

# From Labour Market Misperceptions to Wage Scarring

The long-term impacts of Youth Unemployment

by

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# 1 Introduction

The South African labour market is the subject of vigorous research in the academic community, but also remains on the forefront of social and political debate at all levels of society. High unemployment dominates the discussion, and the ASGISA vision of halving unemployment by 2014 is an objective which demands attention in every decision-making process. How are policy makers to “tame the beast” (Kingdon & Knight, 2004) and smooth the transition from searching to occupying a job?

Youth unemployment features prominently in this picture. How is it that higher levels of educational attainment in South Africa among these cohorts has not lead to greater levels of absorption? This is a concern, given the extensive international evidence which highlights both the economic and psychological impacts which can be traced to an initial period of unemployment. These effects unduly effect the youth, and potentially initiate a “scar” which affects their future labour market and social outcomes.

The role of misperceptions, which hinder the job search process, is an important consideration when studying this group. It is possible that *initial* misperceptions and wrong expectations have a bearing on the *current* possibility of finding suitable work, and that these impacts can be traced in periods much later in life. When young participants are unaware of their true prospects in the labour market, they may overvalue their human capital. Hence, despite an increase in the aggregate stock of human capital, this investment may prove fruitless if not viewed in a realistic manner. It is imperative that those on the periphery of the labour market be drawn into the fray, to prevent long-term spirals of unemployment, poverty and emotional ills.

This paper explores ways and means to avoid scars, and to facilitate optimal attachment to the labour market. Section 2 considers a number of trends in youth unemployment in South Africa, while section 3 investigates the material and psychological scars of unemployment. Section 4 formulates a model which hypothesises that *initial* labour market misperceptions lead to *future* wage depression and lower employability. Section 5 offers some suggestions to prevent scarring. Section 6 concludes.

## **2 Youth Unemployment and Persistence in South Africa**

Abundant empirical work in the South African context highlights the severities of unemployment. Wittenberg (2002: 1164) identified two problematic features of this phenomenon: both the poor long-term absorptive capacity of the economy, as well as short-term concerns associated particularly with younger individuals, who flow out of school more rapidly than the economy can accommodate. While jobs are being created in the economy, labour supply surges – attributed partially to earlier entry into the labour market – have fuelled unemployment. Branson & Wittenberg (2007: 319) show that recent generations of young labour market participants are obtaining jobs at the *same age* as previous cohorts; this is despite the fact that their educational attainment is superior to previous generations, and that they leave school earlier. This entails a longer period of initial unemployment, despite recent generations' educational advantage. The question is what impact does this period of unemployment have on the labour market trajectory of these individuals over their respective life cycles?

Given these shortcomings, it is important to uncover some of the interplays between the short and long-run states. Is it possible that poor labour market outcomes have a magnified impact, both through time-persistent unemployment and through the impact of the “initial state” on a cycle of misperception and continued search? Is it possible that the effects of youth unemployment pass through the rest of the life cycle due to a state of non-employability? Wittenberg (2002: 1195) concludes pessimistically that the decline in unemployment at later ages is partially attributable to the emergence of large numbers of discouraged workers, and not a flow from search to employment.

## **3 What is Labour Market Scarring?**

Unemployment incurs costs to the individual. These extend beyond a period without income security, but may have persistent overarching effects, even much later in life. Gregg and Tominey (2005) offer a recent contribution to an established literature which explores the impacts of “scarring”, particularly among the youth. Those who have passed through an extended episode at the fringes of the labour market are likely to be less employable. This is largely attributable to the fact that firm-specific skills obtained in a previous job cannot be directly transferred to a different work environment. Even if this

is not the case, skills may erode as time outside the workplace progresses. In the case of first entrants to the labour market, schooling is poorly comparable to the firm-specific skills required in the workplace. This skill mismatch between the offers and requirements of participants and employers brands searchers unemployable. Once a job is obtained, this scar can be obliterated, as individuals are able to accumulate necessary skills while tenured in a firm. Gregg and Tominey (2005: 506), however, trace remnants (in terms of lower wages) of youth unemployment up to twenty years after the initial occurrence.

### ***3.1 Unemployment and Unhappiness***

The implications of scarring are vast. Should labour market entrants be unfortunate enough to seek their first job during a temporary economic downturn or in a tightly regulated labour market, it could affect their future prospects of finding employment permanently (Raum and Roed, 2002). The costs of unemployment are, however, not limited to labour market and material welfare, but affect emotional stability, and consequently household relationships. Gallo et al (2006) establish strong associations between unemployment and *subsequent* spells of depression among the elderly, which suggests that the scar persists beyond the actual occurrence. Clark et al (2001) provide more extensive evidence, which suggests that unhappiness due to current unemployment is attenuated by past unemployment. This suggests that the “scar” referred to in the labour market literature also surfaces in the broader circumstances of unemployed individuals.

Powdthavee (2003) finds that the unemployed in South Africa are on average unhappier than those in wage employment, even after accounting for socioeconomic differentials – hence it is not only the poverty resulting from unemployment which causes disutility, but larger impacts are at play. However, those who chose not to participate at all were happier than the searching unemployed; this could (inter alia) mean that the cessation of search in a tight labour market reduces self-imposed pressures and anxiety to find work. People “accept their fate” and learn to cope with their position by alternative means. Joblessness is therefore a double carrier of disutility: both by introducing a lack of economic autonomy and by adding psychological burdens.

### ***3.2 From Misperceptions to Scarring – psychological economics***

If scarring is such an important factor in the labour market, it is by implication true that misperceptions could indirectly contribute to these eventual detrimental effects. Should participants be over-optimistic about their prospects, subsequent disappointment could leave lasting footprints. Easterlin (2001) postulates that people pursue activities which they hope to make them happier than they currently are, and consequently always rate their *anticipated utility* higher than what they currently experience. Furthermore, past experiences are usually berated. Individuals tend to remember long and rare spells of unemployment most clearly compared to shorter periods, which underscores the persistent psychological impacts which remain (Jürges, 2005). These cycles are important in the current context: over-optimistic estimates of *future* labour market success not only leads to disappointment, but may also reduce future labour market returns, as the model below postulates.

## **4 A Model of Misperceptions and Scarring**

This section formalises the path from individuals' perceptions to *labour market* scarring. Broader scarring is not formally modelled. The central hypothesis is that misperceptions result in disequilibria between the supply and demand sides of the labour market. Should wages be set too optimistically by job searchers, a period of unemployment arises. Adaptive expectations are important to remedy this situation: however, should these alterations be incomplete (due to concurrent and unaccounted shifts in other parts of the labour market), mismatches persist. Dynamics are explored on the part of both employers and job searchers to trace the point where offers and demands coincide to reach a match.

Cahuc and Zylberberg (2004: 406-411) hypothesise a division between current and potential employees into “insiders and outsiders” respectively. Should the costs of hiring and firing insiders be substantially high, it would be of no benefit for firms to take on outsiders with similar productivity levels, even at a relatively low wage. These costs also include human capital losses, associated with the dismissal of workers with “know - how” accumulated within the firm. If the stock of insiders is low, it is possible that these individuals can negotiate high wages (despite high levels of unemployment), precisely because their value to the firm is higher than savings resulting from paying low wages to

outsiders. This has important implications for the South African labour market, where high unemployment could leave outsiders in the dark, even at low reservation wages. Tight labour legislation could compound these effects, leading to greater bargaining power for insiders (especially if organised labour unions carry influence). Potential youth entrants may therefore remain out of the fray until such a time as sufficient connections within the labour market are established.

Suppose agents choose their reservation wage by finding the expected value of possible wages currently on offer in the labour market. In the function,  $\pi_w$  are their *perceived* probabilities of finding a job with the associated wage ( $w$ ). If youth are over-confident, they choose these weights to be high at levels of  $w$  that are unwarranted, according to a distribution which more accurately depicts the advantages which accrue to insiders:

$$w_{reservation} = \int \pi_w w dw$$

$$\sum_w \pi_w = 1 \text{ and } \pi_w > 0 \text{ for all possible } w > 0$$

In contrast, employers may offer wages according to an “outsider” distribution, with the  $\tilde{\pi}$  now representing the labour demand associated with each wage. Should this distribution carry more weight in the lower tail, as a result of lower wage offers to outsiders, it is evident that no job match will take place, as  $w_{reservation} > w_{offer}$

$$w_{offer} = \int \tilde{\pi}_w w dw$$

To lend tractability to this analysis, a binary distribution is illustrated here, with only two possible wages; those of insiders and outsiders. It is assumed that youth labour market entrants are initially “outsiders” and that those with labour market experience are “insiders”, and consequently hold more bargaining power. Now outsiders gauge reservation wages by assessing their likelihood of obtaining a “good job” alongside insiders. This implicit calculation considers the experiences of acquaintances in the labour market. Consequently, the quality of this signal (which is influenced by how closely outsiders are connected to insiders) determines whether searchers perceive correctly. Entrants may compare themselves to other insiders with the same pre-labour market human capital (for instance a matric certificate) and choose wages accordingly. They do not, however, consider that a number of differences might arise. Firstly,

entrants do not account for the post-entry human capital which insiders accrue in the form of “on-the-job training”, nor do they consider the bargaining power which their “peers” inside the labour market may have accumulated. Each of these favours the wage distribution of insiders (with higher employment probabilities at the higher inside wage) in comparison to outsiders. Also, intertemporal changes in both labour market conditions, as well as school quality may have changed the value of the same type of education – this change may go unnoticed by entrants. For instance, does a matric certificate guarantee the same probability of absorption as in times past?

A scan of the happiness literature provides some clues with regards to these sentiments. South Africans who have obtained matric are found to be significantly unhappier individuals, compared to the higher degrees of wellbeing recorded by those who have progressed beyond this attainment (Powdthavee, 2003: 7-8). This is attributed to the high returns which are anticipated in the labour market upon entry; once these expectations do not reach full fruition, pessimism ensues. Pre-entry expectations among South Africans, particularly within secondary schools, are perhaps mismatched with the way the labour market functions in reality, and could be a possible driver of youth unemployment. Oosthuizen (2006: 1) indicates that the optimism associated with the political transition was not converted into any significant gains, attributable largely to jobless growth. The potential for misinterpreting labour market conditions could therefore have a severe impact on those who would have expected a positive change in fortunes, but whose situations have not changed.

Frijters et al (2003) present evidence from post-reunification Germany, which could be instructive for South Africa. It was found that shortly after the changeover, East Germans experienced initially low levels of satisfaction, but at the same time expected this to improve vastly in future. Only a number of years after the transition did their expectations match their experiences: it is clear that their optimism was unwarranted and that a learning process followed the initial euphoria, as their anticipated levels of happiness adapted in response to the realised stimuli. The young in particular are prone to forecast future utility too optimistically, given their poor point of reference. The prospect of social changes compounds these effects, which could result in distinct disappointment. In South Africa, the combination of a changing political landscape and

higher educational attainment could have potentially resulted in considerable optimism, which has possibly not been realised.

Outsiders' reservation wages, as presented below, may therefore be based on severe misperceptions about their ability to break into "insider jobs", by setting  $\pi_{insider_t}$  optimistically high:

$$w_{reservation_t} = \pi_{insider_t} w_{insider_t} + (1 - \pi_{insider_t}) w_{outsider_t}$$

and

$$w_{j_t} = w(h_{j_t}); \quad w'(h_{j_t}) > 0 \quad j = insider; outsider$$

where  $h_j$  is the human capital endowment and  $h_{insider_t} > h_{outsider_t}$

$$\Rightarrow w(h_{outsider_t}) > w(h_{insider_t})$$

As a result  $w_{outsider_t} \leq w_{reservation_t} \leq w_{insider_t}$ , where equality only holds if  $\pi_{insider_t} = 0$  or 1 (entrants perceive that they will almost certainly receive either an inside or outside wage). New entrants will therefore not accept outsider wages in the first period of search (unless they accept that their probability of obtaining anything but an outsider job is 0). This will be particularly true if they set their reservation wage closer to  $w_{insider_t}$  by judging  $\pi_{insider_t}$  optimistically high (as a result of observing the "insider" distribution rather than that of other "outsiders"). The wage on offer, however, is  $w_{outsider_t}$  (or  $\pi_{insider_t} = 0$ ), assuming that the entire mass of the outsider distribution falls on the outsider wage:

$$\begin{aligned} & W_{offer_t} \\ &= W_{outsider_t} \\ &= W_{outsider_t} + \pi_{insider_t} W_{outsider_t} - \pi_{insider_t} W_{outsider_t} + \pi_{insider_t} W_{insider_t} - \pi_{insider_t} W_{insider_t} \\ &= \pi_{insider_t} W_{insider_t} + (1 - \pi_{insider_t}) W_{outsider_t} - \pi_{insider_t} (W_{insider_t} - W_{outsider_t}) \\ &= w_{reservation_t} - \pi_{insider_t} (w_{insider_t} - w_{outsider_t}) \end{aligned}$$

Reservation wages clearly overshoot offered wages, resulting in a job mismatch; the difference is a function of the wage differential and the perceived probability of being offered an insider job. An immediate match is possible if  $\pi_{insider_t} = 0$ , which entails

accepting the outsider wage distribution as true. Setting  $\pi_{insider_t} > 0$  entails a misperception in this setting. The higher the value assigned to  $\pi_{insider_t}$ , the larger the difference between offered and reservation wages and the less likely a match occurs.

In the next period, previous failure induces a process of correction of youths' perceptions, represented by  $\beta_{t+1}$  - a reduction in the perceived probability of finding an insider job. This consequently reduces the reservation wage.  $\beta_{t+1}$  is not necessarily set equal to  $\pi_{insider_t}$ , as the hope to obtain a better job persists.

$$\begin{aligned}
 w_{reservation_{t+1}} &= (\pi_{insider_t} - \beta_{t+1}) w_{insider_t} + (1 - \pi_{insider_t} + \beta_{t+1}) w_{outsider_t} \\
 &= \pi_{insider_t} w_{insider_t} - \beta_{t+1} w_{insider_t} + (1 - \pi_{insider_t}) w_{outsider_t} + \beta_{t+1} w_{outsider_t} \\
 &= w_{reservation_t} - \beta_{t+1} [w_{insider_t} - w_{outsider_t}] \\
 &\text{where } 0 < \beta_{t+1} \leq \pi_{insider_t} < 1 \\
 \pi_{insider_{t+1}} &= \pi_{insider_t} - \beta_{t+1}
 \end{aligned}$$

Therefore, the reservation wage is the previous reservation wage with an adjustment term: this introduces adaptive expectations into the model. This term unambiguously reduces the reservation wage from period  $t$  to period  $t+1$ , and represents a correction for the misperception related to employment probabilities in the previous period. Comparing this term to the previous equation, it is evident that this specific misperception is not completely corrected unless expectations undergo a "full adjustment" according to  $\pi_{insider_t} = \beta_{t+1}$ . Should this condition not be met, disequilibrium persists.

The demand side, however, also witnesses a shift, with  $\theta_{t+1}$  representative of unanticipated reductions in outsiders' human capital (due to outdated and unexercised school knowledge) relative to that of insiders (whose increasing job-specific skills advantage them). While insider labour demand and insider wages may increase as a result of increases in human capital, the opposite holds true for outsiders.

$$\begin{aligned}
& W_{offer_{t+1}} \\
&= W_{outsider_{t+1}} \\
&= W_{outsider_t} - \theta_{t+1} \\
&= W_{reservation_t} - \pi_{insider_t} (W_{insider_t} - W_{outsider_t}) - \theta_{t+1} \\
&= W_{reservation_{t+1}} + \beta_{t+1} (W_{insider_t} - W_{outsider_t}) - \pi_{insider_t} (W_{insider_t} - W_{outsider_t}) - \theta_{t+1} \quad (from (5)) \\
&= W_{reservation_{t+1}} - \pi_{insider_{t+1}} [W_{insider_t} - W_{outsider_t}] - \theta_{t+1}
\end{aligned}$$

$$\theta_{t+1} = \theta(\Delta h_{outsider_{t+1}}); \theta'(\Delta h_{outsider_{t+1}}) < 0$$

but

$$\Delta h_{outsider_{t+1}} < 0 \Rightarrow \theta_{t+1} > 0$$

The differential between reservation wages and offered wages is influenced by a number of factors. First, the relative changes in perceived insider and outsider wages is attenuated by the adjusted perceived probability of finding an insider job. The *original* wage differential still persists as a partial cause of disequilibrium, if the adjusted probability has not yet tended to zero. The last term represents a new source of instability: because  $\theta_{t+1} > 0$  – as a result of a deterioration in outsiders' human capital – it reduces the wage offered to the searching unemployed. While a “full correction” may follow after initially observing the incorrect wage distribution (in other words  $\pi_{insider_{t+1}} \rightarrow 0$ ), outsiders need to account for this additional penalty. As a result, the supply side responds to past stimuli, while the demand side's concurrent movement “outpaces” any adjustment on the part of participants to reach a job match. Though these ‘cat and mouse’ movements may persist for some time, the size of the deviations between supply and demand diminishes, as entrants may start calculating similar adjustments into their decisions ahead of time.

This process can be generalised for a typical period  $t+i$  ( $i$  periods after the initial entry):

$$W_{offer_{t+j}} = W_{reservation_{t+j}} - \pi_{insider_{t+j}} [w_{insider_t} - w_{outsider_t}] - \sum_{s=1}^i \theta_{t+s}$$

$$\pi_{insider_{t+j}} = \pi_{insider_t} - \sum_{s=1}^i \beta_{t+s}$$

$$\sum_{s=1}^i \theta_{t+s} > 0$$

A match only occurs when:

$$\pi_{insider_{t+j}} [w_{insider_t} - w_{outsider_t}] = -\sum_{s=1}^i \theta_{t+s}$$

$$\left[ \pi_{insider_t} - \sum_{s=1}^i \beta_{t+s} \right] [w_{insider_t} - w_{outsider_t}] = -\sum_{s=1}^i \theta_{t+s}$$

$$\pi_{insider_t} w_{insider_t} + (1 - \pi_{insider_t}) w_{outsider_t} - w_{outsider_t} = -\sum_{s=1}^i \theta_{t+s} + \sum_{s=1}^i \beta_{t+s} [w_{insider_t} - w_{outsider_t}]$$

$$w_{reservation_t} - w_{offer_t} = -\sum_{s=1}^i \theta_{t+s} + \sum_{s=1}^i \beta_{t+s} [w_{insider_t} - w_{outsider_t}]$$

That is, a match occurs only when the initial differential between offered and reservation wages is offset by subsequent net adjustments, taking into account diverging movements on the supply and demand sides. It is necessary to note here that the adjustments on the part of the entrant (supply side) can only be affected by  $\beta_{t+s}$ : it is evident that these adjustments have to circumvent not only the initial misperception, but concurrently needs to correct for subsequent human capital depreciation. Furthermore:

$$\pi_{insider_t} [w_{insider_t} - w_{outsider_t}] = -\sum_{s=1}^i \theta_{t+s} + \sum_{s=1}^i \beta_{t+s} [w_{insider_t} - w_{outsider_t}]$$

$$\left[ \pi_{insider_t} - \sum_{s=1}^i \beta_{t+s} \right] [w_{insider_t} - w_{outsider_t}] = -\sum_{s=1}^i \theta_{t+s}$$

Because  $\sum_{s=1}^i \theta_{t+s} > 0$ , it is insufficient for the left of the equation to tend only towards 0 by

setting  $\pi_{insider_t} = \sum_{s=1}^i \beta_{t+s}$  (that is, the adjustments only account for the initial misperception), but the adjusted probability should become artificially negative to

account for the subsequently unaccounted for human capital disadvantage which ensues.

If incomplete adjustment occurs in each period, this process is likely to perpetuate itself, so that outsiders remain unemployed and also become less employable. These individuals may suspend the job search process altogether and become discouraged workers.

The equilibrium wage in period  $t+i$  is

$$\begin{aligned}
 W_{offer_{t+i}} &= W_{reservation_{t+i}} \\
 &= W_{outsider_{t+i}} \\
 &= W_{outsider_t} - \sum_{s=1}^i \theta_{t+s}
 \end{aligned}$$

which is substantially lower than the initial offered outsider wage of  $w_{outsider_t}$ . It is evident that the wages offered to outsiders are substantially depressed, and that this could have a long-lasting impact. It may take some time for a human capital “recovery” to occur to allow the offered wage to return to the original offer. Furthermore, the earlier the match, the smaller the impact of the erosion; if this is the case, recovery can proceed in a shorter space of time.

This gradual erosion of the wage and the long accompanying spell of unemployment is sub-optimal. The best solution for entrants is to secure an early match by setting  $\pi_{insider_{t+1}} = 0$  in the first period so that  $w_{offer_t} = w_{reservation_t} = w_{outsider_t}$ . An offer is made at this early stage, because human capital decreases do not yet disadvantage outsiders. It may still be more profitable for firms to pay a lower wage to outsiders whose (limited) expertise remains relatively intact. It is now possible for entrants to make the transition to becoming insiders and obtain progressively higher wages rather than having to first follow a recovery path.

## 5 Preventing Scarring

The most fundamental way to cancel scarring effects, is to suitably match the quality and type of education with the workplace so that learners become less prone to miscalculate the value of their human capital in the market. The DPRU recently surveyed twenty prominent businesses in South Africa; a common thread in recruiters' perspectives was the presence of inflated expectations of South African university graduates (Paauw et al, 2006: 22). Even in this group – where the probability of unemployment is relatively low – individuals appeared to mispredict their possible positions within the labour market. Furthermore, too many South African students choose the “wrong” qualifications (such as “soft” sciences or diplomas rather than degrees); even “softer” *degrees* could weigh in less substantially than a *diploma* in a technical field (Paauw et al, 2006: 16). Wittenberg (2002: 1193), furthermore, highlights the poor signalling value of a matriculation certificate in the South African labour market, particularly given the large numbers of individuals who have attained this qualification in recent times. For this reason “insider networks” have been more productive channels of matching vacancies with participants.

How is education policy to be altered? Economists are perhaps unqualified commentators on curriculum development; however, institutional arrangements which better encompass the understanding of both education and its role in the labour market may be informed by economic analysis. Soro-Bonmati (2000) tests for differences in transitions from education to labour market outcomes in Italy and Germany. The German education system follows various streams: students likely to enrol for tertiary education complete their *Abitur*, the prerequisite for university entry; “at risk youth” (Soro-Bonmati, 2000: 213) enter schools which focus on vocational training, often in more practical and technical disciplines. In both cases, strong emphasis is placed on completing an apprenticeship in the marketplace during a schooling career. In Italy, in contrast, vocational training is limited to the boundaries of the school. The fundamental difference is the time of first linkage with the labour market “out there”. The model above suggests that earlier contact (which results in “better perceptions” early on) not only shortens the length of unemployment, but improves the wages likely to be attained. Indeed, in Germany, school-leavers were less likely to be unemployed or searching than their Italian counterparts.

In South Africa, the emphasis of secondary schooling has fallen on obtaining a matric certificate; this neither encourages learners to obtain early labour market experience, nor does it allow for young individuals who are unlikely to succeed at the tertiary level, to opt for early training in a suitable trade. Is a “two-stream ” system feasible in South Africa, particular given the political interest of “equal opportunity” following a fragmented educational past? Further, offering apprenticeships to many learners may be unfeasible in areas where severe unemployment prevails. It would be instructive to compare the search processes of graduates from Universities and Universities of Technology (former Technikons): the latter have work experience incorporated into their diploma requirements. Not only is it possible for these candidates to build up employer contacts, but misperceptions about prospects are largely annulled before they enter the labour market full-time. Paauw et al (2006: 21), however, warn of the many technikon students who are unable to graduate, because practical positions are unavailable.

To smooth this process, and given the potential value of “quick linkage” to the labour market, it might be in the entrant’s long-term interests to accept a zeropaying job as an apprentice. This raises the question whether volunteer work has more than just altruistic utility associated with it, or whether it improves labour market prospects. It may also be meaningful to investigate the benefits to school-leavers and graduates of undertaking a “gap year”, even in a field unrelated to their profession. Indeed, Paauw et al (2006: 21) find that students who performed even menial administrative tasks during their university years are more sought after by employers: this is because they acquire the ability to communicate and perform administration effectively. While this may not commonly be perceived to be “human capital”, potential candidates are in this way “tuned in” to situations and scenarios which they could potentially encounter in the workplace. They are almost certainly more well-equipped by their “unimportant”, low-paying positions than graduates who would have shunned the opportunity as “not up to their expectations”.

## **6 An Empirical illustration**

### ***6.1 Methodological approach***

To ascertain the importance of scarring in the South African labour market, it is necessary to follow individuals' labour market transitions over time. The recently released Labour Force Survey (LFS) panel dataset is currently the only nationally representative South African survey which enables such analysis. While this data provides some insights into the phenomenon under consideration, some limitations of the sample question the robustness and validity of the results presented below.

The analysis follows the methods implemented on British data by Arulampalam et. al. (2000). Instead of focussing on the effect of past unemployment on wages later in life, the incidence of current unemployment as a result of initial unemployment is investigated. Dynamic panel data models are implemented, with positively significant coefficients on lagged values of unemployment suggesting that past unemployment directly accentuates current unemployment.

To embark on such a study, a number of considerations apply. First of all, the LFS panel stretches from September 2001 to March 2004 (with waves spaced 6 months apart). As a result, no one birth cohort can be followed from the period of entry through a substantial period in the working-age life-cycle. As a result, the "initial conditions" (observed in Wave 1) which are central to the scarring hypothesis occur at different stages in this cycle for each individual followed. An initial period of unemployment at age 20, for instance, may have a vastly different impact on future labour market status compared to the experience at age 50. For this reason, it is necessary to alter the empirical strategy to obtain realistic results. Before the final specification can be estimated, it is necessary to model (as a cross section) the initial period of unemployment explained by a set of exogenous variables, to capture the impacts of events which happened before the survey:

$u_{i1}^* = \delta' z_i + \eta_i$  where  $u_{i1}^*$  is the underlying propensity to be (broadly) unemployed and  $z_i$  is a strictly exogenous vector<sup>1</sup>. In the spirit of the Heckman two-step estimator, this equation is used to generate an additional regressor to be included in the equation of interest, which controls for “past information” which is not included in the sample (Arulampalam et. al., 2000):

$$\lambda_i = \frac{(2u_{i1} - 1)\phi(\delta' z_i)}{\Phi(\{2u_{i1} - 1\}\delta' z_i)}$$

This regressor is included in the equation of interest, which is modelled by a dynamic random effects probit model, as suggested by Arulampalam (2000):

$$u_{it}^* = \theta u_{i,t-1}^* + \beta' x_{it} + \gamma \lambda_i + \alpha_i + e_{it}$$

The choice of this model allows explicit modelling of time invariant variables without eliminating them by a procedure such as the fixed effects or first differencing transformation. Furthermore, should the dependent variable be persistent (which is central to the hypothesis), a fixed effects transformation will result in very similar outcomes for persistent successes and failures<sup>2</sup>.

The test for the significance of initial conditions is the usual T-test on  $\gamma$ . The scarring effect can only be tested with one lagged dependent variable; a more extensive lag structure limits the sample size<sup>3</sup>, owing to the short length of the panel. Results can therefore only reveal short-term scarring effects and remain silent on long-term effects.

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<sup>1</sup> In this application, age in its continuous form alongside race and provincial dummies are included (though the latter are not strictly exogenous as a result of possible migration to provinces with lower unemployment). Results are omitted here, though all variables are statistically significant at the 5% level. It is important to note here that few suitable variables in the current panel data exist which can be included in this initial equation which are not relevant in explaining the outcome in the equation of interest.

<sup>2</sup> Consider two extremes. Should a person be unemployed in each period under consideration ( $u_{it}=1$ ), the mean over time is also 1, and consequently each time-demeaned value will be 0. Similarly, for  $u_{it}=0$ , the mean is 0 and each time-demeaned value is also 0.

<sup>3</sup> The question under consideration already limits the sample size considerably, so that further restrictions will entail that a severe case of sample selection bias may result (an issue which cannot be adequately addressed without satisfactory exclusion restrictions in the data). For instance, it is already necessary to include only individuals who are economically active in the first wave, as information on initial conditions is required. Despite entry into the labour market later in the panel, information pertaining to these individuals cannot be included in a viable fashion. The rotating nature of the panel builds systematic attrition into the dataset from the outset; this adds to attrition which results from

$\beta$  includes dummies for various age categories, as well as their interactions with the lag dependent. The age dummies in their linear form attempt to capture life-cycle effects on unemployment. The interaction variables are the focus of this study, as it is important to establish whether younger individuals are more prone to scarring than older individuals.

## 6.2 Results

Figure 1 provides descriptive evidence of scarring in South Africa. Transition probabilities reveal that the youngest cohorts are most prone to stay unemployed if unemployed in the previous period, while this persistence declines for older cohorts<sup>4</sup>. For all cohorts this inertia declines somewhat from September 2002 to March 2004 (except for the spike for the oldest cohort in LFS 2003b, which may be the product of measurement error or reveal a selectivity problem). This suggests that the labour market could possibly be becoming more fluid and returning to lower levels of inertia, (as witnessed in LFS2002a), though these changes are small and slow.

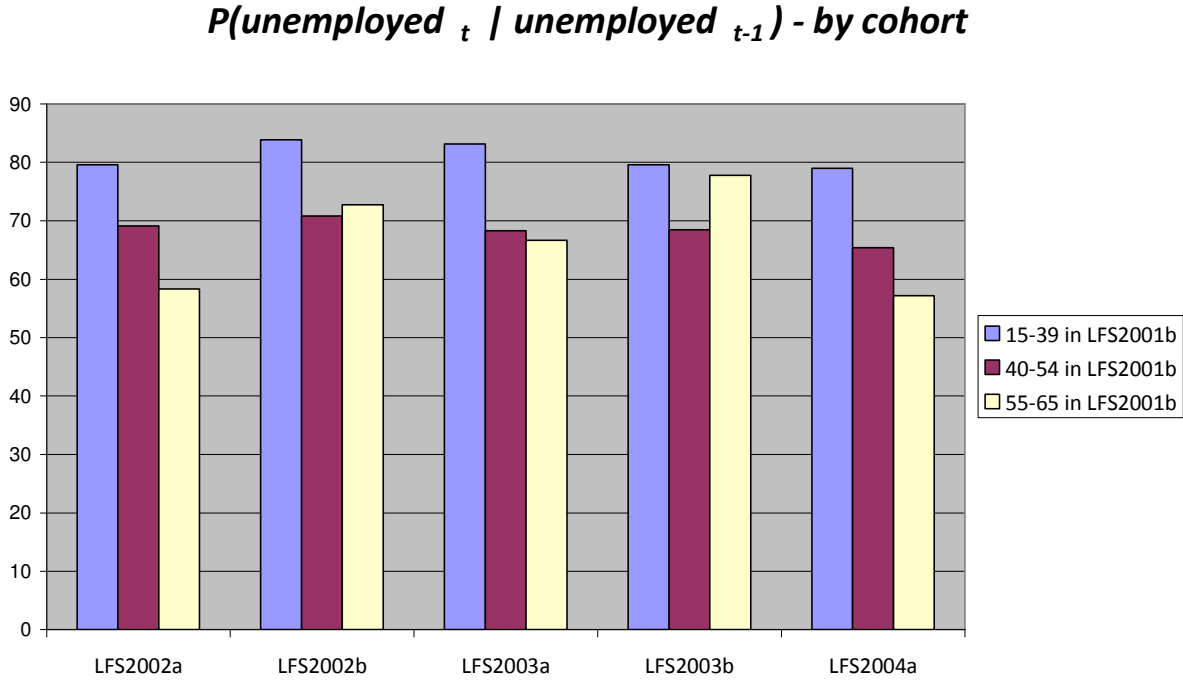
Table 1 presents the results of the econometric models. It is evident that the need for the initial condition correction is statistically relevant. Both versions of the model establish a statistically significant (at 1%) overall scarring effect, with a positive coefficient on the lag of unemployment.

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migration and response fatigue at re-interviews. Arulampalam et. al. (2000) furthermore omit individuals from later waves if one period of data is unavailable, even if they re-enter the panel. This latter consideration isn't explicitly taken into account in this paper. Nevertheless, the number of unique individuals traced over time given these restrictions is reduced to only 3259, and appear on average in 4 of the 6 panels, with on average only 3 lags available per individual over the period.

<sup>4</sup> Here cohorts (in other words, those born in a specific year) are used instead of age categories. The broadness of the categories and the short time series makes these concepts virtually interchangeable in this context. Full analyses over a long period would be stronger if *cohorts* are followed rather than considering age groups in each survey, as the birth year is also indicative of the time of labour market entry: it is this initial effect which determines any future scarring.

Figure 1 Transition probabilities by cohort

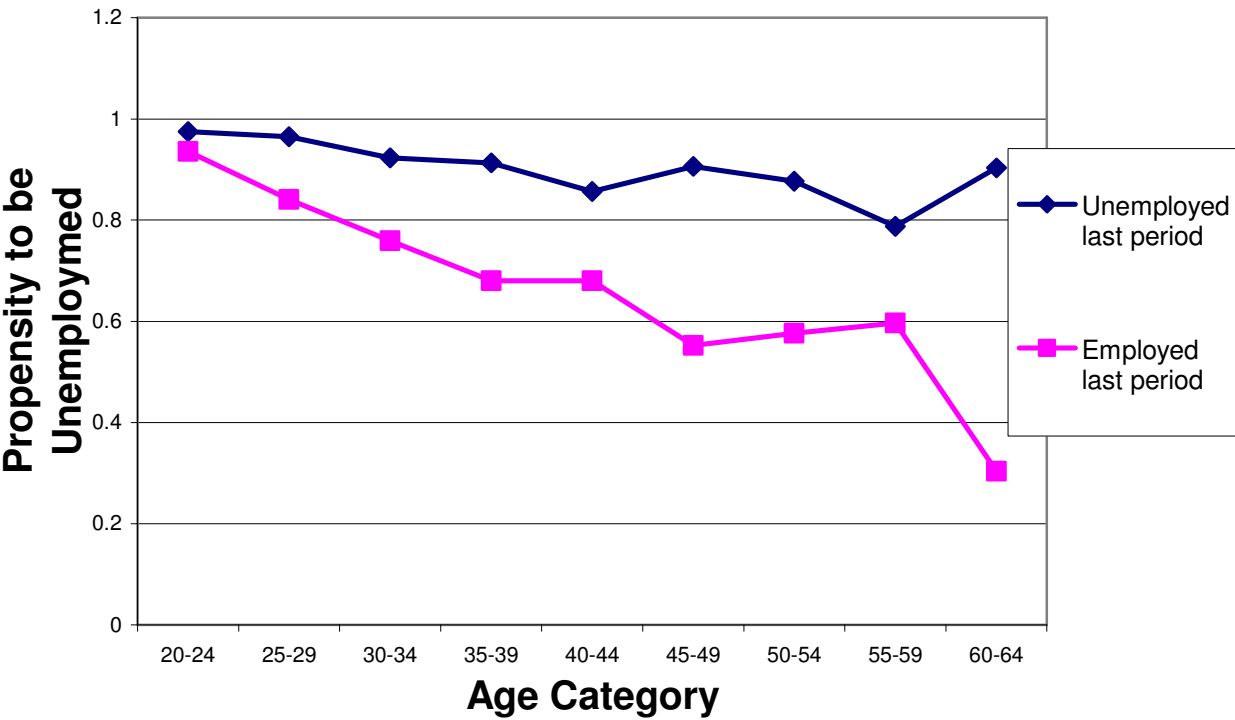


Column 1 specifies the age dummies together with the relevant interactions with lagged unemployment. Life cycle effects can be traced by considering the signs and magnitudes of the age dummies: at young ages, the probability of unemployment is high, but declines for every subsequent age category (though from the 50-54 category a reversal occurs). The coefficients are, however, insignificant, except for the youngest and oldest categories. In contrast, most of the age interactions are statistically significant. The coefficients apparently do not reveal what is expected: the large negative coefficient for the youngest age category suggests that the overall effect of scarring is least severe at this age (if the insignificant life-cycle effects are ignored). This “advantage” generally declines with age, though between the ages of 50 and 60 it appears again. It is evident that the life-cycle disadvantage is offset by a “non-persistence advantage” for each higher age category. This is contrary to the descriptive evidence presented above.

Figure 2, however, clarifies this scenario and plots the predicted propensities (based on the model) to be unemployed for those (un)employed in the previous wave according to age category. It is evident that for the “control group” (those recently employed), that a clear life-cycle effect can be traced, with a steady decline in the propensity for unemployment as individuals age. The “treatment group” (those recently unemployed) - where we should trace the effect of scarring - experiences a slight decline in unemployment propensities with age. It is evident that the life-cycle advantage which

accords to the control group is halted by scarring, and particularly so for the youngest groups, where the decline is slowest.

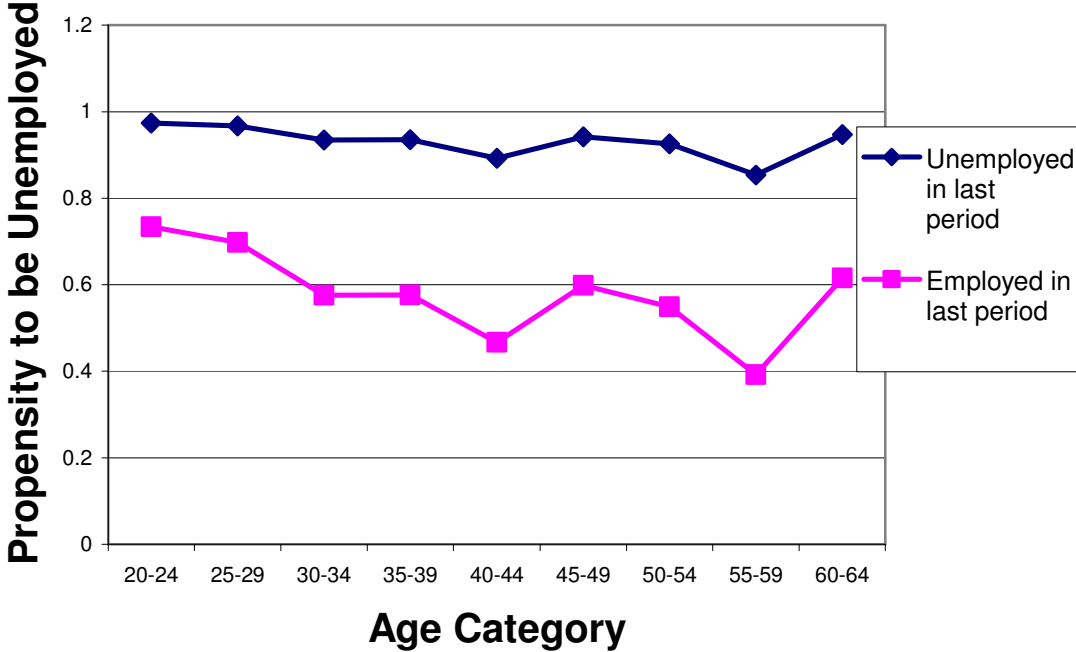
Figure 2 Propensity to be employed (Black male matriculants) - Model 1



The model was re-estimated without the insignificant age dummies (column 2). It now becomes clearer within the model that the disadvantage of past unemployment declines with age. This confirms the scenario evident in

Figure 2. While the coefficients are more intuitive in the second model, Figure 3 shows a less pronounced “youth” scarring effect, with a much the slower decline in unemployment propensities with age relative to older individuals. The differences between the previously employed and unemployed are, however, much larger at all ages. The fuller model remains the more conclusive of the two, though interpretation is complicated by the high dependence between age and persistence, which is revealed in the descriptive evidence.

Figure 3 Propensity to be employed (Black male matriculants) – Model 2



## 7 Conclusions

Unemployment is a peril in a society where poverty pervades many communities. Yet, the broader disutility associated with this evil suggests that scars related to unemployment stretch beyond a lack of income autonomy. The further individuals are removed from the labour market (geographically, in skill and in human contact), the greater their misperceptions concerning their prospects of finding a job. In a world of perfect information, the job search process would be smooth, with participants expecting a realistic wage from the “right” employer willing to make an acceptable offer. Particularly the value that potential entrants attach to their human capital could be distorted by failing to account for practical experience which their counterparts in the labour market may already possess. It may be necessary for entrants to exploit menial jobs as a stepping stone at an early age to develop tacit knowledge and better perceptions of requirements and dynamics of the job market. Household composition and connections to insiders also plays an important role. Successful entry requires more than an educational qualification and a job advertisement; “inside knowledge” should be developed, to be able to gauge the ups, downs and unwritten stipulations of the labour market. Successfully obtaining this tacit knowledge entails early and close connection with insiders. High educational attainment among younger generations of South Africans and possible political optimism may have (falsely) signalled the start of low

youth unemployment for the previously disadvantaged. However, it appears that absorption rates have not matched these expectations and that the potential for this disequilibrium to have persistent effects is a worrying feature of the South African labour market.

The empirical evidence presented from the LFS panel suggests that scarring is prominent across the entire life cycle, with higher unemployment propensities resulting from unemployment in the past period. For the youth, unemployment is high regardless of previous status, though the decline over the life cycle is substantially slower for those unemployed in the last period. While these results could benefit from a longer time series and more suitable exclusion restrictions, they are indicative of the short-term inertia faced by all recently unemployed South Africans, but in particular the youth.

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## 9 Appendix

**Table 1 Dynamic Random Effects Probit Models of Broad Unemployment (Source: LFS Panel)**

		-1	-2
		<b>Broad Unemployment</b>	
<i>Unemployment (t-1)</i>		1.476 (4.77)**	1.324 (5.78)**
<i>Unemployment (t-1) x Age Category</i>	20-24	-1.041 (3.08)**	-0.115 (0.48)
	25-29	-0.665 (2.04)*	-0.222 (0.93)
	30-34	-0.753 (2.31)*	-0.548 (2.28)*
	35-39	-0.582 (1.78)	-0.546 (2.23)*
	40-44	-0.88 (2.68)**	-0.822 (3.34)**
	45-49	-0.289 (0.85)	-0.489 (1.9)
	50-54	-0.512 (1.43)	-0.616 (2.19)*
	55-59	-0.924 (2.31)*	-1.013 (3.09)**
	60-64	0.337 (0.52)	-0.446 (0.81)
<i>Age Category</i>	20-24	1.057 (3.91)**	
	25-29	0.532 (2.06)*	
	30-34	0.237 (0.93)	
	35-39	0.002 (0.01)	
	40-44	0.003 (0.01)	
	45-49	-0.333 (1.28)	
	50-54	-0.272 (1.03)	
	55-59	-0.221 (0.80)	
60-64	-0.98 (2.48)*		

	-1	-2
	<b>Broad Unemployment</b>	
<i>Primary Education</i>	0.214 (1.65)	0.289 (2.20)*
<i>Incomplete Secondary Education</i>	0.261 (2.09)*	0.46 (3.65)**
<i>Matriculation</i>	0.348 (2.54)*	0.6 (4.34)**
<i>Tertiary Education</i>	-0.241 (1.49)	-0.055 (0.34)
<i>Coloured</i>	-0.556 (6.81)**	-0.498 (6.07)**
<i>Indian</i>	-0.923 (4.21)**	-0.936 (4.22)**
<i>White</i>	-1.097 (7.98)**	-1.223 (8.70)**
<i>Female</i>	0.252 (4.56)**	0.266 (4.77)**
<i>Correction Term</i>	0.991 (15.45)**	1.075 (15.65)**
<i>Constant</i>	-0.873 (3.24)**	-0.935 (7.39)**
<i>Observations</i>	9683	9683
<i>Number of Unique Person Identifiers</i>	3259	3259

Absolute value of z statistics in parentheses

\* significant at 5%; \*\* significant at 1%