South African labour market transitions since the global financial and economic crisis:
Evidence from two longitudinal datasets

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Abstract

This paper studies individual labour market mobility and its determinants in South Africa since 2008, using two large, nationally representative longitudinal datasets: a set of two-year panels based on the National Income Dynamics Study (NIDS) and quarter-to-quarter matched Quarterly Labour Force Survey (QLFS) cross-sections. We find considerable mobility in the South African labour market, with men and women transitioning in and out of employment and between different forms of employment and non-employment, both in the short and medium run. Our econometric analysis shows that at least part of this mobility is explained by demand-side factors outside of individuals' direct control. Matric or post-matric level education and, to some extent, older age increased workers' job security, above and beyond the influence of other, job-related variables. Higher education also helped individuals find jobs, independent of their initial labour market status and earlier work experience. On the whole, our findings suggests that in South Africa labour market segmentation manifests itself through selective rather than indiscriminate rigidities: higher-educated and/or more experienced labour market participants more easily break through the barriers to entry into the most valued jobs and, once there, benefit more from downward rigidity in the labour market than others. We further show how, following the global financial and economic crisis, short-term labour market mobility gradually decreased and segmentation became somewhat less selective on the level of education.

1. Introduction

Developing country labour markets typically consist of multiple segments that embody qualitatively different types of employment (Fields, 2007). In Sub-Saharan Africa formal wage jobs are often thought to be severely rationed, due to limited labour demand in the formal sector and a fast-growing labour force. Surplus labour is absorbed by a large informal sector dominated by small household farms and enterprises (De Vreyer and Roubaud, 2013; Stampini *et al.*, 2013; Golub and Hayat, 2015). Ideally, labour market segmentation and (the lack of) movement between segments are studied using individual-level panel data. Such data is however unavailable or of poor quality for most Sub-Saharan African countries (Fox *et al.*, 2013; Fox and Pimhidzai, 2013). Existing Ghanaian, Tanzanian and Ethiopian panel data are ill-suited for an in-depth analysis of labour market dynamics due to small samples, large panel attrition and a narrow focus on urban centres (Sandefur *et al.*, 2007; Quinn and Teal, 2008; Falco *et al.*, 2011; Falco and Haywood, 2016). This paper uses two large, nationally representative longitudinal datasets from South Africa to study individual labour market mobility and its determinants since 2008: first, a set of two-year panels based on the National Income Dynamics Study (NIDS); and second, quarter-to-quarter matched Quarterly Labour Force Survey (QLFS) cross-sections.

South Africa makes an interesting case to investigate labour market mobility and segmentation. Among developing countries South Africa is an outlier in terms of limited informal sector employment and structurally high unemployment (Kingdon and Knight, 2009; Fox *et al.*, 2013). Similar to other African economies its formal sector suffers from labour demand-supply mismatches (Bhorat and Hodge, 1999; Rodrik, 2008; Bhorat *et al.*, 2014). But due to various barriers to informal sector entry (including legacies from apartheid) these mismatches have translated into open unemployment more than underemployment (Kingdon and Knight, 2004; Banerjee *et al.*, 2008). The South African labour market also possesses other features that are deemed to render it comparatively rigid, including strong unionisation and collective bargaining, high minimum wages and strict hiring/firing regulations (Fedderke, 2012; Magruder, 2012).[1] Therefore, Kingdon and Knight (2009) have described the South African labour market's main segmentation as one between 'insiders', formal sector

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[1] The contribution of these factors to labour market rigidity (and, ultimately, unemployment) remains actively debated. For example, estimates of the wage premia associated with union membership and bargaining council coverage tend to vary widely (Hofmeyr and Lucas, 2001; Bhorat *et al.*, 2012; Magruder, 2012). For a broader review and meta-analysis of the debates surrounding South African unemployment, see Fourie (2012).

employees with well-protected positions and wages, and 'outsiders', the unemployed and informal sector workers who lack most of the job benefits insiders enjoy.[2]

The first objective of this paper is to document the *extent* of South African labour market mobility, i.e., the prevalence of individuals switching between labour market statuses. Our second objective is to evaluate the *nature* of labour market segmentation (if any), i.e., whether certain groups of individuals are more/less likely to make labour market transitions. A large cross-sectional literature has demonstrated how different groups of South African labour market participants differ in terms of characteristics like gender, race, age, education and location. For example, studies like Dinkelman and Pirouz (2002), Kingdon and Knight (2004) and Dias and Posel (2007) show that the employed tend to be older, more educated, less likely to be Black Africans or Coloureds, and less likely to be living in the former homelands than the unemployed. Also stark differences between formal and informal sector workers have been noted (Kingdon and Knight, 2004; Devey *et al.*, 2008; Wills, 2009). Using the NIDS and matched QLFS allows us to adopt a more dynamic perspective and investigate econometrically which individual characteristics impact on the probability of *remaining in* or *finding* employment. In our analysis we concentrate on the role of age and education, proxies of work experience and skills. We assume that, in the presence of a set of control variables, any effects of age and education on job security or job finding will relate mostly to demand-side factors (linked to the broader economic environment or firms' hiring and firing strategies) rather than to deliberate individual or household choices.

A focus on the labour demand side seems particularly relevant for the post-2008, global financial and economic crisis period covered by our datasets. Because of its European links and driven by a fall in manufacturing output South Africa experienced a recession between 2008Q4 and 2009Q2 (Statistics South Africa, 2014a). Economic growth has been weak ever since, due to a combination of external and domestic factors (OECD, 2013; IMF, 2014). The reaction of the South African labour market to the crisis was pronounced and long-lasting. Total employment decreased from a peak of 14.8 million in 2008Q4 to a trough of 13.6 million in 2010Q3. End 2013 total employment stood at 15.2 million. The ranks of the searching unemployed swelled from 4 to 4.8 million over 2008Q4-2013Q4 and of the broadly defined unemployed (including discouraged individuals that preferred to work but had given up job search) from 5.2 to 7 million (see Figure A1 in Appendix). As a result, South Africa's official, narrowly defined unemployment rate increased from an average of 22.5% in 2008 to

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[2] Like in other African countries (Günther and Launov, 2012; Falco *et al.*, 2015), the (small) informal segment of the South African labour market may consist of various subsegments (Heintz and Posel, 2008).

24.7% in 2013; the broad unemployment rate rose from 27% to 32.7%. Table A1 in Appendix shows how the 2008-2013 evolution in unemployment rates varied significantly across groups. Increases in broad unemployment rates were greatest for men, Black Africans and Coloureds, youth, the primary educated, and in rural areas. Our longitudinal datasets help us to investigate the *gross* changes in individual labour market participation that lie beneath these aggregate, netted-out trends.

The paper's specific contributions over previous studies using the NIDS (Cichello *et al.*, 2014; Posel *et al.*, 2014; Ranchhod, 2013) or the matched QLFS (von Fintel and Burger, 2009; Verick, 2012; Leung *et al.*, 2014) are threefold.[3] First, unlike any of the above, we consider both medium-term labour market mobility in the NIDS and short-run mobility in the QLFS and construct mobility measures that can be decomposed into 'upward', 'downward' and 'within' components. This enables us to draw a more nuanced picture of the extent of South African labour market mobility. Second, relative to other studies we attempt to distinguish more clearly between demand-side and supply-side (choice) determinants of remaining in or finding employment, to get a better grip of the nature of labour market segmentation in South Africa. Verick (2012) and Leung *et al.* (2014) both find that age and education correlate positively with the probability of being employed in the QLFS, but do not separate job exit from job entry. We extend their work by controlling for a large range of confounding factors in the relation between age/education and job security/finding. Similarly, Cichello *et al.* (2014) and Posel *et al.* (2014) hint at positive experience- and skill-related effects on labour market transitions in the NIDS; but the first study is limited to the Black African subsample, whereas the latter looks only into the drivers of job finding. Third, we adopt a much longer post-crisis timeframe by incorporating the third wave of the NIDS (unlike Cichello *et al.*, 2014; Posel *et al.*, 2014) and extending our own carefully matched QLFS dataset up to end 2013 (unlike von Fintel and Burger, 2009; Verick, 2012; Leung *et al.*, 2014, whose panels cover only 2008-2009).[4] Hence, we can examine potential changes in labour market mobility and in the relationship between age/education and job security/finding during and after the zenith of the global crisis.

To preview our main results, we find considerable mobility in the South African labour market, both in the short and medium run. With respect to the nature of labour market

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[3] Other panel datasets on the South African labour market exist but are either outdated, such as the old Labour Force Survey (LFS) panel (Banerjee *et al.*, 2008; Ranchhod and Dinkelman, 2008), and/or limited in their geographical scope, such as the KwaZulu-Natal Income Dynamics Study (KIDS) (Dinkelman, 2004; Cichello *et al.*, 2005) and the Cape Area Panel Study (CAPS) (Lam et al., 2009).

[4] Ranchhod (2013) considers a three-wave balanced NIDS panel but does not attempt a multivariate analysis.

segmentation our econometric estimates show that at least part of it is explained by demand-side factors outside of individuals' direct control. Matric or post-matric level education and, to some extent, older age increased workers' job security, above and beyond the influence of other, job-related variables. Higher education also helped individuals find jobs, independent of their initial labour market status and earlier work experience. On the whole, the evidence suggests that in South Africa labour market segmentation manifests itself through selective rather than indiscriminate rigidities: higher-educated and/or more experienced labour market participants more easily break through the barriers to entry into the most valued jobs and, once there, benefit more from downward rigidity in the labour market. We further show how, following the global crisis, short-term labour market mobility gradually decreased and segmentation became somewhat less selective on the level of education.

The remainder of the paper is structured as follows. Section 2 first describes the NIDS and QLFS datasets and then examines labour market mobility by means of transition matrices and decomposable summary measures. The set-up of our econometric models of labour market transitions is explained in Section 3. Section 4 discusses the NIDS and QLFS model estimates. Section 5 concludes.

2. Datasets and descriptive statistics

2.1. National Income Dynamics Study (NIDS)

The NIDS is South Africa's first nationally representative panel data survey that tracks individuals even if they move residence and collects detailed information on labour market participation.[5] It is implemented by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town and currently consists of three waves. Wave 1 was collected between January and December 2008 (mostly before the South African recession), with a baseline of 26,776 individual-level interviews; wave 2 was organised from May 2010 to September 2011 (when economic recovery had set in, but the labour market situation was still deteriorating; see Table A1); and wave 3 between April and December 2012 (when overall unemployment rates had more or less stabilised).[6] We construct two separate panels from the NIDS by linking wave 1 with wave 2 and wave 2 with wave 3. Following Cichello *et al.* (2014) we keep only adults aged 20 to 55 in the first wave of each of

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[5] For a more elaborate overview of the NIDS we refer to de Villiers *et al.* (2013) and http://www.nids.uct.ac.za.
[6] 92% of all wave 1 interviews were conducted between February and June 2008. We refer to wave 2 of the NIDS as year 2010 in the rest of the paper. 80% of wave 2 interviews took place in 2010.

the panels.[7] Within the NIDS the employed include those that are paid a wage or salary to work on a regular basis for an employer (regular wage employment); work for themselves, including in partnership (self-employment); work on an irregular and short-term basis (casual employment); work on the household's own plot or food garden (subsistence agriculture); or assist others with their businesses.[8] The searching unemployed had actively searched for work in the four weeks prior to interview, whereas the discouraged unemployed had not. Lastly, the not economically active (NEA) are outside the labour force (for example, full-time students, the sick and disabled, those that fulfil unpaid domestic duties). Dropping individuals outside the imposed age limits or with missing labour market status information leaves us with 7,303 wave 1-2 and 7,574 wave 2-3 panel members.

Both NIDS panels are non-random subsamples of the wave 1 and 2 cross-sections. Hence, the NIDS comes with weights that attempt to correct for between-wave attrition. These panel weights are obtained by multiplying cross-sectional weights (accounting for initial non-response and calibrating the sample to population estimates) with the inverse of next-wave re-interview probabilities (estimated using probit models). Table S1 in the Online Appendix presents the sample compositions of the NIDS cross-sections and panels and shows how the panel weights bring the panel samples in line with the (nationally representative) cross-sections. Our samples are predominantly Black African, urban and low-educated.[9]

2.2. Matched Quarterly Labour Force Survey (QLFS) cross-sections

The QLFS collects labour market information of individuals aged 15 and older and is the source of South Africa's official unemployment rate.[10] Replacing the semi-annual LFS since 2008, the QLFS is designed as a rotating panel of around 30,000 dwellings, 25% of which are refreshed each quarter. The QLFS does not explicitly track households over time; if one household moves out of a particular dwelling and another moves in, say, after two quarters, the new household will be enumerated for the remaining two quarters. Household identifiers are generally maintained across quarters but individual identifiers not necessarily so, which

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[7] The official working age in South Africa is 15-64, but because of our focus on demand-side factors in labour market transitions we do not want the results to be unduly influenced by school leavers or (soon-to-be) pensioners.

[8] Because of problems with capturing subsistence agriculture in wave 2 of the NIDS (Cichello *et al.*, 2014) and small sample sizes for casual employment and business assistance we pool together these three categories in our further analyses. Excluding individuals in subsistence agriculture altogether makes little difference to our results.

[9] Table S1 also reveals a large reduction in the proportion of the unemployed and a large increase in the share of the NEA between waves 1 and 2 (Cichello *et al.*, 2014). Finn and Ranchhod (2015) suggest that this may be the result of misclassifications of the non-employed in wave 2 by NIDS fieldworkers. Indeed, similar shifts cannot be found in the QLFS. We keep this in mind when specifying our empirical models in Section 3.

[10] See http://www.statssa.gov.za/qlfs/index.asp for more details about the QLFS.

further complicates using the QLFS as an individual-level longitudinal dataset. To get around these problems we use a matching algorithm similar to that of Ranchhod and Dinkelman (2008) for the LFS and applied to the QLFS by Verick (2012) and Leung *et al.* (2014). Individuals are matched from one quarter to the next using household identifiers, gender, race and age, with additional consistency checks on educational attainment and marital status to minimise false matches (see Table S2 in the Online Appendix). Applied to a total of 1,303,404 observations for working-age individuals in 24 quarters (2008Q1-2013Q4) the algorithm results in a pooled dataset of 952,158 observations matched between at least two quarters. This corresponds to an average matching rate of 72.1%.[11] As before, our samples are limited to those aged 20-55 in the first of every pair of quarters. We focus on the QLFS's five major labour market statuses: formal sector employment (based on company size and tax registration), informal sector employment, searching unemployed, discouraged unemployed and NEA. This classification is largely equivalent to that of the NIDS, although there is no one-to-one correspondence between formal sector and regular wage employment, and between informal sector jobs and self-, casual or other employment. Final sample sizes of the quarter-to-quarter panels range between 18,000 and 22,000.

Table S3 in the Online Appendix compares the sample compositions of QLFS cross-sections and quarter-to-quarter matched panels pooled over the years 2008 to 2013. The cross-sectional NIDS and QLFS are broadly similar, even if the proportions of women, Black Africans and rural households are somewhat lower in the latter than in the former. Quarter-to-quarter panel weights, constructed in a similar fashion as in the NIDS, again help to align QLFS panels with the original cross-sections.[12]

2.3. Labour market transition matrices and mobility decomposition

Table 1 presents the rates of transition between different labour market statuses for our two NIDS panels. In spite of a large literature emphasising South African labour market rigidities

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[11] Following Ranchhod and Dinkelman (2008, p.6) the average matching rate is calculated as the number of successful individual matches divided by the number of individuals in households that are common to two consecutive quarters (i.e., the theoretical maximum number of matches), averaged over all pairs of quarters.

[12] QLFS panel weights were calculated as the product of cross-sectional weights and the inverse of next-quarter match probabilities (predicted from probit models with age interval, race, gender, marital status, education, province and geography dummies as regressors), trimmed at the 1st and 99th percentiles. It should be noted that these panel weights do not solve the issue of non-random matching that is correlated with unobservables (Ranchhod and Dinkelman, 2008). Since in South Africa internal migration is often either a cause or consequence of changes in the labour market status (Klasen and Woolard, 2009; Ebrahim *et al.*, 2013), the absence in the matched QLFS data of individuals that change dwelling between quarters will lead us to underestimate labour market mobility. Conversely, any remaining false matches would imply an *over*estimation of mobility.

but in line with other longitudinal studies covering medium- or longer-term periods (Cichello *et al.*, 2005, 2014; Banerjee *et al.*, 2008), we observe considerable mobility. For example, more than 23% of those in regular wage jobs in 2008 (2010) were no longer so by 2010 (2012). More than 21% (18%) of the initially searching (discouraged) unemployed found wage employment over a span of two years. There is also sizeable movement from self-, casual and other employment into regular wage jobs over the two transition periods. Labour market segmentation thus seems far from absolute.

One way of summarising the information in Table 1 is the decomposition of overall mobility, i.e., the percentage of individuals changing labour market status between two waves, into 'upward', 'downward' and 'within' mobility components. Note that with the six labour market statuses of the NIDS total mobility can be written as:

$$m_{total} = \sum_{i=1}^{6} \sum_{j=1}^{6} s_i t_{ij \mid i \neq j}$$

where s_i is the ith element of the 6×1 vector S comprising the proportions of each labour market category in the initial wave, and t_{ij} is the element on the ith row and in the jth column of the 6×6 transition matrix T between waves, as depicted in Table 1. This expression is decomposable into:

$$m_{total} = \sum_{i=4}^{6} \sum_{j=1}^{3} s_i t_{ij} + \sum_{i=1}^{3} \sum_{j=4}^{6} s_i t_{ij} + \sum_{i=1}^{3} \sum_{j=1}^{3} s_i t_{ij \mid i \neq j} + \sum_{i=4}^{6} \sum_{j=4}^{6} s_i t_{ij \mid i \neq j}$$

$$= m_{upward} + m_{downward} + m_{within\ employment} + m_{within\ non-employment}$$

with upward mobility the mobility from different non-employment states into employment; downward mobility the transitions from employment into non-employment; and within (non-)employment mobility the movement between distinct forms of (non-)employment. Table A2 in Appendix lists the mobility measures and their decompositions for the full NIDS panel samples and for men and women separately. Between 2008 and 2010 downward mobility was somewhat larger than upward mobility. Over the post-crisis period, however, upward mobility trumped downward mobility. Mobility within non-employment, i.e., changes in job search decisions, accounted for a large part of overall mobility in both periods, especially for women. Overall medium-term mobility of all adults and of women was slightly higher between 2008 and 2010 than in the post-crisis period; the mobility of men increased. Given the relatively long time span between the waves of the NIDS we believe it is useful to complement the foregoing with evidence on shorter-term mobility from the matched QLFS.

Table 1: Transition matrices for labour market statuses (NIDS), 2008-2010 and 2010-2012: row proportions (%)

Pane (a)

		Labour market status in 2010					
		40.1	5.9	4.6	11.8	4.8	32.7
		Regular wage employ.	Self-employ.	Casual and other employ.	Unemploy. searching	Unemploy. disc.	NEA
37.2	Regular wage employment	**76.8**	3.1	3.2	4.9	2.6	9.4
7.4	Self-employment	16.6	**34.1**	5.4	7.7	2.7	33.5
8.3	Casual and other employment	24.4	6.3	**6.0**	11.9	5.8	45.6
18.1	Unemployed, searching	21.6	3.9	6.5	**21.8**	6.3	39.8
6.1	Unemployed, discouraged	18.1	3.3	6.7	18.2	**10.8**	42.9
23.0	NEA	14.3	3.5	4.0	14.8	5.9	**57.4**

Labour market status in 2008 (row label)

Pane (b)

		Labour market status in 2012					
		40.1	5.9	5.5	18.4	3.8	26.3
		Regular wage employ.	Self-employ.	Casual and other employ.	Unemploy. searching	Unemploy. disc.	NEA
37.0	Regular wage employment	**76.6**	2.3	3.2	8.4	1.1	8.4
5.6	Self-employment	18.4	**41.6**	4.1	11.1	3.2	21.6
5.1	Casual and other employment	31.4	8.0	**11.7**	17.8	4.6	26.5
12.9	Unemployed, searching	23.7	5.8	7.6	**30.1**	5.7	27.0
4.9	Unemployed, discouraged	18.6	3.7	7.3	25.4	**8.3**	36.8
34.5	NEA	14.7	4.1	6.1	25.2	5.5	**44.4**

Labour market status in 2010 (row label)

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).
Notes: These matrices show transition rates between different labour market statuses over 2008-2010 (pane (a)) and 2010-2012 (pane (b)). Each row sums to 100%. The samples include only panel members aged 20-55 in 2008 (pane (a)) or 2010 (pane (b)). The outer left column of pane (a) (pane (b)) gives the overall proportion of each labour market status in 2008 (2010). The top row of pane (a) (pane (b)) gives the overall proportion of each status in 2010 (2012). All figures are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and between-wave attrition.

Table 2: Transition matrices for labour market statuses (QLFS), 2008Q1-2013Q4: row proportions (%)

Labour market status in quarter t+1

		Formal sector employment						Informal sector employment						Unemployed, searching						Unemployed, discouraged						NEA					
		2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Labour market status in quarter t	Formal sector employ.	**91.0**	**92.0**	**92.5**	**92.6**	**92.6**	**92.1**	3.9	3.2	3.2	3.2	3.1	3.0	2.9	2.9	2.4	2.4	2.4	2.7	0.5	0.5	0.6	0.7	0.7	1.0	1.7	1.3	1.4	1.2	1.2	1.3
	Informal sector employ.	12.1	10.3	9.9	9.4	9.7	10.5	**74.1**	**76.9**	**79.4**	**79.8**	**78.8**	**77.2**	6.5	5.6	4.5	5.0	5.0	5.7	1.7	2.3	2.4	2.1	2.6	3.0	5.7	4.9	3.9	3.7	3.9	3.6
	Unemploy. searching	9.9	7.0	5.5	5.6	6.4	7.1	6.9	5.3	5.2	4.2	4.4	4.7	**62.0**	**65.5**	**68.4**	**69.4**	**70.0**	**70.3**	5.5	7.0	8.0	7.7	7.1	6.8	15.6	15.2	12.9	13.1	12.1	11.1
	Unemploy. discouraged	6.1	4.0	3.4	3.7	3.4	4.6	6.9	5.3	5.2	4.1	4.2	4.7	18.6	18.1	15.8	15.9	15.1	14.7	**44.2**	**51.1**	**56.1**	**58.0**	**60.2**	**58.2**	24.1	21.6	19.5	18.3	17.2	17.8
	NEA	2.8	1.8	1.9	1.9	1.9	2.3	3.5	2.7	2.1	1.9	2.0	2.3	10.6	9.7	9.1	9.0	8.8	9.3	4.2	5.3	6.4	6.7	6.2	6.4	**78.9**	**80.6**	**80.6**	**80.6**	**81.1**	**79.7**

Source: Own calculations using matched 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

Notes: This matrix shows quarter-to-quarter transition rates (Q1 to Q2, Q2 to Q3, and Q3 to Q4) between different labour market statuses, pooled per year over 2008-2013. Per year, each row sums to 100%. The samples include only matched individuals aged 20-55 in quarter t. All figures are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and attrition between quarters t and t+1.

Table 2 compiles quarter-to-quarter transition rates across the QLFS's five labour market statuses. Transitions from Q1 to Q2, Q2 to Q3 and Q3 to Q4 are pooled and compared over the years 2008 to 2013.[13] Also in the short run labour market statuses are far from stable and segmentation is not complete. On average 7-9% of workers initially in formal sector employment were no longer so in the next quarter; 7-10% (3-6%) of the searching (discouraged) unemployed moved into a formal sector job within one quarter; and 9-12% switched from informal to formal sector employment. Interestingly, labour market statuses became progressively more persistent during the recession (2009) and in its aftermath (2010-2012), with only a slight reversal in 2013. The decrease in mobility was bi-directional; both transitions from unemployment into employment and, to a lesser extent, from formal and informal sector employment to narrow unemployment became less prevalent. These trends confirm earlier claims by von Fintel and Burger (2009), Verick (2012) and Leung *et al.* (2014) that the net increases in unemployment rates following the recession (see Table A1) were driven more by reduced inflows into employment than by larger outflows.

Table A3 in Appendix presents labour market mobility measures similar to the ones calculated for the NIDS.[14] As before, we find that within non-employment mobility explained a large part of overall mobility, again especially for women. Table A3 shows the crisis and early post-crisis decline in overall quarter-to-quarter mobility and in its upward, downward and within employment components. More so than the NIDS, the matched QLFS suggests that labour market segmentation increased in the aftermath of the crisis. von Fintel and Burger (2009) argue that declining job creation and rising South African unemployment rates since 2008 were due to the relatively strong bargaining power of the formally employed. Wage bargains of those insiders may have reduced employers' willingness to create new vacancies for outsiders (foremost the unemployed). While we cannot test such assertions directly with our data, we will now shine further light on the *nature* of labour market segmentation.

3. Empirical model set-up

To evaluate which individual characteristics drive transitions in and out of employment we estimate simple probit models of the following form:

$$P(y = 1 \mid X, Z) = \Phi(X'\beta + Z'\delta)$$

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[13] Reassuringly, transition matrices reported by Statistics South Africa (2014b), based on a non-released QLFS panel matched using names, are very similar to ours. Differences in transition rates are virtually always smaller than one percentage point.

[14] Strictly speaking, the short-term QLFS and medium-term NIDS mobility measures are not comparable because of differences in employment definitions (regular wage vs. formal employment) and in the treatment of movers/migrants (which are tracked in the NIDS but excluded in the matched QLFS).

where y is a binary non-transition/transition indicator; Φ is the standard normal cumulative density function; X is a vector composed of experience-, skill-, and other job-related variables; and Z is a vector of control variables.[15] We estimate two sets of probit models, both first applied to the NIDS panels and then to the matched QLFS. In models of the first kind (Section 4.1) y takes the value one for individuals in the NIDS panels that are in regular wage employment in one wave (2008 or 2010) and again in the next wave (2010 or 2012), and the value zero for those no longer in regular wage jobs in the next wave. Similarly, in the matched QLFS y is assigned a value of one for individuals that remain in formal sector employment from one quarter to the next, and zero for those moving out of formal sector jobs. In the second set of models (Section 4.2) we assign to y a value of one for individuals that find regular wage employment (formal sector employment in the QLFS) in the next wave (quarter in the QLFS) and a value of zero for those that do not. We thus consider in turn the drivers of continued employment (lack of downward mobility) and the drivers of entry into employment (upward mobility). The focus on regular wage (or formal sector) jobs follows Cichello *et al.* (2014) and is motivated by the observation that such jobs generally provide more stability and other benefits, which makes them preferable over other employment.[16] We expect that exit from these 'most valued' jobs is less often a voluntary choice than transitions out of other employment, helping us to concentrate more on the role of external, demand-side factors. Contrasting wage/formal sector employment with the rest of the labour market also corresponds with the insider-outsider characterisation of segmentation by Kingdon and Knight (2009).

In our baseline specifications vector X includes age interval and educational attainment dummies as our main variables of interest. Age and education are observable elements of human capital, proxying experience and skills, that have featured prominently in related studies and the cross-sectional literature on South African labour markets (see Section 1). In other specifications we add extra job-related variables to X. In models of continued employment these include union membership, contract type/duration, occupation and industry dummies (in the NIDS panels), and firm type/size (in the QLFS panels). For the models of entry into employment entry we augment X with more explicit measures of work experience. The baseline controls in vector Z consist of race, marital status, household size, rural

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[15] Because of the likely misclassifications in wave 2 of the NIDS of some of the non-employed (see footnote 9), we choose not to use multinomial models that differentiate between different types of non-employment.

[16] The relative stability of wage/formal sector jobs is evident from the transition matrices in Tables 1 and 2. Moreover, Cichello *et al.* (2014) find that about two thirds of workers moving from wage jobs to self- or casual employment between 2008 and 2010 experienced losses in earnings, and that over 80% of those who made the opposite transition gained financially.

geography and province dummies. For all variables in X and Z we use baseline values from the initial wave (or quarter) of the transition under study. Because of gender differences in labour market mobility (Tables A2 and A3) separate models are estimated for men and women (aged 20 to 55 in the initial wave/quarter). As stated before, our premise is that in the presence of control variables Z the effects of age, education and job-related variables (X) on the likelihood of transitioning in or out of employment will be mostly related to demand-side factors, outside of the direct sphere of influence of individuals.[17]

Tables S4 and S5 in the Online Appendix describe the NIDS and QLFS subsamples of individuals initially employed in regular wage/formal sector jobs, i.e., the subjects of the first set of probits. Both men and women in these subsamples are less likely to be Black African and more likely to be prime-aged (26-45 years old), urban-based and higher-educated than in the corresponding full samples (Tables S1 and S3), in line with the cross-sectional snapshots by Kingdon and Knight (2004), Devey *et al.* (2008) and others.[18] Panel attrition is again non-random in the various NIDS and QLFS subsamples, but when the earlier-described panel weights are applied the compositions of cross-sections and panels are always roughly similar.

4. Model estimates and discussion[19]

4.1. Drivers of continued regular wage / formal sector employment

Table 3 displays the estimation results for probit models of continued regular wage employment, based on the NIDS panels and using panel weights. We report average marginal effects: each parameter should be read as the weighted average percentage point difference in the predicted probability of wage employment in the next wave between the group of individuals in question and the reference group (in brackets), conditional on initial wage employment and holding all other regressors at their sample values. Significance is based on standard errors adjusted for the NIDS survey design. All estimations include control vector Z (marginal effects not shown).

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[17] However, we do not pretend to be able to fully separate and identify the effects related to external factors, on the one hand, and those of individual or household choice, on the other hand.

[18] The NIDS and QLFS subsamples of individuals that are initially outside of wage/formal sector employment, subjects of the second set of probits, are described in Tables S6 and S7 in the Online Appendix. By construction, these subsamples form the complement to those of Tables S4 and S5.

[19] For reasons of brevity we do not report all estimation results discussed. All unreported results are available upon request.

Table 3: Probit estimates for continued regular wage employment (NIDS), 2008-2010 and 2010-2012: average marginal effects

	(M1a)	(M2a)	(M1b)	(M2b)	(F1a)	(F2a)	(F1b)	(F2b)
	Male	Male	Male	Male	Female	Female	Female	Female
	2008-2010	2008-2010	2010-2012	2010-2012	2008-2010	2008-2010	2010-2012	2010-2012
Age 26-35 (*ref: age 20-25*)	0.0904	0.1054	0.0206	-0.0050	0.0553	0.0381	0.1122**	0.0872*
Age 36-45	0.1518**	0.1445**	0.0634	0.0017	0.0777	0.0765	0.1778***	0.1298**
Age 46-55	0.1380	0.1165	0.0445	-0.0518	0.0467	0.0621	0.1755***	0.0856
Primary education (*ref: none*)	-0.0809*	-0.0539	0.1009*	0.0696	0.0225	-0.0149	0.0770	-0.0326
Secondary education	0.0343	0.0736	0.1702***	0.1314**	0.1638***	0.0615	0.1900***	0.0153
Tertiary education	0.0570	0.0424	0.1130	0.0452	0.2810***	0.1687**	0.2339***	0.0034
Union member		0.0233		0.1363***		0.0314		0.1426***
Written contract		0.0146		0.0258		-0.0160		0.0282
Permanent contract		0.0814*		0.1063**		0.0734*		0.0993***
Semi-skilled *(ref: elementary)*		-0.0213		-0.0404		0.0353		0.0488
Managerial/professional		-0.0414		-0.0415		0.0439		0.0304
Mining *(ref: agriculture)*		-0.1525*		-0.0493		0.1677***		
Manufacturing		-0.0550		-0.1330**		-0.0689		-0.0863
Utilities		0.1019***		-0.2112*				
Construction		-0.2675***		-0.2402***		-0.0111		-0.2359
Trade		-0.2068***		-0.1427***		0.0013		-0.0318
Transport		-0.0770		-0.2194**		-0.1328		-0.3177**
Financial services		-0.0539		-0.1874**		0.0312		-0.0028
Community services		-0.0833		-0.0616		-0.0195		0.1137*
N	1,143	969	1,151	982	1,212	874	1,286	971

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows average marginal effects based on binary probit regressions where the dependent variable takes value 1for individuals that were in regular wage employment both in the initial and next wave, and value 0 for those no longer in regular wage employment in the next wave. The samples include only male/female panel members that were aged 20-55 and in regular wage employment in the initial wave. All regressions are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and between-wave attrition. All models include as extra controls race dummies, a dummy for being married, household size, a rural geography dummy and province dummies (marginal effects not shown). Significance is based on survey design-adjusted standard errors. Significance levels: ***1% **5% *10%.

Columns (M1a)-(M1b) and (F1a)-(F1b) of Table 3 indicate that especially mid-aged men and women had higher chances of continued regular wage employment, although the differences with the reference group of 20-25 year-olds are not always significant. Completed secondary education (a matric or equivalent certificate) or tertiary (post-matric) education seems to have protected women and, to a lesser extent, men from transitioning out of regular wage jobs. These results corroborate those of Leung *et al.* (2014), who find that human capital provided a buffer against the external shocks of the crisis (see also Cichello *et al.*, 2014 on Black Africans only). The unreported marginal effects of the control variables indicate that being married had a positive influence and household size a (small) negative influence on the likelihood of staying wage employed, most significantly so for men. This illustrates the importance of individual/household choice, next to external factors, in determining labour market mobility. We do not find evidence of any significant racial effects, although estimates for the small subcategories of Whites and Asians (due to limited cross-sectional subsamples and high attrition rates in the NIDS) cannot be taken as representative.[20]

In columns (M2a)-(M2b) and (F2a)-(F2b) we add to the baseline specifications dummies for union membership, contract type and duration, occupation types and the industry of employment. Working under a permanent contract and union membership are positively correlated with remaining wage employed. Broad, skill-based occupation categories, as classified by Cichello *et al.* (2014), do not seem to have much of an additional influence. In both periods almost all sectors underperformed in terms of job security relative to agriculture.[21] Men active in the construction and trade sectors in 2008 were significantly less likely to still be in wage employment in 2010. This makes sense in view of the large net job losses in these sectors observed in the official (QLFS) cross-sectional data. What is puzzling, however, is the insignificance of the dummy for manufacturing over the 2008-2010 period, given that the sector accounted for the largest net (male) job losses between 2008Q4 and 2010Q3.[22] It is possible that the NIDS subsample sizes are simply too small and the NIDS waves too long and too far away from one another to pick up particular industry effects.

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[20] Including additional household characteristics, such as the presence of one or more other wage workers in the household (Dinkelman, 2004), of a pensioner receiving an Old Age Pension (OAP), or the number of children younger than six (Cichello *et al.*, 2014), leaves the marginal effects of age and education practically unchanged; as does the inclusion of interview quarter dummies.

[21] The positive marginal effects of the utilities sector for men and mining for women are based on very few observations.

[22] Perhaps workers in manufacturing had overall more transferable skills than, say, construction workers, which would give them an advantage in reallocating to other wage jobs (possibly in another sector or subsector) when made redundant. The public NIDS data does not allow for an investigation of within-manufacturing heterogeneity in job security or within-sector reallocation.

Between 2010 and 2012 we observe higher probabilities of continued regular wage employment for women active in community services (dominated by public sector jobs). Interestingly, most marginal effects of age and higher education that were found to be significant in the baseline models retain this significance even in the presence of a large set of job-related variables. Notable exceptions are the age effects of men and the education effects of women in the post-crisis period. Notwithstanding those exceptions our estimates so far suggest that higher-educated and/or more experienced workers are more likely to be part of the labour market insiders that enjoy job security (Kingdon and Knight, 2009).[23]

As alluded to above, the NIDS panels have their limitations, mostly in terms of the two-year(-plus) time span between waves, which hides shorter-term labour market churning, and the limited size of certain subsamples. Our matched QLFS data may not be perfect either, due to their omission of individuals changing dwelling. But the larger and higher-frequency QLFS panels help to put the NIDS results into perspective and to study variations over time in the economic significance of the main drivers of job security.

Table 4 reports average marginal effects estimated from probit models of continued formal sector employment in the QLFS panels, with quarterly transitions pooled per year. Columns (M1a)-(M1f) and (F1a)-(F1f) show highly significant positive correlations of age and secondary and tertiary education with sustained formal sector employment for both sexes, in line with NIDS-based Table 3 and Leung *et al.* (2014). As in the NIDS, education effects are particularly strong for women, mirroring the findings of Verick (2012) (based on QLFS cross-sections rather than panels). Unreported marginal effects again point to positive associations of continued employment with being married (for men) and negative associations with household size. Unlike in the NIDS estimations, where subsamples were too small to trust the marginal effects, we do find some significant racial differences in staying formally employed in the QLFS, most clearly between White and Black men.[24]

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[23] In unreported estimations we have augmented the baseline specifications with measures of job tenure, i.e., the log of the number of months an individual was employed in his/her wage job prior to interview, and initial wage earnings, i.e., the log of real monthly take-home pay (deflated to December 2012 price levels). Both variables turn out to be highly significant in explaining male and female job security. The inclusion of job tenure reduces markedly the economic and statistical significance of the age dummies and the inclusion of monthly pay the significance of the education dummies, since age and job tenure, and education and wage earnings are obviously collinear.

[24] Like in the NIDS, including extra household composition variables has little influence on the marginal effects of age and educational attainment.

Table 4: Probit estimates for continued formal sector employment (QLFS), 2008-2010 and 2010-2012: average marginal effects

	(M1a)	(M1b)	(M1c)	(M1d)	(M1e)	(M1f)	(M2a)	(M2b)	(M2c)	(M2d)	(M2e)	(M2f)
	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Age 26-35 (*ref: age 20-25*)	0.0184**	0.0145	0.0299***	0.0283***	0.0386***	0.0495***	0.005	0.0078	0.0211**	0.0151	0.0274***	0.0351***
Age 36-45	0.0402***	0.0267***	0.0570***	0.0406***	0.0508***	0.0572***	0.0221**	0.0132	0.0409***	0.0204**	0.0325***	0.0349***
Age 46-55	0.0426***	0.0390***	0.0520***	0.0489***	0.0527***	0.0501***	0.0192*	0.0207**	0.0312***	0.0240**	0.0305***	0.0234**
Primary education (*ref: none*)	0.0259**	0.0011	0.0215*	0.0065	0.0091	0.0040	0.0132	-0.0074	0.0068	-0.0030	0.0081	-0.0025
Secondary education	0.0764***	0.0461***	0.0631***	0.0416***	0.0504***	0.0483***	0.0405***	0.0182*	0.0305***	0.0053	0.0300**	0.0163
Tertiary education	0.1055***	0.0818***	0.0881***	0.0819***	0.0825***	0.0821***	0.0641***	0.0511***	0.0497***	0.0410***	0.0550***	0.0375***
Union member										0.0321***	0.0186***	0.0288***
Written contract							0.0295***	0.0215**	0.0334***	0.0195**	0.0337***	0.0369***
Permanent contract							0.0554***	0.0563***	0.0525***	0.0460***	0.0459***	0.0553***
Semi-skilled (*ref: elementary*)							-0.0013	0.0284***	0.0184**	0.0312***	0.0149**	0.0268***
Managerial/professional							0.0232**	0.0309***	0.0357***	0.0607***	0.0247**	0.0501***
Mining (*ref: agriculture*)							0.0181	-0.0196	0.0177	-0.0357**	-0.0300**	-0.0225
Manufacturing							-0.0056	-0.0344***	-0.0223**	-0.0360***	-0.0325***	-0.0430***
Utilities							-0.0276	-0.0310	-0.0558*	-0.0346	-0.0403	-0.0172
Construction							-0.0435***	-0.0522***	-0.0514***	-0.0628***	-0.0627***	-0.0648***
Trade							-0.0151	-0.0239**	-0.0173*	-0.0328***	-0.0355***	-0.0400***
Transport							-0.0242*	-0.0354***	-0.0373***	-0.0539***	-0.0418***	-0.0421***
Financial services							-0.0305**	-0.0340***	-0.0252**	-0.0309***	-0.0287***	-0.0476***
Community services							-0.0088	-0.0409***	-0.0347***	-0.0461***	-0.0284**	-0.0265**
Government/government-controlled (*ref: private enterprise*)							0.0273***	0.0341***	0.0296***	0.0257***	0.0133	0.0002
Non-profit							-0.0247	-0.0112	-0.0509*	-0.0063	-0.0039	-0.0061
Between 10 and 50 employees (*ref: less than 10 employees*)							0.0557***	0.0487***	0.0469***	0.0484***	0.0394***	0.0374***
50 or more employees							0.0677***	0.0700***	0.0566***	0.0624***	0.0421***	0.0492***
N	12,380	12,594	12,561	11,671	12,713	12,948	12,102	12,360	12,231	11,140	12,116	12,283

Table 4 (Continued)

	(F1a)	(F1b)	(F1c)	(F1d)	(F1e)	(F1f)	(F2a)	(F2b)	(F2c)	(F2d)	(F2e)	(F2f)
	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Age 26-35 (*ref: age 20-25*)	0.0459***	0.0498***	0.0202*	0.0490***	0.0307**	0.0451***	0.0257**	0.0234**	0.0059	0.0330***	0.0173*	0.0208*
Age 36-45	0.0703***	0.0641***	0.0470***	0.0512***	0.0498***	0.0707***	0.0398***	0.0333***	0.0242**	0.0296**	0.0271**	0.0426***
Age 46-55	0.0750***	0.0954***	0.0693***	0.0549***	0.0571***	0.0831***	0.0356***	0.0592***	0.0406***	0.0266**	0.0313***	0.0493***
Primary education (*ref: none*)	0.0431*	0.0476**	0.0261	-0.0030	-0.0175	0.0340*	0.0118	0.0096	0.0048	-0.0151	-0.0264**	0.0039
Secondary education	0.1183***	0.1028***	0.0734***	0.0441**	0.0398**	0.0886***	0.0500**	0.0260	0.0238	0.0018	0.0015	0.0232
Tertiary education	0.1676***	0.1512***	0.1203***	0.0917***	0.0716***	0.1366***	0.0844***	0.0628***	0.0642***	0.0390***	0.0191	0.0607***
Union member										0.0210**	0.0272***	0.0396***
Written contract							0.0162	0.0328***	0.0305***	0.0426***	0.0034	0.0297***
Permanent contract							0.0748***	0.0881***	0.0834***	0.0645***	0.0738***	0.0536***
Semi-skilled (*ref: elementary*)							0.0169	0.0126	0.0058	0.0166*	0.0008	0.0208**
Managerial/professional							0.0406***	0.0432***	0.0108	0.0293***	0.0119	0.0232**
Mining (*ref: agriculture*)							0.0529*	0.0809***	0.0437*	0.0367	0.0416	0.0563**
Manufacturing							0.0182	0.0294*	0.0294**	-0.0101	0.0166	0.0267
Utilities							-0.1786**	0.0173	0.0228	-0.0728	0.0698***	0.0105
Construction							-0.0365	-0.0237	-0.0360	0.0042	0.0145	-0.0135
Trade							0.0032	0.0300**	0.0163	0.0052	0.0257	0.0120
Transport							-0.0044	0.0340	0.0027	0.0035	0.0267	-0.0124
Financial services							0.0038	0.0393**	0.0066	0.0000	0.0228	0.0234
Community services							0.0025	-0.0019	-0.0081	-0.0080	0.0217	0.0067
Government/government-controlled (*ref: private enterprise*)							0.0511***	0.0295***	0.0389***	0.0203**	0.0227***	0.0266***
Non-profit							0.0298	0.0115	-0.0261	-0.0053	0.0105	0.0101
Between 10 and 50 employees (*ref: less than 10 employees*)							0.0436***	0.0500***	0.0460***	0.0541***	0.0553***	0.0524***
50 or more employees							0.0612***	0.0506***	0.0504***	0.0619***	0.0646***	0.0554***
N	9,272	9,896	9,868	9,413	10,133	10,705	9,102	9,715	9,644	9,073	9,698	10,221

Source: Own calculations using matched 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

Notes: This table shows average marginal effects based on binary probit regressions where the dependent variable takes value 1 for individuals that were in formal sector employment both in quarter t and quarter t+1, and value 0 for those no longer in formal sector employment in quarter t+1. The samples include only male/female matched panel members that were aged 20-55 and in formal sector employment in quarter t. The results for transitions from Q1 to Q2, Q2 to Q3, and Q3 to Q4 are pooled per year over 2008-2013. All regressions are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and attrition between quarters t and t+1. All models include as extra controls race dummies, a dummy for being married, household size, a rural geography dummy and province dummies (marginal effects not shown). Significance is based on survey design-adjusted standard errors. Significance levels: ***1% **5% *10%.

In columns (M2a)-(M2f) and (F2a)-(F2f) of Table 4 we augment our specifications with the same job-related variables as in Table 3 plus dummies for firm types (private, government/government-controlled, or non-profit) and firm size categories (proxied by the number of employees), both unavailable in the NIDS.[25] The results confirm the positive associations of permanent contracts and unionisation with job security. We now find that male semi-skilled and professional workers and female professionals were significantly more likely to stay employed in the formal sector than elementary workers, in line with the relatively high job exit rates for the latter reported by von Fintel and Burger (2009). Almost all sectors exhibited less job security for men than agriculture over 2008-2013. As in the NIDS, construction stood out as the industry with the lowest male job security. Conversely, the QLFS panels do not show a particularly large negative marginal effect for men employed in the trade sector or a positive effect of community services for female workers. Having a government rather than a private enterprise job shielded individuals from transitioning out of formal sector work, consistent with international evidence (Kopelman and Rosen, 2016). Men and women working in larger firms were in all years more likely to remain formally employed than small-company workers. This could reflect that small firms typically exhibit higher job destruction rates (Sandefur, 2010; Shiferaw and Bedi, 2013; Haltiwanger *et al.*, 2014; see Kerr *et al.*, 2014 on South Africa). Despite declines in the economic and statistical significance of marginal effects, age and higher education's protection against transitions out of formal sector jobs remains clearly visible in the augmented QLFS specifications, more so even than in the corresponding NIDS probits.[26] Education seems to capture certain skills that provide a buffer against job loss independent from unionisation, industry or other job characteristics (Leung *et al.*, 2014). Firms may be more willing to hold on to better-educated workers if education is correlated with worker productivity, as confirmed by South African industry-level data (Burger and Teal, 2015).

Comparing the marginal effects in Table 4 over time, we do notice some variation. Most notably, the strength of the education buffer decreased over the years; in the case of women, higher education's protection against job exit was significantly lower in 2010-2012

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[25] Information on union membership is only available in the QLFS data from 2010Q3 onwards.

[26] We have also experimented with running the probits of Table 4 separately by age group and by level of education. A number of findings from this exercise are worth noting. First, the buffering effects of secondary and tertiary education against job exit were present across all age groups but strongest for younger (20-35 year-old) male and female formal sector workers. Second, positive associations of age with continued employment were usually most significant for workers without a matric. Third, among the job-related variables, working under a permanent contract and in larger-sized firms were the most robust determinants of job security across the board, and again particularly important for workers with no or only primary education.

than in 2008. Age effects varied too, but it seems more difficult to pin down a clear trend. We could not detect similar trends in the medium-term NIDS panels.

The key finding that emerges from Tables 3 and 4 is that, next to voluntary choices about labour supply, demand-side factors mattered for continued regular wage/formal sector employment during and in the aftermath of the crisis, as evidenced by the significance of higher educational attainment, older age and a number of job-related variables. Extra support for the assertion that the downward labour market mobility we have studied so far is predominantly 'involuntary' comes from the self-reported reasons why individuals stopped working in their last job, captured in both the NIDS and QLFS. In the QLFS no less than 81% of men and 71% of women that transitioned from formal sector employment to non-employment between quarters reported 'lost job/job ended/laid off' as the main reason. These percentages were slightly lower in pre-crisis 2008 than in the other years (78% for men and 66% for women). Even though information is largely missing in the NIDS, 'lost job/job ended/laid off' tops the list of responses. In terms of labour market segmentation our results imply that it is selective rather than indiscriminate: higher-educated and/or more experienced workers benefit more than others from the labour market rigidities that restrict exit from the most valued (regular wage/formal sector) jobs. In the next subsection we shift our focus from downward to upward mobility.

4.2. Drivers of entry into regular wage / formal sector employment

Table 5 presents the estimation results of NIDS probit models for transitions *into* regular wage employment. Columns (M1a)-(M1b) and (F1a)-(F1b) reveal that men and women aged 26-35 were more successful in finding wage jobs over the crisis and non-crisis periods than youth (20-25). Education, especially at the secondary and tertiary level, had a strong positive association with finding wage employment, conform Cichello *et al.*'s (2014) results on the Black African subsample and Posel *et al.* (2014) on employment in general. Being married increased the likelihood of entering a wage job for men and decreased it for women.[27]

To check whether the effects of age and education on wage job entry are driven by differences in initial labour market statuses we add dummies for initial-wave discouragement, searching unemployment or employment in a 'non-wage' job (i.e., self-, casual or other employment) (columns (M2a)-(M2b) and (F2a)-(F2b)).

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[27] Racial differences are again difficult to evaluate in the NIDS. Other specifications indicate the influences of age and education are robust to the inclusion of controls for the presence of other wage workers, young children or OAP beneficiaries in the household and for interview timing.

Table 5: Probit estimates for entry into regular wage employment (NIDS), 2008-2010 and 2010-2012: average marginal effects

	(M1a)	(M2a)	(M3a)	(M1b)	(M2b)	(M3b)	(F1a)	(F2a)	(F3a)	(F1b)	(F2b)	(F3b)
	Male	Male	Male	Male	Male	Male	Female	Female	Female	Female	Female	Female
	2008-2010	2008-2010	2008-2010	2010-2012	2010-2012	2010-2012	2008-2010	2008-2010	2008-2010	2010-2012	2010-2012	2010-2012
Age 26-35 (*ref: age 20-25*)	0.0425	0.0380	0.0228	0.0746**	0.0617	0.0432	0.0511**	0.0386*	0.0363	0.0540**	0.0499**	0.0299
Age 36-45	0.0170	-0.0135	-0.0370	-0.0009	-0.0064	-0.0306	0.0007	-0.0096	-0.0154	0.0733**	0.0644**	0.0352
Age 46-55	-0.0711*	-0.0642	-0.0934**	-0.0315	-0.0338	-0.0578	-0.0126	-0.0174	-0.0264	-0.0074	-0.0136	-0.0435*
Primary education (*ref: none*)	0.0108	0.0087	0.0015	0.0806**	0.0726*	0.0848**	0.0400**	0.0374**	0.0389**	0.0468**	0.0398**	0.0424**
Secondary education	0.0996*	0.0861	0.0789	0.1113***	0.1054**	0.1181***	0.0887***	0.0838***	0.0883***	0.1078***	0.0982***	0.0874***
Tertiary education	0.2404***	0.3143***	0.3084***	0.1323*	0.1060	0.1251*	0.2179***	0.1981***	0.2009***	0.2042***	0.1829***	0.1783***
Discouraged (*ref: NEA*)		0.0516			0.0667			0.0068			-0.0021	
Searching unemployed		0.0325			0.0833**			0.0331*			0.0347	
Employed in non-wage job		0.0394			0.0950**			0.0381			0.0429	
Work experience			0.0557			0.0971***			0.0359*			0.0922***
N	1,692	1,566	1,490	1,849	1,763	1,705	3,665	3,528	3,466	3,420	3,318	3,291

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows average marginal effects based on binary probit regressions where the dependent variable takes value 1 for individuals that were not in regular wage employment in the initial wave but wage employed in the next wave, and value 0 for those not in regular wage employment in either of the waves. The samples include only male/female panel members that were aged 20-55 and not in regular wage employment in the initial wave. All regressions are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and between-wave attrition. All models include as extra controls race dummies, a dummy for being married, household size, a rural geography dummy and province dummies (marginal effects not shown). Significance is based on survey design-adjusted standard errors. Significance levels: ***1% **5% *10%.

The most significant result is that men who were actively searching for a job or in non-wage jobs in 2010 were more likely than the NEA to have a wage job by 2012. In columns (M3a)-(M3b) and (F3a)-(F3b) we replace the labour market status variables with a work experience dummy, defined here as having a non-wage job in the initial wave or having worked some time prior to that, and find it is positively associated with wage job entry. The marginal effects of age and education are somewhat affected by the inclusion of the extra labour market status or work experience variables but still point in the same direction as in the baseline specifications. The more educated and experienced found it easier to switch from being labour market outsiders to being insiders.

We again compare the NIDS-based results with evidence from the matched QLFS. Columns (M1a)-(M1f) and (F1a)-(F1f) of Table 6 show that finding a formal sector job was more likely for men and women aged 26-45 than for younger and older individuals. These age effects do not fully correspond with those estimated from the NIDS. But again in line with the NIDS, job finding probabilities increased progressively with educational attainment in the QLFS. It thus appears that the positive association between education and employment present in the QLFS panels of Verick (2012) and Leung *et al.* (2014) is due to both lower job exit (cf. Table 4) and higher job entry of the better-educated. Marriage increased (decreased) the probability of entry into formal jobs for men (women), just as in the NIDS. We do not discern any clear racial differences.[28]

Adding labour market status or work experience dummies alters the marginal effects of age considerably in the QLFS, more so than in the NIDS panels. In columns (M3a)-(M3f) and (F3a)-(F3f) the effect of the 46-55 age group dummy becomes significantly negative, reflecting that older individuals typically had previous work experience but were otherwise less likely to find formal sector jobs. As in the NIDS, work experience increased individuals' chances of moving into formal sector employment.[29] Informal sector workers, the searching unemployed and the discouraged (in that order) were more likely than the NEA to transition to formal sector employment and the largest effects are observed for men (columns (M2a)-(M2f) and (F2a)-(F2f)). These findings partly correspond with the medium-term results from the NIDS. The economic and statistical significance of the marginal effects of educational

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[28] As before, introducing extra household-level variables hardly changes the estimated influences of age and education.

[29] In unreported estimations we find that work experience that dated from three or more years ago had no significant effect on formal sector job entry compared to having no work experience at all, both for men and women. This is in line with arguments of 'human capital depreciation' (von Fintel and Burger, 2009). People that have been out of work for a longer time may see their knowledge and skills lose relevance because of technological progress. Hence, longer spells of non-employment (or a total lack of work experience) could be perceived by employers as signalling low productivity.

attainment are only minimally impacted by the extra labour market status or work experience controls.[30] Together with the evidence from the NIDS this suggests the link between higher education and job finding runs through other channels, such as firms' selection of workers based on skills (signalled by education), rather than simply education's influence on self-selection into particular labour market statuses.

Table 6 too exhibits time variation in the estimated marginal effects. Similar to our remaining in employment specifications (Table 4), the positive effects of higher education on finding formal sector employment were slightly larger before the crisis than during or in its early aftermath, again most significantly so for women.[31] Marginal job finding probabilities declined markedly post-2008 for searching and discouraged unemployed men and women.

All in all, Tables 5 and 6 again point to demand-side factors as key drivers of upward labour market mobility into regular wage and formal sector job. The significance of higher education and work experience effects on job entry probabilities is arguably more related to firms' demand for skilled and experienced labour than to labour supply (given our controls). The importance of labour demand for job entry is supported by other information in the NIDS and QLFS. 65% of men and 58% of women who switched from being searching unemployed to either non-searching unemployed or NEA between quarters in the QLFS indicated 'no jobs available in the area' as their primary motive for stopping job search. In the NIDS the non-searching unemployed that reported on why they had stopped looking for work mostly referred to 'discouragement' and the unaffordability of job search costs. Among the unsuccessful searching unemployed almost no one indicated having turned down job offers. More than half of all individuals successfully entering a wage job between NIDS waves found this job through referral from friends or relatives outside the household, a rather passive and demand-driven form of job matching (see Posel *et al.*, 2014). Once more, the evidence hints at selective labour market segmentation: barriers to entry into good jobs are more easily crossed by higher-educated, more experienced individuals.

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[30] Again we have run the probit regressions of Table 6 by age or education group. These regressions first of all indicate that higher education had a significantly positive effect on formal sector job entry for most male and female age groups, with the exception of the youngest and oldest males in some years. Second, the influence of age on job finding seems to vary considerably across education levels, without any clear trend, once we control for the initial labour market status or work experience. Third, the latter two variables mattered for all age and education groups. The positive association of initial informal sector employment with subsequent formal sector employment was particularly strong for the youngest individuals and those with (post-)matric education.

[31] One potential explanation for the smaller, insignificant marginal effect of tertiary education on male job entry in 2009 would be that higher-educated individuals decided to remain in/return to school. Closer inspection learns that the percentage of not formally employed men with tertiary education in one quarter that are students in the next quarter is indeed higher in 2009 than in 2008. This percentage is, however, equally high in 2010 (where we do observe a significantly positive marginal effect for tertiary education).

Table 6: Probit estimates for entry into formal sector employment (QLFS), 2008Q1-2013Q4: average marginal effects

	(M1a)	(M1b)	(M1c)	(M1d)	(M1e)	(M1f)	(M2a)	(M2b)	(M2c)	(M2d)	(M2e)	(M2f)	(M3a)	(M3b)	(M3c)	(M3d)	(M3e)	(M3f)
	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Age 26-35 (*ref: age 20-25*)	0.0618***	0.0385***	0.0388***	0.0308***	0.0287***	0.0321***	0.0343***	0.0177**	0.0198***	0.0121*	0.0094	0.0121*	0.0299***	0.0045	0.0153**	0.0057	-0.0025	0.0041
Age 36-45	0.0265***	0.0272***	0.0215***	0.0155**	0.0160**	0.0261***	0.0045	0.0062	0.0036	-0.0018	-0.0025	0.0060	-0.0115	-0.0153*	-0.0091	-0.0168**	-0.024***	-0.0109
Age 46-55	-0.0080	0.0003	0.0109	-0.0014	-0.0050	-0.0010	-0.0164*	-0.0099	0.0027	-0.0074	-0.0124	-0.0106	-0.042***	-0.038***	-0.0197**	-0.032***	-0.042***	-0.034***
Primary education (*ref: none*)	0.0156*	0.0087	0.0234***	0.0187***	0.0156**	0.0133*	0.0092	0.0036	0.0216***	0.0166***	0.0136**	0.0096	0.0141*	0.0069	0.0211***	0.0172***	0.0126**	0.0108
Secondary education	0.0390***	0.0243***	0.0308***	0.0288***	0.0295***	0.0284***	0.0306***	0.0199**	0.0312***	0.0279***	0.0285***	0.0280***	0.0425***	0.0275***	0.0331***	0.0314***	0.0316***	0.0315***
Tertiary education	0.0943***	0.0255	0.0650***	0.0646***	0.0459***	0.0445***	0.0822***	0.0204	0.0604***	0.0591***	0.0513***	0.0455***	0.0959***	0.0276	0.0664***	0.0621***	0.0471***	0.0464***
Discouraged (*ref: NEA*)							0.0441***	0.0433***	0.0227***	0.0337***	0.0227***	0.0287***						
Searching unemployed							0.0822***	0.0559***	0.0396***	0.0460***	0.0451***	0.0514***						
Employed in informal job							0.1228***	0.1139***	0.1070***	0.1039***	0.1034***	0.1083***						
Work experience													0.0823***	0.0792***	0.0615***	0.0640***	0.0712***	0.0657***
N	12,248	13,203	15,768	14,420	15,757	15,876	12,248	13,203	15,768	14,420	15,757	15,876	12,248	13,203	15,768	14,420	15,757	15,876

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Table 6 (Continued)

	(F1a)	(F1b)	(F1c)	(F1d)	(F1e)	(F1f)	(F2a)	(F2b)	(F2c)	(F2d)	(F2e)	(F2f)	(F3a)	(F3b)	(F3c)	(F3d)	(F3e)	(F3f)
	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Age 26-35 (*ref: age 20-25*)	0.0056	0.0114***	0.0102***	0.0155***	0.0181***	0.0074*	-0.0039	0.0036	0.0042	0.0104***	0.0118***	-0.0007	-0.0121**	-0.0037	-0.0025	0.0045	0.0070*	-0.0076
Age 36-45	0.0046	0.0171***	0.0142***	0.0094**	0.0158***	0.0060	-0.0070	0.0030	0.0040	0.0010	0.0053	-0.0070	-0.019***	-0.0058	-0.0051	-0.0073	-0.0017	-0.0149**
Age 46-55	-0.0067	-0.0005	0.0051	0.0068	0.0121***	-0.0055	-0.0142**	-0.0104**	-0.0033	-0.0009	0.0044	-0.015***	-0.031***	-0.021***	-0.014***	-0.0106**	-0.0066	-0.027***
Primary education (*ref: none*)	0.0131***	0.0116***	0.0135***	0.0086***	0.0122***	0.0136***	0.0113***	0.0092***	0.0123***	0.0079**	0.0107***	0.0117***	0.0123***	0.0107***	0.0126***	0.0083***	0.0111***	0.0117***
Secondary education	0.0485***	0.0343***	0.0322***	0.0327***	0.0323***	0.0275***	0.0418***	0.0301***	0.0295***	0.0314***	0.0293***	0.0256***	0.0493***	0.0347***	0.0330***	0.0346***	0.0327***	0.0265***
Tertiary education	0.1080***	0.0681***	0.0485***	0.0581***	0.0788***	0.0666***	0.0920***	0.0578***	0.0494***	0.0540***	0.0718***	0.0657***	0.0982***	0.0667***	0.0465***	0.0551***	0.0743***	0.0619***
Discouraged (*ref: NEA*)							0.0409***	0.0143***	0.0133***	0.0132***	0.0165***	0.0265***						
Searching unemployed							0.0428***	0.0318***	0.0166***	0.0150***	0.0312***	0.0284***						
Employed in informal job							0.0673***	0.0655***	0.0536***	0.0500***	0.0556***	0.0655***						
Work experience													0.0466***	0.0439***	0.0353***	0.0348***	0.0364***	0.0376***
N	22,774	23,900	25,903	23,872	24,742	24,538	22,774	23,900	25,903	23,872	24,742	24,538	22,774	23,900	25,903	23,872	24,742	24,538

Source: Calculated from matched 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

Notes: This table shows average marginal effects based on binary probit regressions where the dependent variable takes value 1 for individuals that were not in formal sector employment in quarter t but formal sector employed in quarter t+1, and value 0 for those not in formal sector employment in either of the quarters. The samples include only male/female matched panel members that were aged 20-55 and not in formal sector employment in quarter t. The results for transitions from Q1 to Q2, Q2 to Q3, and Q3 to Q4 are pooled per year over 2008-2013. All regressions are weighted using panel weights that calibrate the samples to population totals and account for initial non-response and attrition between quarters t and t+1. All models include as extra controls race dummies, a dummy for being married, household size, a rural geography dummy and province dummies (marginal effects not shown). Significance is based on survey design-adjusted standard errors. Significance levels: ***1% **5% *10%.

5. Concluding remarks

This paper has studied individual labour market mobility and its determinants in South Africa since the start of the global financial and economic crisis, making use and comparing two large longitudinal datasets: first, a set of two-year panels over 2008-2010 and 2010-2012 based on the NIDS; and second, quarter-to-quarter matched QLFS cross-sections over 2008Q1-2013Q4. These datasets have allowed us to move beyond the usual cross-sectional descriptions of South African labour market 'insiders' and 'outsiders' (Kingdon and Knight, 2009). We have looked into both the extent and the nature of labour market segmentation, building on but broadening the scope and time frame of previous studies using the NIDS or matched QLFS.

Several results stand out. First, underlying (sometimes relatively small) net changes in South African labour market statistics we find considerable mobility, both in the short and medium run. Many men and women transitioned in and out of employment and between different employment and non-employment statuses over the study period. Mobility within non-employment, i.e., changes in job search decisions, accounted for a large part of overall mobility. Second, we show that short-term labour market mobility was higher before the crisis (2008) than in the post-crisis years (2009-2012 in particular). We thus confirm earlier claims that the rise in unemployment rates since the crisis should be ascribed more to reduced inflows into employment than to increased outflows (von Fintel and Burger, 2009; Verick, 2012; Leung *et al.*, 2014). Third, our econometric models of short- and medium-term transitions in and out of regular wage and formal sector jobs stress the importance of demand-side factors outside of individuals' direct control. Matric or post-matric level education and, to some extent, older age increased workers' job security, above and beyond the influence of other job-related variables. Higher education also helped individuals find jobs, independent of their initial labour market status and earlier work experience. Fourth, the economic significance of key mobility determinants varied over time. Most notably, the matched QLFS indicates that both the buffering effect against job loss and the beneficial effect on job entry of higher education gradually declined in strength over the first post-crisis years.

The implications of our findings are the following. First of all, the degree of mobility between labour market statuses we (and others) have documented call for a qualification of the hardwired image of the South African labour market being strictly segmented and rigid in every respect. Indeed, our evidence implies that South African labour market segmentation manifests itself through selective rather than indiscriminate rigidities. Barriers to entry into

the most valued jobs are much more permeable for higher-educated and/or more experienced labour market participants. Once they land such jobs, these same individuals benefit more from downward rigidity in the labour market than others. One obvious explanation is that higher education levels proxy and/or signal particular skills that are valued by South African employers (partly because of higher productivity; Burger and Teal, 2015).[32] The firing and new hiring of skilled (educated) workers is also relatively expensive, providing them with extra protection from job separation (Leung *et al.*, 2014). Second, the extent and nature of South African labour market segmentation is not fixed and seems to be influenced by external events. The decrease in short-term mobility and associated increase in unemployment rates following the crisis may well have been the result of an intensifying uphill battle of labour market outsiders against insiders with greater bargaining power (von Fintel and Burger, 2009). To bring down South African unemployment, interventions aimed at job creation and increasing the employability of the outsiders deserve particular attention. Finally, it also appears that segmentation became gradually less selective on the level of education in the aftermath of the crisis. A possible reason could be that, again due to higher matching costs, better-educated workers are only made redundant when the economic malaise drags on (after employees with lower education have already been shed). A protracted crisis may also lead some firms to (progressively) cut back on new hiring of expensive workers.[33]

Because of South Africa's idiosyncrasies, one should be careful in extrapolating all this to other African labour markets. That notwithstanding, our analysis demonstrates the value added of nationally representative, individual-level labour market panel datasets. As such data becomes increasingly available for other African countries too, it would be interesting to harmonise variable definitions and perform comparative studies of labour market mobility and segmentation.[34] One direction in which our analysis could be extended is a more in-depth analysis of transitions between informal and formal sector employment, or between jobs within each of these sectors, to explore other forms of labour market segmentation that may be present (Fields, 2007). Within-informal sector dynamics would be a topic of particular relevance for researchers studying other African labour markets, where informality is more widespread than in South Africa.

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[32] This should not detract from the fact that the quality of secondary schooling continues to be very poor and unevenly distributed in South Africa (van der Berg, 2009; Spaull, 2013).

[33] Such admittedly speculative hypotheses will need to be further tested in the South African context, preferably using firm-level data.

[34] The World Bank already engages in harmonising labour force and other household surveys through its Africa Region Survey-Based Harmonized Indicator Program (SHIP). Most of the limited number of African SHIP panels that exist have relatively long time spans between waves (typically five years or more), which complicates the study of labour market dynamics.

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Appendix

Table A1: Evolution of unemployment rates (QLFS), 2008-2013

	Narrow unemployment rate (%)						Broad unemployment rate (%)					
	2008	2009	2010	2011	2012	2013	2008	2009	2010	2011	2012	2013
Overall	22.5	23.7	24.9	24.8	24.9	24.7	27.0	29.5	32.3	32.9	33.0	32.7
Male	19.8	22.0	23.0	22.7	23.0	23.1	23.2	26.7	29.2	29.6	29.8	30.0
Female	25.9	25.7	27.2	27.3	27.2	26.7	31.4	32.8	36.0	36.7	36.7	35.8
Black/African	26.5	27.7	29.0	28.6	28.3	27.9	31.7	34.6	37.7	38.0	37.8	37.1
Coloured	18.8	20.2	22.2	22.9	24.1	24.1	20.7	22.2	25.1	26.2	26.9	27.0
Asian/Indian	11.6	11.6	8.7	10.5	10.6	12.3	12.4	13.8	10.9	12.6	12.9	15.5
White	4.2	4.7	5.9	5.8	5.8	6.8	4.7	5.4	7.1	7.0	6.9	7.8
Age 15-25	43.4	45.8	48.8	48.1	49.2	48.9	49.0	53.4	58.1	58.7	59.5	59.2
Age 26-35	24.1	26.6	27.7	28.0	27.8	27.4	28.4	32.1	34.8	35.6	35.5	35.1
Age 36-45	15.4	15.9	16.9	17.5	17.6	18.0	18.7	20.5	22.7	23.9	23.9	23.9
Age 46-55	9.7	10.7	11.8	12.1	12.5	12.3	13.1	14.8	17.4	17.7	18.3	18.3
Age 56-64	6.8	5.7	7.2	5.8	6.6	7.2	9.6	8.7	11.5	9.9	11.4	11.8
No education	19.8	20.8	22.4	20.8	21.4	19.9	27.4	30.6	34.7	34.3	34.9	33.1
Primary education	28.1	29.3	30.5	30.8	31.0	31.1	33.3	36.3	39.4	40.4	40.6	40.7
Secondary education	23.7	25.4	26.7	27.0	26.3	26.3	26.7	29.5	32.1	33.1	32.4	32.3
Tertiary education	7.6	8.3	9.1	8.7	9.4	9.9	8.3	9.3	11.0	11.0	11.5	11.9
Urban	21.1	22.7	24.1	24.2	24.2	24.5	23.8	26.1	28.5	28.6	28.5	28.8
Rural	27.3	26.9	27.5	27.0	27.3	25.6	36.3	39.3	43.4	45.2	45.2	43.3

Source: Own calculations using 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).
Notes: This table shows the evolution of overall and group-specific unemployment rates over 2008-2013. The samples include only individuals of working age (15-64). All figures are averaged over four quarters and weighted using cross-sectional weights that calibrate the samples to population totals and account for non-response. The narrow unemployment rate is calculated as (unemployed searching)/(unemployed searching + employed), and the broad unemployment rate as (unemployed searching and discouraged)/(unemployed searching and discouraged + employed).

Table A2: Labour market mobility measures and decompositions (NIDS), 2008-2010 and 2010-2012 (%)

	Mobility				
	Overall	Upward (into employment)	Downward (out of employment)	Within employment	Within non-employment
All adults					
2008-2010	50.6	12.5	14.8	6.5	16.8
2010-2012	49.1	14.8	11.1	5.3	17.8
Male					
2008-2010	46.7	11.8	14.6	9.3	11.0
2010-2012	48.5	15.6	11.3	7.6	13.9
Female					
2008-2010	53.5	13.0	14.9	4.4	21.1
2010-2012	49.6	14.2	11.0	3.5	20.9

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows measures of labour market mobility based on transition matrices for all NIDS panel members aged 20-55 in the initial wave of each of the panels (Table 1) and for male and female individuals separately. Total mobility is defined as the percentage of (male and/or female) individuals that change labour market status between 2008 and 2010, or between 2010 and 2012. It is decomposed into upward mobility (the percentage of individuals that change status from searching unemployed, discouraged unemployed or NEA to regular wage, self-, or casual and other employment), downward mobility (the percentage of individuals that change status from regular wage, self-, or casual and other employment to searching unemployed, discouraged unemployed or NEA), within employment mobility (the percentage of individuals that switch among regular wage, self-, and casual and other employment statuses) and within non-employment mobility (the percentage of individuals that switch among searching unemployed, discouraged unemployed and NEA statuses). For the calculation of overall mobility and the decomposition method, see main text (Section 2.3).

Table A3: Labour market mobility measures and decompositions (QLFS), 2008Q1-2013Q4 (%)

| | Mobility | | | | |
	Overall	Upward (into employment)	Downward (out of employment)	Within employment	Within non-employment
All adults					
2008	21.0	4.8	4.0	3.3	8.9
2009	19.3	3.6	3.5	2.6	9.5
2010	18.9	3.4	3.0	2.4	10.0
2011	18.7	3.2	2.9	2.4	10.2
2012	18.4	3.4	3.0	2.4	9.6
2013	19.2	3.9	3.4	2.4	9.4
Male					
2008	19.4	4.9	4.0	4.3	6.3
2009	18.4	3.8	3.6	3.3	7.6
2010	18.2	3.8	3.1	3.2	8.1
2011	17.8	3.4	3.3	3.0	8.1
2012	17.8	3.6	3.2	3.1	7.9
2013	18.5	4.1	3.7	3.0	7.6
Female					
2008	22.4	4.7	4.1	2.3	11.3
2009	20.1	3.4	3.4	2.0	11.2
2010	19.6	3.1	2.9	1.7	11.9
2011	19.6	3.0	2.6	1.8	12.1
2012	19.0	3.2	2.9	1.8	11.1
2013	19.8	3.7	3.1	1.9	11.1

Source: Own calculations using matched 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).
Notes: This table shows measures of labour market mobility based on yearly pooled transition matrices for all quarter-to-quarter matched QLFS individuals aged 20-55 in quarter t (Table 2) and for male and female individuals separately. Total mobility is defined as the percentage of (male and/or female) individuals that change labour market status between quarters t and t+1, pooled per year over 2008-2013. It is decomposed into upward mobility (the percentage of individuals that change status from searching unemployed, discouraged unemployed or NEA to formal sector or informal sector employment), downward mobility (the percentage of individuals that change status from formal sector or informal sector employment to searching unemployed, discouraged unemployed or NEA), within employment mobility (the percentage of individuals that switch among formal sector and informal sector employment statuses) and within non-employment mobility (the percentage of individuals that switch among searching unemployed, discouraged unemployed and NEA statuses). For the calculation of overall mobility and the decomposition method, see main text (Section 2.3).
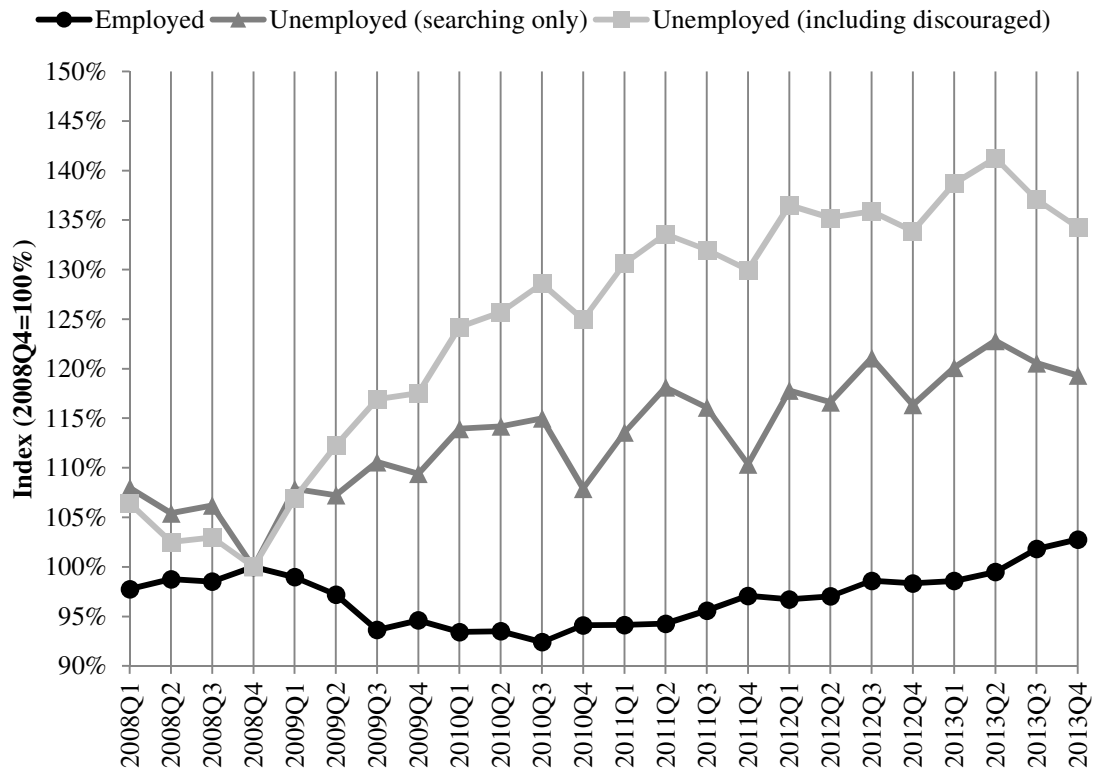
Figure A1: Evolution of total employment and unemployment, 2008Q1-2013Q4

Source: Own calculations using 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

South African labour market transitions since the global financial and economic crisis:
Evidence from two longitudinal datasets

Supplementary Material: Online Appendix

Table S1: Sample compositions of cross-sections and panels (NIDS), 2008-2010 and 2010-2012

	2008 cross-section w/ calibrated weights	2008-2010 panel w/ panel weights	2010 cross-section w/ calibrated weights	2010-2012 panel w/ panel weights
N	10,130	7,303	9,187	7,574
% Male	44.5	42.4	44.7	43.9
% Female	55.5	57.6	55.3	56.1
% Black/African	80.2	82.5	84.1	84.7
% Coloured	8.4	7.4	7.8	7.7
% Asian/Indian	2.4	2.4	2.6	2.5
% White	9.0	7.7	5.5	5.1
% Age 20-25	22.1	21.5	23.4	22.4
% Age 26-35	33.8	32.6	31.9	31.2
% Age 36-45	25.7	26.0	25.0	25.6
% Age 46-55	18.3	19.8	19.8	20.8
% Urban	62.6	61.3	60.7	60.7
% Rural	37.4	38.7	39.3	39.3
% No education	18.9	18.9	15.4	16.5
% Primary education	45.7	46.1	47.3	47.7
% Secondary education	22.0	22.3	23.1	21.8
% Tertiary education	13.4	12.7	14.2	13.9
% Regular wage employment	38.7	37.2	37.7	37.0
% Self-employment	7.4	7.4	5.6	5.6
% Casual/other employment	7.9	8.3	4.6	5.1
% Unemployed, searching	17.6	18.1	12.6	12.9
% Unemployed, discouraged	6.0	6.1	4.8	4.9
% NEA	22.4	23.0	34.7	34.5

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows the raw sample sizes and weighted sample compositions (in terms of baseline gender, race, age, geography, educational attainment and labour market status) of the 2008/2010 NIDS cross-sections and 2008-2010/2010-2012 panels of individuals that were aged 20-55 in the initial wave. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for between-wave attrition.

Table S2: Matching algorithm for QLFS rotating panel, 2008Q1-2013Q4

	Description	Number of Observations
Step 1:	Append all QLFS cross-sections (quarters) and keep working-age population (aged 15 to 64).	1,303,404
Step 2:	Sort on household identifier and quarter and drop households that appear only once.	1,256,528
Step 3:	For each quarter and within the same household, drop individuals that have the same race, gender and ages differing by at most one year. These '(almost) twins' cannot be uniquely matched between quarters.	1,201,548
Step 4:	Match the remaining individuals from quarter t to quarter t+1 using the household identifier, race, gender and $age_t=age_{t+1}$ or $age_t +1= age_{t+1}$.	1,037,436
Step 5:	Impose additional consistency requirements:	
	a) Drop individuals with missing value for categorical educational attainment variable (No/primary/secondary/tertiary education).	1,028,577
	b) Drop individuals whose educational attainment diminishes between quarters.	997,395
	c) Drop individuals whose educational attainment jumps more than one category between quarters.	994,066
	d) Drop individuals whose educational attainment changes from 'none (or incomplete primary)' to 'primary (or incomplete secondary)'.	977,492
	e) Drop individuals older than 21 whose educational attainment changes from 'primary (or incomplete secondary)' to 'secondary completed'.	964,604
	f) Drop individuals older than 24 whose educational attainment changes from 'secondary completed' to 'tertiary'.	959,070
	g) Drop individuals whose marital status changes from 'married', 'widowed' or 'divorced' to 'never married'.	**952,158**

Source: Own adaptation and application to 2008Q1-2013Q4 QLFS data of the algorithm developed by Ranchhod and Dinkelman (2008).

Table S3: Sample compositions of cross-sections and matched panels (QLFS), 2008Q1-2013Q4

	2008 cross-sections w/ calibrated weights	2008 panels w/ panel weights	2009 cross-sections w/ calibrated weights	2009 panels w/ panel weights	2010 cross-sections w/ calibrated weights	2010 panels w/ panel weights	2011 cross-sections w/ calibrated weights	2011 panels w/ panel weights	2012 cross-sections w/ calibrated weights	2012 panels w/ panel weights	2013 cross-sections w/ calibrated weights	2013 panels w/ panel weights
N	128,599	56,674	123,306	59,593	118,134	64,100	112,442	59,376	116,488	63,345	118,357	64,067
% Male	48.6	48.0	48.8	48.0	48.9	48.5	49.0	48.4	49.2	48.7	49.3	48.8
% Female	51.4	52.0	51.2	52.0	51.1	51.5	51.0	51.6	50.8	51.3	50.7	51.2
% Black/African	77.8	77.3	78.1	77.9	78.4	78.1	78.7	78.5	79.0	78.6	79.4	78.9
% Coloured	9.6	9.8	9.6	9.6	9.5	9.7	9.5	9.4	9.4	9.7	9.4	9.7
% Asian/Indian	2.8	2.9	2.8	3.0	2.8	2.9	2.8	2.8	2.8	2.7	2.8	2.9
% White	9.8	10.0	9.6	9.4	9.2	9.4	9.0	9.2	8.8	8.9	8.5	8.6
% Age 20-25	23.7	23.3	23.2	23.0	23.0	23.0	22.9	22.8	22.6	22.4	22.6	22.5
% Age 26-35	34.1	34.2	33.9	33.9	34.0	33.8	33.9	33.5	33.5	33.5	33.5	33.3
% Age 36-45	24.7	24.9	25.3	25.6	25.2	25.3	25.3	25.4	25.9	26.0	26.0	26.0
% Age 46-55	17.6	17.6	17.6	17.5	17.8	17.9	17.9	18.2	18.0	18.2	17.9	18.1
% Urban	69.8	69.6	69.5	69.3	69.1	69.3	69.5	69.0	69.6	69.0	70.0	69.7
% Rural	30.2	30.4	30.5	30.7	30.9	30.7	30.5	31.0	30.4	31.0	30.0	30.3
% No education	16.4	16.5	15.1	15.0	13.6	13.7	12.5	12.5	11.9	11.9	11.1	11.0
% Primary edu.	44.9	44.4	44.6	44.2	45.3	45.0	45.6	45.4	45.3	45.1	45.1	44.8
% Secondary edu.	27.2	27.6	28.1	28.4	29.1	29.3	29.4	29.5	30.2	30.6	30.5	30.9
% Tertiary edu.	11.4	11.5	12.2	12.4	11.9	12.0	12.5	12.6	12.6	12.4	13.3	13.3
% Formal employ.	40.8	41.1	39.8	40.4	37.4	37.6	37.4	37.5	38.2	38.5	38.5	38.9
% Informal employ.	14.2	14.0	13.3	12.8	13.0	12.6	12.8	12.5	12.5	12.2	12.4	12.2
% Unemploy., search.	16.4	16.0	16.6	16.3	17.2	17.0	17.2	17.0	17.3	17.3	17.3	17.2
% Unemploy., disc.	4.2	4.3	5.4	5.2	7.1	7.1	7.9	8.0	8.1	8.3	8.2	8.1
% NEA	24.4	24.6	24.9	25.3	25.3	25.6	24.7	25.0	23.9	23.8	23.5	23.6

Source: Own calculations using 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

Notes: This table shows the raw sample sizes and weighted sample compositions (in terms of baseline gender, race, age, geography, educational attainment and labour market status) of the QLFS cross-sections and quarter-to-quarter matched panels of individuals that were aged 20-55 in quarter t, pooled per year over 2008-2013. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for attrition between quarters t and t+1.

Table S4: Subsample compositions of male and female regular wage workers (NIDS), 2008-2010 and 2010-2012

	Male 2008 cross-section w/ calibrated weights	Male 2008-2010 panel w/ panel weights	Male 2010 cross-section w/ calibrated weights	Male 2010-2012 panel w/ panel weights	Female 2008 cross-section w/ calibrated weights	Female 2008-2010 panel w/ panel weights	Female 2010 cross-section w/ calibrated weights	Female 2010-2012 panel w/ panel weights
N	1,817	1,150	1,533	1,159	1,646	1,221	1,554	1,301
% Black/African	75.2	78.1	79.0	80.5	70.6	71.3	78.0	75.8
% Coloured	9.3	9.1	8.7	9.5	12.6	12.7	11.7	11.5
% Asian/Indian	3.2	2.7	3.8	3.2	2.5	2.2	2.4	3.1
% White	12.3	10.1	8.5	6.8	14.3	13.8	8.0	9.6
% Age 20-25	12.8	12.5	11.7	10.5	12.1	12.2	11.7	11.5
% Age 26-35	39.1	37.7	35.1	33.7	35.3	33.2	34.3	33.2
% Age 36-45	32.2	32.5	32.3	32.6	32.9	32.3	33.2	34.7
% Age 46-55	15.9	17.3	20.9	23.3	19.7	22.4	20.8	20.6
% Urban	72.6	71.8	72.5	72.5	73.9	74.8	73.0	73.4
% Rural	27.4	28.2	27.5	27.5	26.1	25.2	27.0	26.6
% No education	15.7	13.4	12.7	15.7	10.8	11.3	9.1	9.1
% Primary education	38.3	38.6	39.7	39.7	36.9	38.2	37.5	36.1
% Secondary education	26.3	28.1	27.6	24.3	25.0	25.1	22.3	22.7
% Tertiary education	19.6	19.9	20.0	20.3	27.3	25.3	31.1	32.2

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows the raw subsample sizes and weighted subsample compositions (in terms of baseline race, age, geography and educational attainment) of the 2008/2010 NIDS cross-sections and 2008-2010/2010-2012 panels of male/female individuals that were aged 20-55 and in regular wage employment in the initial wave. As such, the panel subsamples correspond to the subsamples that feature in the regressions of Table 3 in the main text. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for between-wave attrition.

Table S5: Subsample compositions of male and female formal sector workers (QLFS), 2008Q1-2013Q4

	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male	Male
	2008 cross-sections w/ calibrated weights	2008 panels w/ panel weights	2009 cross-sections w/ calibrated weights	2009 panels w/ panel weights	2010 cross-sections w/ calibrated weights	2010 panels w/ panel weights	2011 cross-sections w/ calibrated weights	2011 panels w/ panel weights	2012 cross-sections w/ calibrated weights	2012 panels w/ panel weights	2013 cross-sections w/ calibrated weights	2013 panels w/ panel weights
N	28,022	12,380	25,930	12,594	23,204	12,561	21,888	11,671	23,422	12,713	23,988	12,948
% Black/African	68.1	67.3	68.1	67.6	67.4	66.8	68.3	66.9	69.1	68.3	69.9	69.0
% Coloured	11.3	12.1	11.4	11.9	11.6	12.0	11.3	11.7	11.1	11.5	11.1	11.4
% Asian/Indian	4.2	4.3	4.2	4.8	4.6	4.8	4.4	4.5	4.4	4.4	4.2	4.3
% White	16.4	16.3	16.3	15.8	16.4	16.4	16.1	16.9	15.4	15.8	14.9	15.3
% Age 20-25	14.5	14.0	13.4	13.1	12.7	12.8	11.5	11.2	11.6	11.8	11.5	12.0
% Age 26-35	37.1	37.5	36.6	36.7	36.7	36.8	37.1	37.0	35.8	36.0	35.9	36.0
% Age 36-45	29.3	29.2	30.2	30.6	30.5	30.5	31.3	31.0	32.1	31.7	32.7	32.1
% Age 46-55	19.2	19.3	19.7	19.6	20.1	19.9	20.1	20.9	20.5	20.5	20.0	19.9
% Urban	81.9	81.6	81.7	82.1	82.0	82.6	82.3	82.1	82.3	82.1	81.1	81.5
% Rural	18.1	18.4	18.3	17.9	18.0	17.4	17.7	17.9	17.7	17.9	18.9	18.5
% No education	11.5	11.3	10.0	9.5	8.0	7.8	7.7	7.3	7.6	7.4	7.1	6.9
% Primary edu.	37.4	36.9	36.9	36.3	36.4	35.6	36.1	35.3	36.0	35.4	35.3	34.4
% Secondary edu.	32.6	32.7	32.7	33.6	34.9	35.5	34.5	35.1	34.7	35.5	34.6	35.9
% Tertiary edu.	18.6	19.2	20.5	20.7	20.7	21.2	21.7	22.3	21.6	21.7	23.1	22.9

Table S5 (Continued)

	Female 2008 cross-sections w/ calibrated weights	Female 2008 panels w/ panel weights	Female 2009 cross-sections w/ calibrated weights	Female 2009 panels w/ panel weights	Female 2010 cross-sections w/ calibrated weights	Female 2010 panels w/ panel weights	Female 2011 cross-sections w/ calibrated weights	Female 2011 panels w/ panel weights	Female 2012 cross-sections w/ calibrated weights	Female 2012 panels w/ panel weights	Female 2013 cross-sections w/ calibrated weights	Female 2013 panels w/ panel weights
N	20,429	9,272	19,739	9,896	17,788	9,868	17,247	9,413	18,319	10,133	19,108	10,705
% Black/African	62.0	61.0	61.8	61.6	61.1	60.2	63.3	62.1	64.9	64.0	66.3	65.4
% Coloured	13.8	13.8	14.1	14.1	14.2	14.3	13.6	14.3	13.7	14.4	13.5	14.0
% Asian/Indian	4.0	4.0	3.7	3.8	4.6	4.7	4.1	4.3	4.0	4.0	3.9	4.2
% White	20.2	21.1	20.3	20.5	20.0	20.8	19.0	19.3	17.5	17.6	16.2	16.4
% Age 20-25	15.5	15.4	14.0	14.2	12.7	13.1	12.8	12.9	11.4	11.4	12.2	12.0
% Age 26-35	36.8	37.5	35.7	36.3	36.0	35.7	35.2	34.6	36.4	36.1	35.9	36.1
% Age 36-45	29.4	29.5	30.6	30.2	31.7	32.0	31.4	31.2	32.6	33.2	32.1	31.8
% Age 46-55	18.3	17.6	19.7	19.2	19.6	19.2	20.6	21.4	19.6	19.2	19.9	20.2
% Urban	82.4	82.7	82.9	83.7	82.5	82.8	82.7	82.1	82.3	82.6	82.2	82.2
% Rural	17.6	17.3	17.1	16.3	17.5	17.2	17.3	17.9	17.7	17.4	17.8	17.8
% No education	5.8	5.3	5.6	5.2	5.0	4.7	4.8	4.9	4.7	4.6	4.4	4.1
% Primary edu.	29.1	26.8	27.7	27.2	28.5	27.6	27.1	26.1	28.1	27.5	28.2	28.0
% Secondary edu.	36.4	38.0	36.0	36.4	36.3	36.9	36.4	36.4	36.6	37.3	36.2	36.1
% Tertiary edu.	28.7	29.8	30.7	31.3	30.1	30.8	31.7	32.6	30.6	30.6	31.2	31.8

Source: Own calculations using 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).
Notes: This table shows the raw subsample sizes and weighted subsample compositions (in terms of baseline race, age, geography and educational attainment) of the QLFS cross-sections and quarter-to-quarter matched panels of male/female individuals that were aged 20-55 and in formal sector employment in quarter t, pooled per year over 2008-2013. As such, the panel subsamples correspond to the subsamples that feature in the regressions of Table 4 in the main text. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for attrition between quarters t and t+1.

Table S6: Subsample compositions of men and women outside regular wage employment (NIDS), 2008-2010 and 2010-2012

	Male 2008 cross-section w/ calibrated weights	Male 2008-2010 panel w/ panel weights	Male 2010 cross-section w/ calibrated weights	Male 2010-2012 panel w/ panel weights	Female 2008 cross-section w/ calibrated weights	Female 2008-2010 panel w/ panel weights	Female 2010 cross-section w/ calibrated weights	Female 2010-2012 panel w/ panel weights
N	2,407	1,698	2,372	1,865	4,658	3,678	3,980	3,459
% Black/African	85.8	90.0	90.0	90.2	83.3	84.9	85.8	87.3
% Coloured	7.6	4.6	6.0	5.6	7.2	6.6	7.2	6.9
% Asian/Indian	1.2	1.3	1.6	1.3	2.4	2.7	2.5	2.5
% White	5.3	4.1	2.5	2.9	7.0	5.7	4.4	3.4
% Age 20-25	32.5	32.3	37.1	35.0	26.0	24.7	26.8	26.0
% Age 26-35	30.7	28.5	29.4	29.7	32.1	32.1	30.6	29.9
% Age 36-45	19.3	20.4	16.7	17.0	22.8	23.3	22.5	23.3
% Age 46-55	17.5	18.7	16.8	18.4	19.0	19.9	20.2	20.8
% Urban	58.1	55.1	54.1	55.4	55.9	54.6	53.3	52.6
% Rural	41.9	44.9	45.9	44.6	44.1	45.4	46.7	47.4
% No education	23.4	26.0	18.6	19.4	21.3	21.2	18.0	18.9
% Primary education	48.9	48.0	51.2	52.3	51.9	52.3	53.6	54.3
% Secondary education	20.7	19.9	22.5	21.8	19.2	19.3	21.1	20.1
% Tertiary education	7.0	6.1	7.7	6.5	7.6	7.3	7.3	6.7

Source: Own calculations using 2008-2010-2012 NIDS data (SALDRU, various years).

Notes: This table shows the raw subsample sizes and weighted subsample compositions (in terms of baseline race, age, geography and educational attainment) of the 2008/2010 NIDS cross-sections and 2008-2010/2010-2012 panels of male/female individuals that were aged 20-55 and not in regular wage employment in the initial wave. As such, the panel subsamples correspond to the subsamples that feature in the regressions of Table 5 in the main text. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for between-wave attrition.

Table S7: Subsample compositions of men and women outside formal sector employment (QLFS), 2008Q1-2013Q4

	Male 2008 cross-sections w/ calibrated weights	Male 2008 panels w/ panel weights	Male 2009 cross-sections w/ calibrated weights	Male 2009 panels w/ panel weights	Male 2010 cross-sections w/ calibrated weights	Male 2010 panels w/ panel weights	Male 2011 cross-sections w/ calibrated weights	Male 2011 panels w/ panel weights	Male 2012 cross-sections w/ calibrated weights	Male 2012 panels w/ panel weights	Male 2013 cross-sections w/ calibrated weights	Male 2013 panels w/ panel weights
N	29,971	12,248	29,295	13,203	30,005	15,768	28,880	14,420	29,895	15,757	30,551	15,876
% Black/African	87.5	87.4	87.4	87.9	87.7	87.1	87.3	87.9	87.4	87.5	87.5	87.3
% Coloured	7.5	7.4	7.4	7.0	7.4	7.9	7.7	7.1	7.6	7.7	7.5	7.8
% Asian/Indian	1.6	1.6	1.7	1.7	1.5	1.5	1.7	1.7	1.7	1.7	1.8	1.9
% White	3.4	3.6	3.5	3.4	3.4	3.6	3.4	3.3	3.3	3.1	3.3	3.1
% Age 20-25	34.2	34.8	33.7	34.5	33.2	33.7	33.4	33.9	33.1	33.2	32.9	33.5
% Age 26-35	32.7	32.4	32.8	32.3	32.9	31.9	32.8	32.5	32.8	32.7	33.0	32.4
% Age 36-45	18.5	18.4	19.8	20.1	19.6	19.8	19.6	19.8	20.1	19.9	20.1	20.1
% Age 46-55	14.6	14.3	13.7	13.1	14.2	14.6	14.2	13.7	14.0	14.2	14.0	14.0
% Urban	62.1	61.5	62.2	60.8	61.8	61.5	62.3	61.5	62.0	60.7	62.8	61.9
% Rural	37.9	38.5	37.8	39.2	38.2	38.5	37.7	38.5	38.0	39.3	37.2	38.1
% No education	21.9	22.1	19.8	20.2	17.7	17.8	16.2	16.0	15.6	15.8	14.6	14.5
% Primary edu.	51.8	51.4	52.3	52.3	52.7	52.8	53.7	54.1	53.1	53.5	53.8	54.3
% Secondary edu.	22.9	23.5	24.3	24.2	25.8	26.0	26.1	26.1	27.3	27.1	27.2	27.3
% Tertiary edu.	3.5	3.0	3.6	3.4	3.9	3.4	4.0	3.8	4.1	3.6	4.4	4.0

Table S7 (Continued)

	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female
	2008 cross-sections w/ calibrated weights	2008 panels w/ panel weights	2009 cross-sections w/ calibrated weights	2009 panels w/ panel weights	2010 cross-sections w/ calibrated weights	2010 panels w/ panel weights	2011 cross-sections w/ calibrated weights	2011 panels w/ panel weights	2012 cross-sections w/ calibrated weights	2012 panels w/ panel weights	2013 cross-sections w/ calibrated weights	2013 panels w/ panel weights
N	50,177	22,774	48,342	23,900	47,137	25,903	44,427	23,872	44,852	24,742	44,710	24,538
% Black/African	85.2	85.0	85.6	85.7	85.7	86.0	85.3	85.7	85.4	85.3	85.3	85.3
% Coloured	7.9	8.0	7.7	7.8	7.8	7.7	8.0	7.6	7.8	7.8	7.8	7.9
% Asian/Indian	2.1	2.3	2.2	2.4	1.9	1.9	2.0	2.0	2.0	1.9	2.1	2.1
% White	4.8	4.7	4.5	4.2	4.6	4.4	4.7	4.6	4.8	5.0	4.8	4.7
% Age 20-25	26.6	25.8	26.6	26.0	26.4	25.7	26.5	26.1	26.7	26.1	26.7	26.0
% Age 26-35	31.7	31.7	31.9	31.9	32.2	32.6	32.0	31.7	31.3	31.2	31.2	31.0
% Age 36-45	23.6	23.9	23.5	23.8	23.3	23.2	23.3	23.6	23.3	23.5	23.4	23.8
% Age 46-55	18.1	18.6	17.9	18.3	18.1	18.5	18.3	18.5	18.7	19.2	18.6	19.2
% Urban	60.7	60.6	60.3	59.8	61.0	60.9	61.4	60.9	61.4	60.7	62.6	62.2
% Rural	39.3	39.4	39.7	40.2	39.0	39.1	38.6	39.1	38.6	39.3	37.4	37.8
% No education	21.1	21.6	19.6	19.8	17.7	18.1	15.9	16.4	15.1	15.3	14.1	14.4
% Primary edu.	52.8	53.1	52.0	51.9	52.5	52.5	53.3	53.4	53.1	53.0	52.4	52.3
% Secondary edu.	22.2	22.0	24.1	24.2	25.0	24.7	25.8	25.6	26.7	27.0	27.8	28.0
% Tertiary edu.	3.9	3.3	4.3	4.2	4.9	4.8	5.0	4.7	5.1	4.7	5.6	5.4

Source: Own calculations using 2008Q1-2013Q4 QLFS data (Statistics South Africa, various years).

Notes: This table shows the raw subsample sizes and weighted subsample compositions (in terms of baseline race, age, geography and educational attainment) of the QLFS cross-sections and quarter-to-quarter matched panels of male/female individuals that were aged 20-55 and not in formal sector employment in quarter t, pooled per year over 2008-2013. As such, the panel subsamples correspond to the subsamples that feature in the regressions of Table 6 in the main text. All percentages are weighted using either cross-sectional weights, that calibrate the samples to population totals and account for non-response, or panel weights, that also account for attrition between quarters t and t+1.