchers, non-searchers are seen to live in larger households, where per capita expenditure is lower and the number of children under 16 is higher. This would suggest that these people have fewer resources to fund search. However, more of these individuals and more of those out of the labour force live in households with at least one pensioner and at least one migrant. This would suggest that the non-searchers and non labour market participants have $b_o > b_{su}$.

There may be an additional reason why non-searchers living in households with migrants report a zero intensity of search, even though they report a desire for work. If migrants are able to transmit labour market information back to relatives within the household, then the optimal strategy for individuals facing high costs of search and low expected benefits is to wait for such information.[16]

Location is the final factor that has a tremendous impact on the supply-side decisions of South Africans. The area variable captures the effects of living in urban, rural, or homeland areas. Given the geographic concentration of South African economic activity, living in a rural or homeland area is likely to reduce P_j, and increase $C(s)$. Rural former homelands are presumably the most distant from centres of information about jobs, and are also lacking in communication and other community facilities. Thus the area variable probably does a good job of proxying for the notion of search costs.

In 1997 and 1999, more of the searchers are located in urban areas than in rural or former homeland areas but this pattern is strongly reversed for

[15] See Basu et al (1999) for the effect of household structure on the labour supply decision of men and women under changing labour demand conditions.

[16] Jones and Riddell (1998) identify 'wait' unemployment as an additional category of low labour force attachment.

non-searchers and those out of the labour force. Although we are unable to identify the individual's propensity to migrate between urban and rural areas in response to different valuations of the net benefits of search, we can say that at a point in time, location does matter in the decision to be a searcher, a non-searcher or a non-participant, and that it matters more for distinguishing searchers from the other two jobless categories.

Decomposition of the average features of the searchers, non-searchers and non-labour force participants using 1997 and 1999 data indicates that:

1. Searchers and non-searchers are more alike than non-searchers and non-participants in terms of age.

2. Non-searchers are closer to the non-participants with respect to education, household size and number of dependents, the presence of a pensioner or a migrant, and location.

3. Non-searchers live in households with the lowest per capita expenditures (across all labour market states)

Using our model, we interpret this as indicative of the marginal status of non-searchers: they may be out of the labour force in some circumstances but may join and actively search when these circumstances change. They constitute a pool of hidden unemployment.

1.3 Estimation Results

The above discussion suggests factors which distinguish individuals in the conventional labour market states. A multivariate analysis could confirm our interpretations. For different variations in the labour market environment or individual characteristics, we analyse changes in the likelihood of being in a particular labour market state.

A working age person's labour market status is considered as the outcome of a selection process between four distinct states: employed, unemployed and searching (narrowly unemployed), not searching but still wanting work (only the broadly unemployed), and out of the labour force.[17]We estimate

[17]Although the alternatives can be interpreted to reflect various degrees of labour force attachment they are initially not considered as being ordered. Additionally, this list is not exhaustive. There are obviously individuals who search while in employment; they do not concern us here. We are also not considering different degrees of labour force attachment in employment, e.g. casual employment, part-time and full-time employment.

the likelihood of being in one of four states separately for African women and men. Using OHS1997 data, we were also able to include the broad magisterial district unemployment rate as a measure of the P_j for individuals in local labour markets. These rates were calculated off the 1996 Census, and so served as a reasonable piece of information for individuals in 1997 to infer P_j.

Figues 6 & 7 report the respective results of the multinomial logit estimation. Using education splines in the estimation allows for different coefficients on primary, senior primary and secondary education, matric (senior certificate), and higher education.

Joint test results (not reported here) confirm that searching and non-searching individuals are distinct from people not in the labour force.[18]It is the coefficients on the regional characteristics - whether the person resides in an urban or rural area and the broad magisterial district unemployment rate - that differ markedly.

Interpretation of the coefficients is not straightforward as they describe the probability of being in each labour market state relative to the omitted category (out of the labour force), and because the signs of the coefficients can differ from the marginal effects. Tables 7 and 8 demonstrate how changes in each variable in the model affect the probability of being in a particular labour market state, holding all other characteristics constant. We calculate changes in probabilities that are attributable solely to the variation of a single characteristic. We do so by setting the variable to a fixed value for all observations (e.g. area = 0, rural), and predicting labour market states using our model and then repeating the predictions for the alternative value of the same variable (e.g. area=1, urban). The resulting changes are expressed as proportions of the baseline probability for each labour market state. The baseline predicted probability is the actual proportion of working age African men and women in each of the defined states according to the (weighted) OHS1997.

Education clearly draws people into employment, and matric (senior certificate) into labour force participation. Matric has the single largest positive effect on inducing Africans to search. Post-matric education has the second largest effect on raising employment probabilities, particularly for women. It is interesting that secondary education has the largest effect on employment

[18]We also tested whether all coefficients are equal across the two unemployment states; this was strongly rejected.

probabilities.

The direction of the effect of marriage follows the theoretical idea of serving as a signal to employers that is positive for men and negative for women. Drawing on the discussion of household formation and unemployment we cannot rule out the possibility that causality might actually run the other way - from employment to marital status.[19]

The predicted effects also confirm the idea that individuals living in households with pensioners are more likely to be jobless. Presence of a pensioner has a larger impact on the probability of being non-searching unemployed than searching or out of the labour force. We can draw similar conclusions for labour force status probabilities of African men from the presence of a migrant worker.

Considering the impact of location, men and women in urban areas are predicted to be about thirty percent more likely to be searching unemployed than in rural areas. This is in stark contrast to men being less likely to be non-searching unemployed in urban areas. Improvement in local labour market conditions as indicated by a hypothetical decrease in the magisterial district unemployment rate reveals the expected effects on searching and non-searching probabilities for women only: increasing narrow labour force participation. A separate prediction for younger individuals up to age 35 might be expected to bring this effect out stronger for men and women.

1.4 Concluding Remarks

We linked observed outcomes in the labour market to observed characteristics which affect costs and benefits, and thus decisions to be in one of the three jobless states on the supply side of the labour market. We have suggested an analytical approach which may feed into a broader labour market model for South Africa. Such a model would be of immense importance to policy-makers.

We have described some of the prominent features of those without jobs, noting that the most seriously affected groups have not altered much between 1997 and 1999. The descriptive model presented is constructive in explaining why it may be rational for individuals to choose a strategy of non-search and a low degree of labour force attachment in an environment of mass unem-

[19] Such possible endogeneity of variables would raise the problem of inconsistent and biased estimators.

ployment. It also highlights the importance of thinking about labour market participation as a continuum, where individuals may choose different search intensities. Further analysis of this idea is restricted due to the currently available data.

On certain characteristics (e.g. age) non-searchers and searchers are more alike, and on others non-searchers are more like those out of the labour force (e.g. education and location). They are the group at the margin which is expected to flip over into the labour force when conditions change. The empirical analysis could not confirm a massive increase in searching unemployment in response to improved labour market conditions. The responsiveness of non-searchers could be better addressed through a disaggregated analysis of this group. Younger unemployed people without work experience but higher education are likely to be more employable than older unemployed with no previous work experience; thus the benefits to search in a labour market with more job opportunities are likely to be higher for younger age groups.

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2 Appendix

Figure 2: Narrow and Broad Unemployment Rates, Searching and Labour Force Participation 1997

Narrow and Broad Unemployment Rates, Searching and Labour Force Participation 1997

OHS 1997	Narrow Unemployment Rate	Broad Unempl. Rate (Searchers and Non-searchers)	Non-Searchers as % of broad Unemployed	Non-Searchers as % of total Labour Force	LFP rate (narrow)	LFP rate (broad)
	%	%			%	%
Total	21.3	36.0	51.8	18.5	47.7	58.6
By Gender						
Male	17.4	29.0	48.3	13.9	56.9	66.2
Female	26.8	44.6	54.6	24.1	38.8	51.3
By Location						
Urban Old RSA	19.3	28.9	41.3	11.8	57.3	65.0
Rural Old RSA	16.8	34.8	62.0	21.3	46.6	59.4
Urban TBVC&SGT	24.3	41.0	53.5	21.8	48.4	62.1
Rural TBVC&SGT	33.7	58.1	63.5	36.7	27.6	43.6
By Race						
African	27.2	44.7	53.9	23.8	43.0	56.5
Coloured	15.0	22.3	38.9	8.7	60.0	65.7
Indian	9.7	12.1	21.8	2.7	57.5	59.1
White	4.3	5.9	27.9	1.6	64.6	65.7
By Province						
Western Cape	11.2	16.7	37.1	6.2	61.2	65.3
Eastern Cape	29.8	52.3	61.3	31.8	31.3	45.1
Northern Cape	18.5	25.6	33.7	8.6	53.0	58.1
Free State	19.3	32.4	50.2	16.2	51.5	61.6
KwaZulu-Natal	23.0	42.4	59.5	25.1	42.5	56.9
North West	21.4	40.7	60.3	24.4	45.0	59.7
Gauteng	21.8	30.9	37.5	11.6	62.5	70.8
Mpumalanga	22.4	34.0	44.1	14.9	46.5	54.8
North. Province	25.9	45.4	58.1	26.2	33.7	45.8
By Age group						
16-20	44.7	63.1	52.9	33.4	10.2	15.3
21-25	37.1	54.0	49.8	26.9	40.0	54.6
26-30	27.3	43.0	50.2	21.6	59.3	75.6
31-35	20.1	34.3	51.6	17.7	64.4	78.2
36-45	14.7	26.7	52.9	14.1	65.5	76.3
46-55	10.6	21.5	56.9	12.2	55.5	63.6
56-64	7.1	16.0	60.4	9.6	38.4	42.4

Source: Own Calculations from OHS 1997.
LFP = labour force participation. Narrow LFP is the total working age population in employment or strict unemployment; broad LFP is narrow LFP plus the non-searchers.

Figure 3: Narrow and Broad Unemployment Rates, Searching and Labour Force Participation 1999

Narrow and Broad Unemployment Rates, Searching and Labour Force Participation 1999

OHS 1999	Narrow Unemployment Rate	Broad Unempl. Rate (Searchers and Non-searchers)	Non-Searchers as % of broad Unemployed	Non-Searchers as % of total Labour Force	LFP rate (narrow)	LFP rate (broad)
	%	%			%	%
Total	23.2	36.1	46.3	16.7	54.2	65.0
By Gender						
Male	19.6	29.9	42.6	12.7	61.7	70.7
Female	27.8	43.1	49.2	21.2	47.0	59.6
By Location						
Urban Old RSA	20.9	30.7	40.2	12.3	62.4	71.1
Rural Old RSA	15.4	29.0	55.5	16.1	55.4	66.1
Urban TBVC&SGT	29.8	38.8	33.4	12.9	59.5	68.1
Rural TBVC&SGT	38.5	58.2	55.0	32.0	34.0	50.1
By Race						
African	29.1	43.9	47.6	20.9	49.8	62.9
Coloured	15.2	23.1	40.3	9.3	65.6	72.4
Indian	15.3	19.6	25.8	5.1	63.4	66.8
White	4.7	6.5	29.2	1.9	70.9	72.3
By Province						
Western Cape	13.8	18.7	30.5	5.7	69.0	73.2
Eastern Cape	29.7	47.3	53.0	25.0	40.8	54.5
Northern Cape	17.1	27.5	45.9	12.6	56.8	65.0
Free State	23.2	33.9	41.3	14.0	56.6	65.8
KwaZulu-Natal	25.8	38.1	43.2	16.5	52.4	62.7
North West	23.5	41.4	56.7	23.4	48.7	63.6
Gauteng	20.5	31.7	44.4	14.1	64.6	75.2
Mpumalanga	24.7	37.3	45.0	16.7	51.2	65.0
North. Province	33.9	50.7	50.1	25.4	40.9	54.8
By Age group						
16-20	43.5	60.7	50.1	30.4	13.9	20.0
21-25	40.5	55.0	44.3	24.3	49.6	65.5
26-30	29.2	42.4	43.9	18.6	67.6	83.1
31-35	20.7	32.1	44.9	14.4	72.2	84.4
36-45	15.9	26.0	46.4	12.1	73.1	83.2
46-55	10.8	21.0	54.4	11.4	62.4	70.5
56-64	7.3	17.0	61.2	10.4	40.5	45.2

Source: Own Calculations from OHS 1999.
LFP = labour force participation. Narrow LFP is the total working age population in employment or strict unemployment; broad LFP is narrow LFP plus the non-searchers.

Figure 4: Descriptive Statistics for Explanatory Variables - Average Characteristics of Africans

DESCRIPTIVE STATISTICS FOR EXPLANATORY VARIABLES - AVERAGE CHARACTERISTICS OF AFRICANS

African Working Age Population in 1997	EMPLOYED		SEARCHING UNEMPLOYED		NON-SEARCHING UNEMPL.		NON LABOUR MARKET PART.	
VARIABLES	Men	Women	Men	Women	Men	Women	Men	Women
INDIVIDUAL CHARACTERISTICS								
Average age	37.47	37.30	31.48	31.30	32.18	31.83	27.10	29.34
Education[1]								
- None & Primary	0.13	0.12	0.08	0.08	0.14	0.14	0.10	0.14
- Senior Primary	0.29	0.25	0.29	0.26	0.36	0.32	0.27	0.25
- Secondary	0.34	0.35	0.37	0.38	0.37	0.37	0.51	0.50
- Matric	0.16	0.17	0.22	0.25	0.16	0.16	0.09	0.09
- Diploma/Cert.	0.06	0.10	0.03	0.03	0.01	0.01	0.02	0.01
- Tertiary	0.02	0.02	0.01	0.003	0.002	0.001	0.003	0.001
Never worked before[2]	-	-	0.68	0.76	0.77	0.83	0.71	0.79
Married/Living with partner	0.67	0.46	0.25	0.37	0.25	0.39	0.15	0.33
HOUSEHOLD CHARACTERISTICS								
HH size[4]	5.01	5.69	6.14	6.52	6.64	6.65	6.68	6.56
Per capita HH expenditures	275.90	255.02	140.47	144.01	121.88	124.67	146.53	144.68
Number of dependants in HH	1.73	2.11	1.83	2.49	2.17	2.73	2.26	2.60
Presence of pensioner in HH[5]	0.14	0.20	0.33	0.28	0.39	0.30	0.34	0.27
Migrant members in HH[6]	0.08	0.13	0.16	0.18	0.22	0.27	0.28	0.32
REGIONAL INDICATORS								
Area[7]								
- Urban old RSA	0.55	0.54	0.55	0.55	0.36	0.36	0.38	0.32
- Rural old RSA	0.19	0.15	0.11	0.12	0.16	0.18	0.14	0.17
- Old homeland or Self Governing Territory	0.26	0.31	0.34	0.33	0.48	0.46	0.48	0.51
Magisterial District unemployment rate (broad)[8]	0.39	0.42	0.45	0.44	0.50	0.50	0.50	0.51

Notes: Authors' own calculations from OHS 1997, over the African working age population (ages15-60 for women and 15-65 for men). All statistics are weighted.

[1]Proportion of individuals in each labour market category with at least the specified education level

[2]Proportion of individuals in each labour market category answering 'No' to "Ever worked before?"

[3]Proportion of individuals in each labour market category who are head of household

[4]Average household size for individuals in each labour market category (eg: employed African men live in households where average size is 5.01 people)

[5]Proportion of individuals in each labour market category living in households with at least one pensioner

[6]Proportion of individuals in each labour market category living in households with at least one migrant worker

[7]Proportion of individuals for each labour market category living in the specified area

[8]Magisterial district broad unemployment rates calculated from the 1996 Census

Figure 5: Descriptive Statistics for Explanatory Variables - Average Characteristics of Africans

DESCRIPTIVE STATISTICS FOR EXPLANATORY VARIABLES - AVERAGE CHARACTERISTICS OF AFRICANS								
African Working Age Population in 1999	EMPLOYED		SEARCHING UNEMPLOYED		NON-SEARCHING UNEMPL.		NON LABOUR MARKET PART.	
VARIABLES	Men	Women	Men	Women	Men	Women	Men	Women
INDIVIDUAL CHARACTERISTICS								
Average age	36.9	36.9	31.0	30.2	31.7	31.1	26.1	29.3
Education								
- None & Primary	0.17	0.16	0.11	0.09	0.17	0.15	0.12	0.17
- Senior Primary	0.26	0.25	0.24	0.21	0.29	0.27	0.26	0.24
- Secondary	0.32	0.30	0.38	0.40	0.35	0.38	0.51	0.48
- Matric	0.18	0.18	0.23	0.26	0.18	0.19	0.10	0.10
- Diploma/Cert.	0.04	0.08	0.03	0.03	0.01	0.02	0.01	0.01
- Tertiary	0.03	0.04	0.01	0.01	0.01	0.003	0.003	0.003
Never worked before	-	-	0.64	0.71	0.72	0.79	0.89	0.88
Married/Living with a partner	0.50	0.37	0.18	0.26	0.19	0.33	0.12	0.26
HOUSEHOLD CHARACTERISTICS								
HH size	4.14	4.96	5.79	6.11	6.17	6.21	6.34	6.45
Per capita HH expenditures	450.53	358.71	168.97	188.87	136.80	147.16	185.55	173.01
Number of dependants in HH	1.32	1.80	1.79	2.27	2.04	2.53	2.16	2.52
Presence of pensioner in HH	0.09	0.14	0.28	0.24	0.34	0.28	0.30	0.27
Migrant members in HH	`	0.14	0.18	0.21	0.23	0.26	0.31	0.33
REGIONAL INDICATORS								
Area								
- Urban old RSA	0.54	0.51	0.53	0.51	0.40	0.41	0.37	0.33
- Rural old RSA	0.22	0.18	0.10	0.11	0.12	0.16	0.15	0.17
- Old homeland or Self GoverningTerritory	0.24	0.31	0.37	0.37	0.46	0.43	0.48	0.50

Notes: Authors' own calculations from OHS 1999, over the African working age population (ages15-60 for women and 15-65 for men). All statistics are weighted.
See Fig.4

Figure 6: Multinomial logit model of labour market state - African Men (OHS 1997)

Multinomial logit model of labour market state – African Men (OHS1997)

LABOUR MARKET STATE	Employed		Searching		Non-Searching	
(relative to out of the labour force)	Coeff.	Std.Err	Coeff.	Std. Err	Coeff.	Std.Err
Individual Characteristics						
Age	0.593**	0.012	0.536**	0.015	0.53	0.014
Age square	-0.007**	0.000	-0.007**	0.000	-0.007**	0.000
Years of Educ up to Std 1	0.096**	0.026	0.167**	0.036	0.106**	0.030
Years of Educ up to Std 5	-0.035	0.026	-0.044	0.044	-0.074*	0.074
Years of Educ up to Std. 9	-0.082**	0.020	-0.113**	0.023	-0.174**	0.174
Matric	1.031**	0.080	1.067**	0.092	0.993**	0.097
Years of Higher Education	0.312**	0.086	-0.045	0.098	-0.452**	0.452
Married	1.469**	0.065	0.193*	0.085	0.127	0.08
Household Characteristics						
Household size	-0.079**	0.014	-0.009	0.019	0.013	0.018
No. of children < 16 in household	0.075**	0.023	-0.066*	0.027	-0.047*	0.028
Per capita hhold expenditure	0.001**	0.000	-0.514**	0.002	-0.001	0.000
Pensioner in household	-0.462**	0.059	-0.131	0.069	-0.024	0.067
Migrant worker	-0.563**	0.065	-0.204**	0.075	-0.086	0.067
Regional Characteristics						
Urban area	-0.329**	0.067	0.262**	0.083	-0.234**	0.079
Broad MD unemp rate	-3.994**	0.217	-0.773**	0.249	0.085	0.231
Cons	-8.717**	0.259	-9.704**	.0299	-9.634**	0.293
N	17057		4687		5489	

* * and * indicate significance at the 1 and 5 percent level. Estimates are relative to out of the labour force. The effect of education has been estimated using linear splines. Hausman tests have been performed to examine whether independence of irrelevant alternatives (IIA) does hold. The given data does not reject this assumption underlying the multinomial logit.

Figure 7: Multinomial logit model of labour market state - African Women (OHS 1997)

Multinomial logit model of labour market state – African Women (OHS1997)

LABOUR MARKET STATE	Employed		Searching		Non-Searching	
(relative to out of the labour force)	Coeff.	Std.Err	Coeff.	Std. Err	Coeff.	Std.Err
Individual Characteristics						
Age	0.657**	0.014	0.570**	0.016	0.479**	0.013
Age square	-0.008**	0.000	-0.008**	0.000	-0.007**	0.000
Years of Educ up to Std 1	0.044*	0.022	0.076**	0.029	0.053*	0.022
Years of Educ up to Std 5	0.065**	0.024	0.073*	0.029	-0.007	0.022
Years of Educ up to Std. 9	-0.010	0.019	-0.119**	0.021	-0.152**	0.018
Matric	0.990**	0.073	1.198**	0.077	0.846**	0.075
Years of Higher Education	0.663**	0.065	0.066	0.078	-0.505**	0.117
Married	-0.622**	0.045	-0.433**	0.056	-0.383**	0.048
Household Characteristics						
Household size	-0.021	0.012	0.022	0.015	-0.003	0.015
No. of children < 16 in household	0.016	0.019	-0.029	0.023	0.002	0.021
Per capita hhold expenditure	0.000*	0.000	-0.001**	0.000	-0.001**	0.000
Pensioner in household	-0.215**	0.052	-0.003	0.064	0.107*	0.051
Migrant worker	-0.605**	0.052	-0.262**	0.063	-0.140**	0.048
Regional Characteristics						
Urban area	0.172**	0.062	0.599**	0.076	0.192**	0.065
Broad MD unemp rate	-2.580**	0.192	-1.159**	0.224	0.008	0.173
Cons	-12.024**	0.305	-10.668**	0.305	-8.730**	0.250
N	19801		3873		3650	

* * and * indicate significance at the 1 and 5 percent level. Estimates are relative to out of the labour force. The effect of education has been estimated using linear splines. Hausman tests have been performed to examine whether IIA does hold. The given data does not reject this assumption underlying the multinomial logit.

Figure 8: Predicting the effects of changes in explanatory variables - African Men (OHS 1997)

Predicting the effects of changes in explanatory variables - African Men (OHS 1997)				
LABOUR MARKET STATE	Employed	Searching	Non-Searching	Out of Labour Force
Base Probability	0.40	0.11	0.12	0.37
One year of school up to Std 1	0.01	0.04	0.03	-0.04
One year of school up to Std 5	0.00	-0.00	-0.04	0.02
One year of school up to Std. 9	0.70	-0.03	-0.08	0.04
Matric	0.18	0.31	0.22	-0.35
One year of training/tertiary educ.	0.14	-0.11	-0.31	-0.02
Married	0.52	-0.37	-0.37	-0.33
HH size (+1 member)	-0.03	0.02	0.03	0.36
Children<16 in HH (+1 dependent)	0.04	-0.05	-0.04	-0.01
Per capita HH expenditure (*)	0.08	-0.15	-0.13	0.00
Pensioner in HH	-0.18	0.07	0.16	0.12
Migrant worker	-0.13	0.06	0.12	0.12
Urban area	-0.13	0.30	-0.07	0.08
Broad MD unempl. rate (**)	0.13	-0.07	-0.12	-0.08

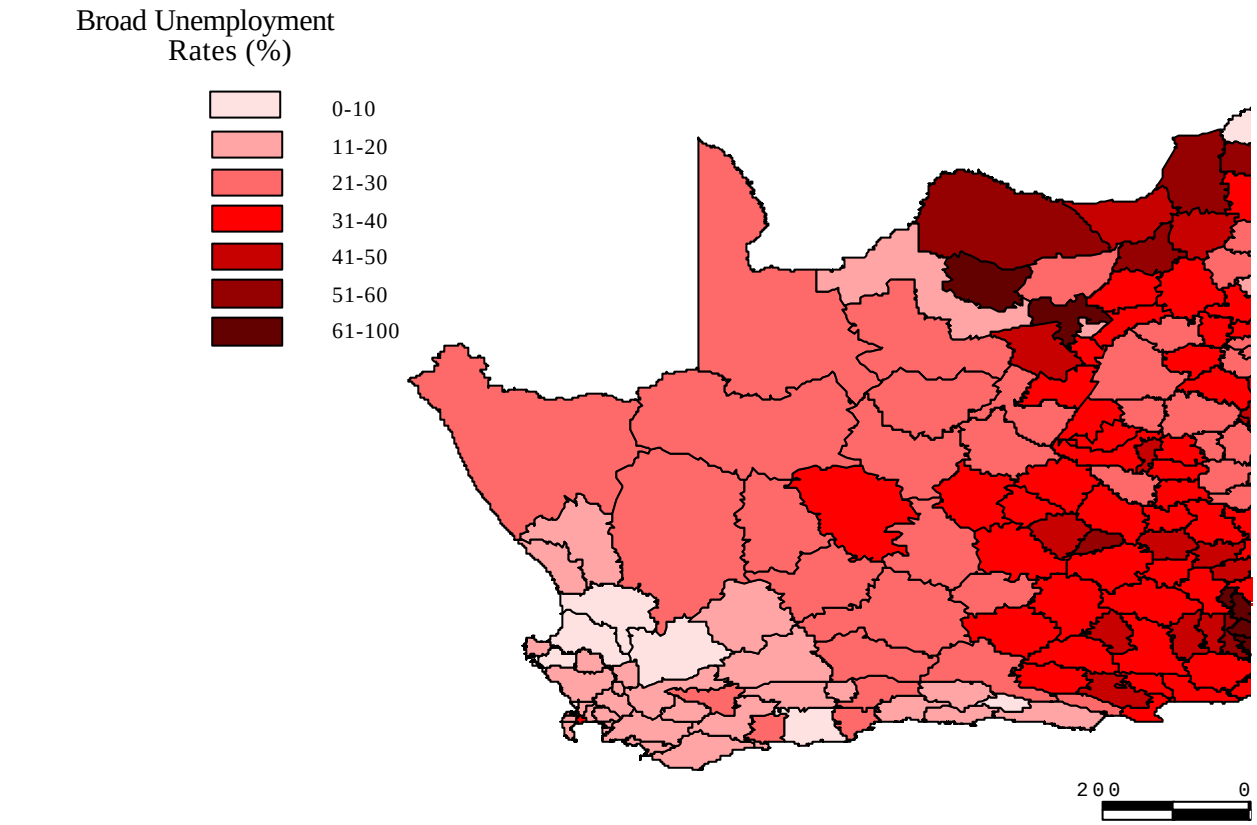
(*) Effect of a doubling of mean per capita household expenditure. (**) Effect of a drop in the broad magisterial district unemployment rate by 10 percentage points.

Figure 9: Predicting the effects of changes in explanatory variables - African Women (OHS 1997)

Predicting the effects of changes in explanatory variables - African Women (OHS 1997)				
LABOUR MARKET STATE AFRICAN WOMEN	Employed	Searching	Non-Searching	Out of Labour Force
Base Probability	0.23	0.12	0.15	0.50
One year of school up to Std 1	0.01	0.03	0.03	-0.02
One year of school up to Std 5	0.03	0.03	-0.03	-0.01
One year of school up to Std. 9	0.53	-0.06	-0.08	-0.03
Matric	0.32	0.49	0.18	-0.32
One year of training/tertiary educ.	0.49	-0.15	-0.36	-0.08
Married	-0.23	-0.09	-0.07	0.15
HH size (+1 member)	-0.01	0.00	0.00	0.00
Children<16 in HH (+1 dependent)	0.01	-0.18	0.00	-0.00
Per capita HH expenditure (*)	0.10	-0.10	-0.08	0.02
Pensioner in HH	-0.09	0.02	0.10	0.00
Migrant worker	-0.26	-0.05	0.01	0.08
Urban area	0.01	0.32	0.04	-0.09
Broad MD unempl. Rate (**)	0.10	0.03	-0.05	-0.04

(*) Effect of a doubling of mean per capita household expenditure. (**) Effect of a drop in the broad magisterial district unemployment rate by 10 percentage points.

Figure 10: Broad Unemployment Rates by Magisterial District - 1996



Source: Calculated from 1996 South African Census
T. Dinkelman & F. Pirouz, Sept 2000