Southern Africa Labour and Development Research Unit

DataFirst

Job Creation and Destruction in South Africa

by
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Working Paper Series
Number 92

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We thank Naume Malepe and Mandla Masemula of Statistics South Africa for their help in explaining the QES data and sampling procedures. We are grateful for helpful comments from participants at the SALDRU seminar, University of Cape Town, the Firms and Labour Markets conference, University of Oxford and the Micro-econometric analysis of South African data conference, Durban. This research was made possible by an exploratory grant awarded by the Private Enterprise Development in Low-Income Countries (PEDL) research initiative. PEDL is a joint research initiative of the Centre for Economic Policy Research (CEPR) and the UK Department For International Development (DFID). It aims to develop a research programme focusing on private-sector development in low-income countries.

This is a joint SALDRU and DataFirst Working Paper.

Recommended citation

Kerr, A., Wittenberg, M., Arrow, J. (2013). Job Creation and Destruction in South Africa. A Southern Africa Labour and Development Research Unit Working Paper Number 92. Cape Town: SALDRU, University of Cape Town

ISBN: 978-1-920517-33-5

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Printed copies of Working Papers are available for R15.00 each plus vat and postage charges.

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Job Creation and Destruction in South Africa

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28 January, 2013

Abstract

Analysts of the South African labour market have predominantly used household surveys to analyse the labour market. It has been more difficult to explore labour demand from the firm side, as a result of limited data from relatively small cross sectional firm surveys, mainly funded by the World Bank. We use the Quarterly Employment Survey conducted by Statistics South Africa that allows us to explore how South African enterprises create and destroy jobs, shedding light on many of the policy questions that are relevant in a high unemployment society like South Africa. We find job creation and destruction rates are similar to those found in OECD countries. There is little evidence that labour legislation creates rigidities that prevent firms from hiring or firing workers. We also find that larger firms are better net creators of jobs than small firms and that net job creation rates are negative in manufacturing, consistent with work using household surveys. Our research has important policy implications- particularly for the National Planning Commission's suggestion that new jobs will come mainly from small and medium sized firms. Our research suggests this is not likely without changes to policy or legislation.

1 Introduction

The labour market in South Africa has received considerable scrutiny in the post-Apartheid period, partly as a result of the stubbornly high levels of unemployment, poverty and inequality but also because of the release of substantial amounts of micro data from household surveys undertaken by Statistics South Africa and academic researchers. Much of this analysis has been on

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the labour supply side and has used cross-sectional household surveys, exploring changes in participation and employment (Casale et al. 2004), as well as poverty and inequality (Özler (2007), van der Berg and Louw (2004)). The availability of household-level panel data has widened the scope of research, allowing researchers to explore mobility and labour market transitions (Cichello et al. (2005), Banerjee et al. (2008)), as well as the importance of unobserved heterogeneity in explaining earnings differentials (Badaoui et al. (2008), Kerr and Teal (2012)).

There have been some firm surveys conducted by academics and international organisations in South Africa, but these have been small, cross sectional and limited to specific regions (Edwards et al. (2008), Valodia and Velia (2006)). These firm surveys have been used to estimate elasticities of substitution between capital and different kinds of labour (Behar 2010a), and the complementarity or substitutability of labour of different skill levels (Behar 2010b).

What is so far missing from the analysis of the South African labour market is any exploration of the dynamics of labour demand. This requires firm level panel data. Statistics South Africa and its predecessors have collected firm level data for several decades but the micro data from these surveys has never been released.

In this paper we provide the first analysis of firm-level panel data in South Africa, exploring the extent of job creation and destruction in South African firms. Our data comes from Statistics South Africa. We use the Quarterly Employment Survey data, which contains employment information on a nationally representative sample of enterprises, from 2005 to 2011[1].

Statistics South Africa collects data at the enterprise level, rather than at the establishment level. This reflects total employment across all establishments owned by the same enterprise. We explore the extent of job creation and destruction in enterprises, the roles of small and large enterprises in job creation and destruction, the contribution of enterprise deaths to job destruction and enterprise births to job creation and the variation in job destruction and creation over the business cycle. We find that small firms both create and destroy more jobs than large firms, but that net job creation is higher in the largest firms. This finding is qualified both because there is undercoverage of firm births in the data we use and because our data precludes us from exploring job creation and destruction in all informal firms and in the very smallest formal firms.

2 Literature Review

Recent empirical investigations of the demand side of the labour market using firm-level panel data have shown that the changes in total stocks of employment are much smaller than the employment flows over the same period (Davis et al. (1996), Haltiwanger et al. (2008), OECD (1996)). The work of Davis et al. (1996) in exploring job creation and destruction in US manufacturing plants was a major catalyst to a large research agenda exploring which employers

[1]This data is confidential but our use of it is not exclusive.

create and destroy jobs and how this process varies over the business cycle and with firm characteristics. In this literature a strong emphasis is placed on the changes in firm- or plant-level employment. Aggregate employment usually changes relatively slowly but this masks large changes at the firm level. Some new firms start up and grow, whilst other firms shrink or die, emphasising the importance of heterogeneity at the firm level (Melitz 2003).

Job creation occurs in firms that expand employment or in new firms whilst job destruction occurs in firms that contract their level of employment or by the death of a firm that closes down. Gross job creation rates of around 9% per annum were found by Davis et al. (1996) in their work in US manufacturing plants during the 1970s and 1980s, whilst gross job destruction rates were around 10% per annum. Thus job reallocation rates, the sum of job creation and job destruction rates, were around 19% per annum. These very high rates of reallocation suggested a very dynamic economy experiencing constant change, both growth and contraction, despite total manufacturing employment shrinking by around 1 percent per annum over the period investigated. This work also suggested that a substantial amount of job destruction occurred in quite severe contractions, as plant deaths were found to account for about 23% of job destruction in US manufacturing (Davis et al. 1996).

A more recent study by Haltiwanger et al. (2008) compared job creation and destruction rates across 16 OECD, transition and Latin American countries. Using firm, rather than plant-level, data the authors found even higher yearly job reallocation rates using data from all industries- around 25, 29 and 30 percent respectively in each of the three regions.

2.1 Job creation and destruction in sub-Saharan Africa

To answer questions about job creation and destruction is data intensive. It has only been possible with the creation of large scale firm-level panel data sets usually obtained from administrative data or large scale survey data created and funded by national statistics agencies. There is thus a paucity of data for developing countries suitable to explore this topic. In sub-Saharan Africa there are only a few papers exploring this question. Klapper and Richmond (2011) use data on Ivory Coast firms between 1977 and 1997, whilst Shiferaw and Bedi (2009) use a manufacturing census from Ethiopia in the 1990s and 2000s. The results from Ivory Coast suggest that average gross job reallocation rates are around 30% per annum over the sample period, whilst showing that firm entry and exit play a more important role in job creation and destruction than in OECD countries. Shiferaw and Bedi (2009) found that gross job reallocation rates were around 28% per annum in Ethiopia and highlights that in many ways the behaviour of Ethiopian firms is not that dissimilar to firms in OECD countries. It must be recognised that in both of these studies only registered, ie formal, firms are included, and that employment in formal firms comprises a very low fraction of total employment, which is mainly concentrated in subsistence agriculture and informal self-employment (Kingdon et al. 2006).

Sandefur (2010) uses two waves of the national industrial census from Ghana to explore the evolution of the size distribution of firms. In the process job creation and destruction rates are also calculated. The NIC surveys all formal and informal manufacturing firms, but household businesses are included only if there is a public sign pointing to the location of the enterprise. Given that he uses only two waves of data 16 years apart, stringent assumptions are required to obtain yearly job creation and destruction estimates. The author finds much higher rates of job reallocation in smaller firms, but also higher net growth in smaller firms, consistent with a large reduction in average firm size between the two waves of the census. Sandefur (2010) argues that small firms do create more jobs in Ghana, and that previous work did not find this because the work used data that did not include entry of new firms, which are predominantly small. This is an important issue in the data we use and we discuss this further below. The question over whether small or large firms create more jobs is a controversial question, which we address in the following section.

2.2 The role of small firms in Job Creation

One of the more contentious aspects of the job creation and destruction literature is whether small firms are responsible for the creation of many or most of the new jobs created, as Birch (1987) had argued using US data. Davis et al. (1996) argued, using data on US manufacturing plants, that while small firms do create many new jobs, they also destroy many jobs, with the main finding being that there is no systematic pattern between net job creation rates and the average size of plants in the US. As a result of the much bigger amount of employment in large firms, these large firms dominate job creation in US manufacturing, even though net job creation rates are no higher in larger firms. Recent research suggests that across all sectors in California small firms may actually be better employment creators (Neumark et al. 2008), but that this may not hold in manufacturing, potentially reconciling the findings of Davis et al. (1996) and Birch (1987).

Davis et al. (1996, pg. 62-70) note that part of the reason for the belief that small firms are responsible for much of the net job creation in the US is that the calculations performed by Birch (1987) and others do not take account of the migration between size categories of firms, use "share of net job creation" statistics in a misleading manner, and suffer from the regression to the mean fallacy because base year employment levels are used to calculate job creation rates. To get around the first and third errors Davis et al. (1996) suggest using average size over the sample period, which we follow in our analysis below.

Hijzen et al. (2010) use UK enterprise level data to explore these issues, although they have data on all enterprises, not just manufacturing, and the administrative data used covers firms contributing to around 95% of total UK employment. They find that the fraction of jobs created by small firms is substantial, around 65% of gross job creation in their preferred method of measuring firm size. However they do not answer the question as to whether net employment growth was higher in small or large firms.

The South African National Planning Commission's National Development Plan expects that small and medium sized firms will play an important role in job creation over the next twenty years (National Planning Commission 2011, pg. 114). The QES data provide an opportunity to explore whether this is indeed possible based on past employment outcomes. The QES can only be used to explore job creation and destruction in registered firms, however, since the sample frame is based on the Business Register maintained by Statistics South Africa. Thus we are unable to explore job creation and destruction in informal, unregistered firms.

There may be significant job creation occuring in informal firms but we cannot measure this. However Cichello et al. (2012) find that casual and self-employment, both of which are much more likely to be in informal firms not included in the QES, are much less stable than regular, formal employment. Banerjee et al. (2008) obtain similar results using the LFS panel, showing that the informally employed are much less likely to be informally employed six months later, compared to the likelihood that an individual with a formal job is still in a formal job six months later. This suggests that although job creation might be relatively high in informal businesses, job destruction is also higher. Unfortunately we cannot quantify this using the QES.

We explore the question of whether small firms create more jobs, finding that, with some caveats, it appears that larger firms have higher net employment creation rates in South Africa.

2.3 Do job flows shed light on rigidities in the labour market?

Recent research by Haltiwanger et al. (2008) sets out to explore whether labour regulations affect job reallocation rates. They argue that while there are models that predict that more stringent labour regulation reduces job reallocation rates this is an open question empirically. The data they use, from 16 countries, suggests that whilst industry effects and the size of firms can explain around half of the variance in job flows, there is evidence that more labour regulation reduces job flows, mainly through regulation's effects on entry and exit of firms. Thus our estimates of job reallocation rates may shed some empirical light on the rigidities present in the South African labour market.

Bhorat and Cheadle (2009) discuss the regulatory regime governing the South African labour market, finding that the level of regulation, as measured in the 1997 database, discussed by Botero et al. (2004), and the Cost of Doing Business survey by the World Bank in 2006, are not dramatically above the mean of the sample or the mean for countries with similar income levels. This does disguise some variation within different aspects of regulation. For example Bhorat and Cheadle (2009) note that South Africa scores highly (ie is more regulated) in the areas of firing costs, trade union power and the provision of unemployment insurance in the 1997 data, although the overall score is at the 30th percentile of labour regulation. By 2006 the CDB data suggests that the South African labour market had become more regulated, although the

country's position was still only at the 58th percentile in overall employment regulation. Interestingly in the CDBS South Africa had relatively high rankings in firing and hiring regulations.

Job creation and destruction measures from firm level employment data may also shed light on the perceived rigidities in the South African labour market. Rankin (2006, pg. 70) concludes that "on a national scale labour regulations constrain employment creation" and shows that firms that indicated that they were affected by labour market regulations grew less than firms that did not. However, Bhorat and Cheadle (2009) note that this and other work suffers from a lack of objective measures of the obstacles firms face. In using employment data in our enterprise panel we can explore the levels of job creation and destruction over time and whether these are much lower in South Africa than in other countries. We would expect that a more regulated labour market would experience lower levels of job creation and destruction, since firms would be much more cautious in taking on new employees and face more difficulties in firing workers they do employ.

3 Data

The Quarterly Employment Survey (QES) is a nationally representative enterprise-level panel survey administered every quarter by Statistics South Africa. The survey excludes agriculture and mining (the one digit SIC codes 1 and 2) and all unregistered enterprises. Mining employment is however included in the formal non-agricultural employment series P0277 produced by Statistics South Africa, with total mining employment figures obtained by Statistics South Africa from the Department of Mineral Resources (formerly the Department of Minerals and Energy). The sample frame for the QES comes from the business register which is kept up to date by Statistics South Africa using data from the South African Revenue Service (SARS), the Department of Trade and Industry and the Department of Labour [2]. Thus enterprises outside of mining and agriculture that were registered for VAT and Income tax with at least one of three indicators suggesting employment activity (paying unemployment insurance fund contributions, skills development levy or registered for PAYE) were included in the sample frame. Very small enterprises are also excluded because they are not required to register for VAT. In the first two samples enterprises with annual turnover of less than R300 000 were not required to register for VAT by SARS but this threshold was raised to R1 million in 2009 by SARS and thus affected the third sample that began in 2010.

Around 18 000 private sector enterprises were sampled in the first quarter of 2005 and followed for the next four quarters, which represented about 12% of the total number of registered private enterprises in the sample frame and around 50% of the estimated total private employment in registered businesses

[2] In addition, government departments, local municipalities, higher education institutions and extra-budgetary government institutions are also included in the sample but we ignore these in our analysis of job creation and destruction in section 4.

outside agriculture and mining. A new sample was drawn from an updated sample frame in June 2006 and this new sample consisted of just under 15 000 enterprises, including over 10 000 enterprises from the previous sample, as a result of sampling with certainty plants over a specified size that varied by SIC code. A new sample was drawn in March 2010 and consisted of over 17 000 firms, again with a substantial overlap with the old sample. The overlaps between samples mean that of the 28599 privately owned enterprises appearing in the data we use, 23% appeared in all three samples. We discuss attrition below.

The sampling procedure involved stratification on firm employment level based on information on employee numbers from SARS or on turnover if employee data did not exist. Firms were divided into size classes that depended on their SIC code. The largest firms in each SIC were sampled with certainty whilst the smaller firms were sampled with a probability less than one. Sample design weights were adjusted for non-response and we use these adjusted weights when looking at trends in employment in the QES and in the analysis of job creation and destruction.

The QES asked enterprises about the number of full-time and part-time employees, as well as a few other questions about gross earnings by all employees at the firm, the number of new employees and the number who had left in the previous quarter. We use the number of employees (both full-time and part-time) reported in the last month of each quarter for our analysis. The questions asked also allow for a standard industrial classification to be assigned to each enterprise. This is at varying degrees of disaggregation, partly to protect the confidentiality of enterprises, although most enterprises can be classified at the 3 digit level in the data we use.

The structure of the QES data and its relationship to the formal non-agricultural employment series P0277 released quarterly by Statistics South Africa is further illustrated in figure 1. Mining firms are not surveyed as part of the QES so the mining employment series comes from the Department of Mineral Resources. Government departments, local municipalities and universities are part of the QES sample and the employment in this group is shown in the "Public and University Employment" series. These two series, plus a weighted series of total private sector employment, contribute to the employment series P0277, which is approximated by the series "Total Weighted Employment". The series displays a discontinuity at the start of the second sample in June 2006, which is discussed, along with a revision of the series, in the Statistics South Africa March 2007 P0277 release (Statistics South Africa 2007).

In our analysis below we use only the private sector firms surveyed and explore job creation and destruction in the subset of these firms that reported employment. We exclude firm-wave observations where the employment level is imputed by Statistics South Africa. The benefit of using a large scale firm survey in which large firms are over-sampled is that a much larger fraction of formal sector employment is included in the sample and thus the non-imputed, non-weighted private sector employment from the enterprises we use in our analysis of the QES accounts for around 45-55% of total estimated private sector

employment. This also means that sampling error is much lower than that resulting from a household-based labour force survey[3].

3.1 Descriptive Statistics

Table 1 shows some descriptive statistics for each wave of the QES data. As mentioned above, there are three different sample periods in the data we are analysing. The average size of the enterprise sampled increases quite substantially between the first and second samples.

Table 2 shows further descriptives from the first wave of each of the three samples. At the 1 digit Standard Industrial Classification Manufacturing, Trade and Finance enterprises are most common. The second sample has a higher fraction of manufacturing enterprises. The first sample seems to have had more smaller enterprises than the second and third samples. The largest firms are a very small fraction of the firms sampled, but, as we show below, they contribute to a large share of (weighted) total employment. Firms from across the age spectrum are included in all three samples.

3.1.1 Births and Deaths

The percentage of enterprises with complete employment data is shown in Table 1 to rise after the initial wave and then decline, rising again at the start of the following two samples in wave 6 and wave 21. There are several processes contributing to declining levels of complete responses. Two important ones are enterprise deaths and enterprises that Statistics South Africa finds are "untraceable". However if an enterprise is sold or is the target of a merger then Stats SA also ceases to collect employment information, since this employment would be double counted in any analysis estimated total employment in all registered enterprises in South Africa, which is what the QES is primarily designed for, and thus these firms are also counted as not having responded.

Statistics South Africa recorded response codes in every quarter from all enterprises drawn for the three samples. These response codes enable us to distinguish between a death and a take over for firms that are taken over. Unfortunately it is not possible to identify the firms that are responsible for the take over. Thus these firms will "grow" following a merger but this is not really job creation, but the movement of employment from one enterprise to another as a result of a take over or merger. This problem affects any enterprise level analysis.

We use the QES response codes to classify enterprises as having experienced a death if they are coded as having closed down, been liquidated or are dormant and assign these observations zero employment. If an employment level in an enterprise for a particular wave is imputed by Statistics South Africa we set this value to missing for our analysis in this paper. Table 1 shows the number of deaths and percentage of completed responses with employment levels by wave.

[3] We discuss this further in the Appendix.

Firms deaths represent between .4% and 1.7% of the complete responses in any wave.

The sample is only refreshed twice after the initial sample was taken. These two waves, as well as the initial wave, are the only times when new enterprises could be included in the sample. As a result, enterprise births are undersampled in the QES. It also means there is an asymmetry between births and deaths in the data. Deaths can occur every quarter, whilst there are only 3 quarters in which births can enter the sample and contribute to the job creation numbers. Only two of these waves allow births to enter the job creation statistics, since we do not have data on any firms prior to the first wave, and even in the other two quarters the partial break with the previous samples means that births will be under-represented in the job creation statistics.

We have "year of registration" in the Stats SA data we use and classify an enterprise as a birth, and assign it an initial value of zero employees, if the year of registration was a year earlier than the year the firm first appeared in the sample This birth classification unfortunately only results in 295 births compared with over 3200 deaths, indicating that the under-counting of births is an important problem in the QES data.

To get around the under-counting of births we use the second and third samples to retrospectively impute births in the first and second samples respectively. If a firm appears for the first time in the third sample but has a registration date between 2004 and 2009 inclusive then we know that the firm was born during this period and should contribute to job creation from births in the year it was first registered. Similarly, if a firm appears for the first time in the second sample but has a registration date between 2005 and 2006 inclusive then we know that the firm was born during this period and should contribute to job creation from births during this period. This method generates an extra 1248 births in samples 1 and 2, meaning that in these samples we have 1507 births and 2299 deaths.

In imputing birth-related job creation we do not know each firm's initial employment level or how this evolved until the firm appears for the first time in the second or third sample. We make the simple assumption that the employment level of the firm in the first wave it is observed in the QES is the job creation that resulted from the birth, and we assign this level of job creation to the four quarters of the year in which the firm was first registered. This method does mean that we will overestimate the contributions of these births to job creation, since it is likely that firms grow after they are born. This method will not overstate total job creation, however, since a firm must have created X jobs by the time of the first wave it appears in the sample if it is of size X in that wave. Our method of imputation simply assigns X to job creation in the year the firm was born, rather than spreading it out over the intervening years.

The imputations discussed above solve the major part of the undercounting of job creation resulting from enterprise births in the first and second samples, although we cannot impute for the third sample. But under-counting job creation from births also occurs in the first and second samples because there will be firms that are born in these sample periods but then die before the third

sample is selected and whose job creation we will miss in using our imputation method. Unfortunately we are not able to do anything about this issue, but it will mean our estimates of job creation and destruction rates are biased downwards. In addition Van Biesebroeck (2005) notes that even in the US the manufacturing censuses are based on a business register that is a year out of date. For the QES data this means that firms born in 2008 or 2009 are much less likely to enter the business register and then be selected the third sample that began in 2010. We will be missing job creation coming from these new firms as well.

3.1.2 Enterprise Size

Figure 2 shows the weighted density of log of enterprise size for wave one of the QES. Figure 3 shows the same density for manufacturing enterprises only. Across all enterprises in the sample the median enterprise has 7 employees whilst in manufacturing the median manufacturing enterprise has 10 employees. Hsieh and Klenow (2011) present similar data for manufacturing in the US, Mexico and India, although they use establishment not enterprise-level data. They find that the median establishment employed 3 workers in India and 7 in Mexico (but 48 in the US). Table 1 in Sandefur (2010) shows that the industrial census suggests that the median manufacturing enterprise in Ghana employed between 1 and 4 workers in 2003. This suggests that the distribution of size in South African manufacturing is not too different to that in middle income or low income countries.

However, the differences become more apparent when we explore the size of the enterprise where the median worker works. The QES data suggests that the median worker in South Africa works in an enterprise with 140 employees, whilst when limiting the sample to manufacturing the median worker works with 155 other employees. This is substantially higher than the establishment level results of Hsieh and Klenow (2011), who find that the median worker in manufacturing worked in an establishment with 5 workers in India and 24 in Mexico, and higher than Ghana, where Table 1 in Sandefur (2010) shows that the median worker works in an enterprise with a size of between 20 and 29 employees. These differences are partly explained by the fact that we are using enterprise data, but it still seems true that the QES paints a picture of a much more vibrant large firm sector than other developing countries. What is lacking in South Africa, relative to other low and middle-income countries, and which helps to explain the large levels of unemployment, is employment in informal micro-enterprises and informal self-employment (Magruder (2012), Kingdon and Knight (2004).

The second column of Table 6 shows the weighted employment shares for all enterprises and for manufacturing only. Firms with more than 5000 employees employ over 20% of all those employed in registered businesses outside agriculture and mining. The share is much lower for manufacturing enterprises, the largest of which employ around 9% of all employees in registered manufacturing enterprises. The smallest category of enterprise employs only about 16% of the

total employment in the QES. Since Hijzen et al. (2010) use enterprise data this data is directly comparable with the QES. They find that firms employing less than 20 people account for 23% of total employment, higher than in the QES, although they also find a higher share of employment in the very largest firms compared to the QES results- about 21% of total employment in South Africa compared to 25% in the UK.

3.2 Non-response

We noted above that some firms do not report employment in every quarter. Of the roughly 440 000 firm-quarter observations we have, around 93 000 do not have an employment value. Not all of these are non-response, however. Around 32 500 are missing values following a firm death- so we know that a death has led to no employment being captured in the remaining sample periods. Another 19 000 are due to the firm being sold, reclassified outside the sample or the firm being found to be a secondary unit, in which case the firm's employment was not recorded and instead employment was collected at the parent unit to avoid Statistics SA double counting employment in its estimate of total employment.

In around 8 000 quarters firms were reported as having outstanding questionnaires but were not imputed and in around 3000 quarters firms were described as untraceable but were not imputed. This leaves around 31 000 quarters that were imputed. Only a small fraction of these were due to the response code "outstanding questionnaire." The rest are given imputation codes but without detail on why they were imputed. Discussions with the QES team at Statistics South Africa suggested these were also firms which did not return the questionnaire but which did not die. These imputations are spread over 9000 firms, with the median being 2 missing values per enterprises in those enterprises that did have at least one imputed employment value. Younger enterprises, medium sized enterprises and those with an SIC of trade were more likely to have an imputed value.

4 Analysis

In this section we explore job creation and destruction in the sample of QES firms.

4.1 Definitions

Following Davis et al. (1996) we define job creation at time t as employment gains summed over all enterprises that expand or start up between $t-1$ and t:

$$C_t = \sum_{i \in g^+} \Delta X_{it}. \tag{1}$$

We define job destruction as employment losses summed over all enterprises that contract or shut down between $t-1$ and t:

$$D_t = \sum_{i \in g^-} |\Delta X_{it}|. \tag{2}$$

To obtain job creation and destruction rates as a percentage of total measured employment of all firms in the sample we divide by the average of employment at t and $t-1$, following Davis et al. (1996). We only allow employment from a firm to contribute to this average if employment at time t and at time $t-1$ is not missing for a firm. Firms with missing employment either at t or $t-1$ cannot contribute to job creation or destruction so they should not contribute to the average level of employment used to calculate the job creation and destruction rates, otherwise we would have creation and destruction rates that would be too low. The alternative is to include in the denominator all employment reported in a particular quarter, irrespective of whether the same firm reported employment four quarters previously. This would be an underestimate of actual job creation and destruction. We do find job creation and destruction rates are around one percentage point lower than those reported below when using this alternative denominator.

We thus have a sample selection problem, in that we compute job creation and destruction rates for firms reporting employment in both quarters. This issue is particularly problematic at the changes between the samples. For the first four quarters of the second and third samples the job creation and destruction rates are calculated only for those firms present in the old and the new sample. This means that larger firms will contribute more than they should to estimates of job creation and destruction in these waves. This particular issue was solved by Davis et al. (1996) by imputing employment for firms included in a sample but not present in the wave prior to this sample. We have not undertaken this here.

Job reallocation is defined as the sum of job creation and destruction. Our estimates of job creation and destruction miss two important aspects of job reallocation, as is commonly pointed out in the literature (cf Davis et al. (1996) Hijzen et al. (2010)). First, our estimates miss out on any job reallocation that occurs within enterprises. Since we are not measuring job creation at the establishment or plant level, there may be substantial job creation and destruction within enterprises that we do not pick up in the QES enterprise data. If a retail enterprise closes one store and opens another of the same size, measured job creation and destruction will be zero in our data. We would require plant or establishment level data to measure this kind of job creation and destruction, but this is not currently collected by Statistics South Africa.

The magnitude of this omission may be quite large. Hijzen et al. (2010) find that plant level changes in employment would raise job creation and destruction rates in the UK by about 50%, ie that these plant level changes account for about one third of job creation and destruction.

Second, we will miss some job creation and destruction that takes place between t and $t-1$. We are measuring job creation and destruction at yearly

intervals, implying that changes that occur at enterprises within this period will not be captured by our job creation and destruction statistics. However, we do have quarterly data and focus on reporting yearly changes for every quarter, partly ameliorating this problem. We also briefly discuss quarterly job creation and destruction rates although our main focus is the yearly rates.

4.2 Estimates of Rates of Job creation and destruction

We have quarterly employment data from 28 quarters of the QES and explore job creation and destruction at yearly intervals in most of our analysis. Rates of job creation and destruction by wave are shown in Table 3. Job creation rates are about 9.9 % on average across the waves, whilst the job destruction rates suggest that, on average, around 10.5% of existing jobs are destroyed in a 12 month interval. This means that, on average, 20% of jobs are either created or destroyed over the course of a year.

This job reallocation figure is very similar to those calculated for US manufacturing plants by Davis et al. (1996), and is surprising given that South African firms rank labour regulation as a key regulatory constraint to business (Rankin 2006). It is also surprising given the omission of within enterprise job reallocation, which,as discussed above, would likely raise reallocation rates even further. Hijzen et al. (2010) find higher rates of job reallocation in UK enterprises, of around 28%, between 1997 and 2008. A more comprehensive study of enterprises in 16 countries by Haltiwanger et al. (2008) found gross reallocation rates of 25% in OECD economies, 28% in transition economies and 30% in Latin America.

This means that our estimates of job creation and destruction rates for South Africa are below those found in transition and Latin American countries. It should be recalled, however, that we are missing a substantial amount of job creation coming from births, and that this will raise our estimates of job reallocation rates, as we discuss below.

We calculate the contributions to job creation and destruction of births and deaths, shown in the final two columns of Table 3. Comparing the job destruction rates with and without deaths suggest that enterprise deaths contribute an average across all waves of 27% to total job destruction. This is higher than the results of other recent work using enterprise level data from the UK (Hijzen et al. 2010) and higher than the establishment-level results of Davis et al. (1996), who find 22% of job destruction coming from manufacturing plant deaths. Births contribute around 11% to job creation in the QES. This contribution of births to job creation that we calculate is substantially lower than the contribution of births estimated in the UK by Hijzen et al. (2010), who find that births contribute around 30% of job creation in the UK and lower than in US manufacturing plants where births were found to contribute to around 15% (Davis et al. 1996).

As mentioned above, our results are from a selected sample- those firms that reported employment at both time t and time $t-1$ (or quarter n and quarter $n-4$). This problem is most severe following the change to a new

sample. Thus our results reported in Table 3 in waves 6-9 and 21-24 are on a very selected sample- only those, mostly larger, firms that were selected in successive samples. We show below that larger firms have lower rates of gross job reallocation. This means that the average rates of reallocation we report in Table 3 are underestimating the rate of firm level job reallocation in eight of the 24 waves we report creation and destruction rates for. We believe that the average gross reallocation rate could be between 1 and 2 percentage points higher if we could observe job creation and destruction rates for all firms in all waves.

We also noted above that we cannot retrospectively impute births in the third sample. Our imputation of job creation from births also misses firms that were born in the first and second samples but died before the third sample was taken and our job creation estimates overstate the contribution of the births we do capture, as a result of assigning a firm's total observed employment at the start of the third sample to birth-related job creation in the year a firm was born. Thus our job creation estimates are further affected in all waves after wave 10, where it is obvious, from the 4th column of table 3, that our imputation methods are not generating anywhere near the actual amount of job creation coming from births. We believe that the average gross job creation rates would be between 1 and 3 percentage points higher if we were fully able to measure the job creation coming from births.

The large variation in birth contributions makes it very difficult to discern any trends across the business cycle. To remedy this the final column of Table 3 shows job creation without any births. This shows the pattern we would expect- relatively high rates of job creation and then a sharp decline following the recession that began at the end of 2008 (wave 16).

Although our main focus is on the annual data we can also use the QES to explore quarterly measures of job creation and destruction, shown in Table 4. These levels of job creation and destruction are around half those calculated in the yearly data. This difference in magnitude between the annual and quarterly rates is very similar to that reported by Davis et al. (1996).

Given the limitations of the data we use, we find job reallocation rates that are roughly similar to those OECD countries explored in Haltiwanger et al. (2008) and slightly lower than those found in transition and Latin American countries in the same study. This is perhaps surprising, given South Africa's reputation for a highly rigid labour market. It would be of interest to see if future work on other sources of data finds our results can be replicated.

4.2.1 Job creation and destruction in Manufacturing

We explore job creation and destruction in manufacturing enterprises in Table 5. Average job creation rates are lower than those in the full sample, with an average of nearly 9% of jobs being created in a 12 month period and nearly 10% being destroyed. Again these figures are only slightly lower than those from Davis et al. (1996). What is even more surprising is that the plant level figures comparable with Davis et al. (1996) are likely to be even higher.

Job creation is lower than job destruction in 15 of 24 quarters for which we can calculate job creation and destruction statistics in manufacturing, compared to only 13 quarters in the full sample, suggesting that there was slightly more prolonged destruction in manufacturing over the period and providing some evidence that manufacturing employment in South Africa is in decline. Enterprise deaths contribute around 25% of job destruction in manufacturing whilst births contribute around 11% of job creation. Part of this difference may come from the fact that even with our imputation method we cannot capture births adequately. Davis et al. (1996), however, also find deaths contributing a significantly higher amount to destruction than births do to creation (finding a contribution of 23% for deaths and 16% for births).

Table 7 further explores job creation and destruction in manufacturing at the 2 digit SIC level. There are 9421 manufacturing firms in the data but 50 of these are missing a 2 digit SIC code, which are then excluded from the analysis shown in this table. Job destruction is higher than job creation in all 2 digit sectors, except for food and beverages and electrical machinery. Enterprise deaths contributed more than 20% to job destruction in several of the 2 digit sectors, again suggesting that job destruction can be quite dramatic in manufacturing. This analysis reflects declining employment in manufacturing in general, illustrated by the fact that between June 2006 and December 2011 there was a decline in formal manufacturing employment, as measured in the QES, of about 7%.

4.2.2 Job creation and destruction by Enterprise size

Table 6 shows the rates of job creation and destruction by firm size categories, taking the average size over all waves the firm was observed and in which positive, non-imputed, employment was recorded, following Davis et al. (1996). Job destruction rates are significantly higher than job creation rates in smaller firms, implying that larger firms have higher net job creation rates in South Africa. When they are translated into actual employment numbers, these results mean, for example, that in the period between 2005 and 2011 the category of smallest firms contributed about 75 000 jobs to yearly gross job creation, but around 110 000 jobs to yearly gross job destruction. The largest firms contributed only around 60 000 jobs to gross job creation on average per year - but also only 37 000 to gross job destruction. The final column of table 6 shows the contribution to job destruction of enterprise deaths and suggests that enterprise deaths are much more important contributors to job destruction in smaller firms than in larger firms.

We mentioned above that birth related job creation is undercounted in the QES. Even if it were possible to better measure job creation from births, however. this would likely not be large enough to generate positive net employment creation rates in the small firms. Enterprise deaths contribute 35% to job destruction in the smallest enterprises and only around 7% in the largest enterprises. As a result of the lack of coverage of enterprise births we may be significantly understating the amount of job creation in small startups, in which

case we might see a pattern closer to that in other countries (cf Davis et al. (1996), Hijzen et al. (2010)) in which small firms both create and destroy jobs at higher rates than large firms.

When exploring manufacturing, in the bottom half of Table 6, the pattern is more similar to the US manufacturing pattern, with smaller firms having higher job creation and destruction rates than larger firms. The job creation rates would likely be even higher if there was better coverage of births, most of which would be small firms.

Our results suggest that the smallest firms are responsible for the highest rates of job destruction. If the QES allowed better capturing of births we would be likely to see even higher rates of job creation, particularly in the smallest firms. This would increase the net job creation in small enterprises. However, to generate even zero net job creation in the smallest firms, births would have to contribute around 45% of job creation, which is unlikely. This implies large firms would still have higher net employment creation rates. This has particular relevance to the South African National Planning Commission's National Plan for South Africa, which argues that the job creation required to make a substantive dent in the unemployment rate will come mainly from medium-sized and small firms (National Planning Commission 2011, pg. 93).

5 Conclusion

In this paper we have provided the first analysis of firm-level labour demand over time in South Africa, using the Quarterly Employment Survey data from Statistics South Africa to explore job creation and destruction. We have shown that job creation and destruction is an important feature of the demand for labour in South Africa, with enterprises creating or destroying around 20% on average of the total number of jobs in a 12 month period. This figure would be higher by perhaps one to two percentage points if we were able to include data for all firms in all waves, rather than only having data for large firms around sample changeovers, and if we had better data on firm births, which might raise job creation rates by between one and three percentage points.

Exploring this creation and destruction further we find that enterprise deaths contribute a substantial amount to job destruction, around 27% in all enterprises and around 25% when limiting the sample to manufacturing enterprises. Internationally, job creation and destruction rates are higher in smaller firms, although there is mixed evidence as to whether net job creation is higher in small firms. We find similar results as regards higher rates of job destruction in smaller firms but not job creation, likely as a result of under-counting births. We do find that net job creation rates are higher in larger firms, although an important caveat is that we are under-counting enterprise births. Nevertheless, we conclude that even if births were better captured, it is unlikely this would better the large and positive net job creation rates in the largest firms. This result suggests that the expectation of the South African National Planning Commission that small and medium sized firms will be the primary driver of

employment growth in the future is misplaced.

6 Appendix

6.1 The calculation of Standard Errors for Total Employment, Job Creation and Job Destruction

As was noted above the QES samples enterprises that constitute a large percentage of total formal employment outside of mining and agriculture. The larger enterprises are sampled with certainty but the QES is not a census because only a fraction of smaller enterprises are sampled. This means that our job destruction and creation rates are not measured with certainty, even if there was no measurement error by enterprises or during the data entry process. Davis et al. (1996, pg. 208) show how to calculate standard errors both for total employment and job creation and destruction. An alternative method is bootstrapping (Konings et al. 2003), which we do not follow here.

The estimated variance of the estimated employment change between two periods is given by Davis et al. (1996, pg. 209) as

$$s^2(\Delta\hat{X}) = \sum_{i \in E} W_{it}(W_{it} - 1)(\Delta X_{it})^2. \tag{3}$$

E is the universe of all enterprises, W_{it} is the weight of plant i at time t and ΔX_{it} is the change in employment at enterprise i between $t-1$ and t. It is clear that a similar formula will hold for calculating job creation and destruction estimates, which are also an estimate of a total.

In calculating this expression for the estimated variance of the sampling error of the change in employment from the estimated variance of total employment Davis et al. (1996) assume that the sample weights of plants in their sample do not change. However, they note that the sample weights do in fact change for some plants in an earlier period of the data they use but argue that this is a minor issue. Enterprise weights do change in the QES, although weights do not change for around 60% of enterprises. Thus we assume this expression is a good approximation of the estimated variance of the estimated employment change.

It is clear from equation 3 that plants with weight 1, ie those in strata sampled with certainty, contribute zero to the estimated variance. The intuition is that there is no uncertainty surrounding the total employment in these types of enterprises, they are all sampled and thus there is no sampling error. Since we have shown above that certainty enterprises contribute a large percentage to total employment sampling error will be quite low in the data, certainly lower than the standard errors of total employment estimated from a labour force survey.

Following Davis et al. (1996) we report relative standard errors for employment, job creation and job destruction in each wave of the data. These are calculated as the square root of the estimated variance (ie the standard error) of the relevant statistic, divided by the estimate of that statistic. Thus for total employment we show $s(\hat{X})/\hat{X}$, for job creation $s(\hat{C})/\hat{C}$ and for job destruction $s(\hat{D})/\hat{D}$. These are shown in Table 8. They imply that the standard errors on estimated total employment are less than .05% in all waves and that the job

creation standard errors are less than .15% in all waves. The standard errors on the gross job destruction are higher, but still less than 1% in all waves.

Table 1: Descriptive Statistics by Wave

Wave	Year	Sample	Avg Ent Emp	Sample Size	Positive Responses	Births	Deaths	% Complete Responses
1	2005	1	170.08	17974	15274	12	88	0.85
2	2005	1	159.65	17974	16290	0	151	0.91
3	2005	1	159.11	17974	16016	0	134	0.89
4	2005	1	156.30	17974	15714	0	102	0.87
5	2006	1	157.53	17974	15340	0	93	0.85
6	2006	2	213.13	14439	12216	144	86	0.85
7	2006	2	212.19	14439	12131	0	78	0.84
8	2006	2	216.31	14439	12498	0	137	0.87
9	2007	2	223.02	14439	12477	0	136	0.86
10	2007	2	245.53	14439	11812	0	136	0.82
11	2007	2	241.60	14439	12043	0	123	0.83
12	2007	2	253.77	14439	11774	0	87	0.82
13	2008	2	253.71	14439	11634	0	43	0.81
14	2008	2	258.29	14439	11596	0	197	0.80
15	2008	2	257.99	14439	11256	0	116	0.78
16	2008	2	268.92	14439	11154	0	159	0.77
17	2009	2	264.95	14439	10979	0	107	0.76
18	2009	2	263.65	14439	10882	0	95	0.75
19	2009	2	265.97	14439	10602	0	114	0.73
20	2009	2	274.09	14439	10479	0	55	0.73
21	2010	3	225.27	16985	14232	0	242	0.84
22	2010	3	224.91	16985	14581	0	143	0.86
23	2010	3	226.92	16985	14401	0	118	0.85
24	2010	3	234.80	16985	14022	0	106	0.83
25	2011	3	236.07	16985	13796	0	81	0.81
26	2011	3	238.09	16985	13674	0	82	0.81
27	2011	3	241.68	16985	13464	0	65	0.79
28	2011	3	245.04	16985	12721	0	52	0.75

Source: own calculations from QES.

Table 2: Further Enterprise Descriptive Statistics

	Wave 1	Wave 6	Wave 21
Industry Proportions			
Manuf	0.356	0.418	0.347
Utilities	0.003	0.009	0.008
Contruction	0.092	0.076	0.085
Trade	0.206	0.161	0.241
Transport	0.043	0.054	0.058
Finance	0.203	0.191	0.193
Services	0.097	0.090	0.069
Size Category Proportions			
1-19	0.395	0.324	0.295
20-49	0.207	0.201	0.207
50-99	0.150	0.170	0.176
100-249	0.142	0.161	0.171
250-499	0.055	0.074	0.078
500-999	0.027	0.037	0.038
1000-2499	0.014	0.019	0.022
2500-4999	0.006	0.007	0.008
5000+	0.005	0.006	0.005
Age Category Proportions			
0-5	0.136	0.133	0.067
6-10	0.279	0.271	0.208
11-15	0.137	0.147	0.237
16-20	0.096	0.093	0.116
21-30	0.154	0.078	0.128
31-40	0.079	0.144	0.151
40+	0.120	0.134	0.093

Source: own calculations from QES. Firm size is taken as the average of all quarterly observations of the firm.

Table 3: Job Creation and Destruction

Wave	JC	JD	Birth Contrib to JC	Death Contrib to JD	JC without Births
5	13.1	7.0	16.6	6.2	10.9
6	13.5	9.1	36.0	20.4	8.7
7	13.4	8.4	36.5	24.9	8.5
8	14.1	8.9	34.6	27.5	9.2
9	13.1	6.8	33.1	30.6	8.7
10	12.8	9.3	12.8	37.3	11.2
11	12.7	9.9	12.7	36.3	11.1
12	12.4	9.6	12.3	30.8	10.9
13	11.3	8.9	12.5	27.9	9.9
14	10.9	8.2	13.1	26.6	9.5
15	10.7	9.5	13.3	29.9	9.3
16	10.4	10.3	13.5	28.8	9.0
17	8.4	11.5	0.6	34.1	8.4
18	6.8	12.9	0.7	30.1	6.8
19	6.9	12.9	0.7	27.5	6.8
20	6.0	13.6	0.8	25.9	6.0
21	6.3	12.8	0.0	26.0	6.3
22	6.9	11.7	0.0	27.6	6.9
23	7.1	10.8	0.0	24.5	7.1
24	7.3	11.0	0.0	25.3	7.3
25	8.0	9.6	0.0	21.2	8.0
26	8.3	9.0	0.0	18.7	8.3
27	8.3	8.9	0.0	22.0	8.3
28	7.9	8.6	0.0	18.5	7.9
Average	9.9	10.0	10.4	26.2	8.5

Source: own calculations from QES. These are weighted results.

Table 4: Quarterly Job Creation and Destruction

Wave	JC	JD	Birth Contrib to JC	Death Contrib to JD
5	6.5	4.5	31.0	1.7
6	5.4	3.4	34.2	14.7
7	3.8	3.4	0.0	18.9
8	5.5	4.4	0.0	24.1
9	5.9	5.3	25.0	11.8
10	5.1	4.4	0.0	19.6
11	4.6	3.6	0.0	8.0
12	4.7	3.7	0.0	9.3
13	5.4	5.0	25.4	4.7
14	4.7	4.3	0.0	22.8
15	3.9	4.9	0.0	25.3
16	4.6	4.6	0.0	12.7
17	3.6	6.9	1.3	18.0
18	3.0	5.9	0.0	15.9
19	3.4	4.9	0.0	18.8
20	3.8	4.7	0.0	7.3
21	3.6	6.8	0.0	19.1
22	4.0	4.8	0.0	15.9
23	3.8	4.6	0.0	9.0
24	4.5	4.5	0.0	9.5
25	3.7	4.8	0.0	6.9
26	3.5	3.8	0.0	11.0
27	3.8	3.9	0.0	10.4
28	4.2	4.0	0.0	6.5
Average	4.4	4.6	4.9	13.4

Source: own calculations from QES. These are weighted results.

Table 5: Job Creation and Destruction in Manufacturing

Wave	JC	JD	Birth Contrib to JC	Death Contrib to JD
5	10.8	7.2	14.6	8.8
6	10.9	9.2	28.5	14.0
7	11.2	7.8	28.1	17.0
8	11.7	9.4	28.8	31.8
9	11.8	7.6	37.2	27.0
10	11.3	9.2	21.1	33.0
11	11.2	10.0	20.9	31.0
12	11.5	8.9	20.0	31.5
13	9.8	8.8	12.9	25.6
14	9.2	9.2	14.1	29.5
15	9.2	10.4	14.5	31.6
16	8.6	12.1	15.3	28.0
17	6.0	14.3	1.1	31.9
18	5.4	14.6	1.2	25.9
19	5.3	14.5	1.3	28.4
20	5.5	12.9	1.2	22.5
21	8.1	11.3	0.0	24.5
22	8.7	9.7	0.0	29.7
23	8.2	8.2	0.0	27.6
24	8.3	9.6	0.0	22.3
25	7.3	8.8	0.0	19.7
26	7.4	7.7	0.0	22.1
27	7.4	6.9	0.0	23.4
28	7.8	7.1	0.0	20.6
Average	8.9	9.8	10.9	25.3

Source: own calculations from QES. These are weighted results.

Table 6: Job Creation and Destruction by Size Category

Size Category	Weighted Emp Share	JC	JD	Birth Contrib to JC	Death Contrib to JD
1-19	16.2	10.1	14.3	11.8	34.4
20-49	15.6	12.2	12.2	12.7	33.3
50-99	11.2	9.7	13.0	5.5	22.3
100-249	10.3	9.6	11.3	7.2	28.3
250-499	6.1	10.4	10.9	9.2	26.9
500-999	5.9	11.2	8.6	10.0	16.0
1000-2499	7.3	11.1	8.3	11.0	16.9
2500-4999	6.4	12.5	6.9	10.9	11.8
5000+	20.9	6.7	4.0	10.3	7.1
Manufacturing Only					
1-19	12.9	9.6	13.5	9.4	32.7
20-49	14.7	9.9	11.5	9.1	31.4
50-99	13.1	9.1	10.4	8.1	25.9
100-249	16.0	9.4	10.4	7.5	28.3
250-499	11.1	8.1	8.8	7.1	22.9
500-999	7.6	9.2	8.1	9.6	18.9
1000-2499	10.0	7.5	7.2	14.8	10.0
2500-4999	6.6	9.5	7.5	21.4	6.6
5000+	8.0	6.0	5.4	13.9	0.0

Source: own calculations from QES. These are weighted results.

Table 7: Job Creation and Destruction by 2 digit SIC, Manufacturing

Two Digit SIC	JC	JD	Birth Contrib to JC	Death Contrib to JD
Food, Beverage, Tobacco	9.6	7.4	7.0	16.0
Textiles	6.4	12.7	6.8	25.4
Wood and Paper	6.6	10.1	7.8	29.9
Petroleum and Rubber	7.5	7.9	4.6	22.1
Non-metalic Minerals	8.0	11.8	10.1	27.0
Metals	10.0	9.7	9.8	23.3
Electrical Machinery	8.6	8.5	1.1	28.8
Communication and Medical	8.7	8.7	10.1	21.7
Transport Equipment	7.9	9.5	5.6	25.8
Miscellaneous	8.1	12.7	5.2	29.3

Source: own calculations from QES. These are weighted results.

Table 8: Relative Standard Errors

Wave	Total Employment RSE	Job Creation RSE	Job Destruction RSE
5	.0212	.0439	.0499
6	.02	.0363	.0733
7	.0205	.0368	.0806
8	.0213	.0382	.0765
9	.0206	.0374	.0546
10	.0202	.0324	.0594
11	.0192	.0288	.0508
12	.0191	.032	.0741
13	.0194	.0301	.0534
14	.0202	.0343	.0388
15	.0215	.0383	.0359
16	.0204	.0508	.039
17	.0212	.0681	.0477
18	.0208	.039	.0493
19	.0211	.0511	.0544
20	.0205	.0376	.0594
21	.0085	.0239	.0284
22	.0089	.025	.0256
23	.0089	.024	.0251
24	.0089	.0244	.0376
25	.0091	.0205	.0327
26	.0098	.0246	.0501
27	.0102	.022	.0512
28	.0102	.0255	.0633

Source: own calculations from QES.

Figure 1: Employment Totals from QES

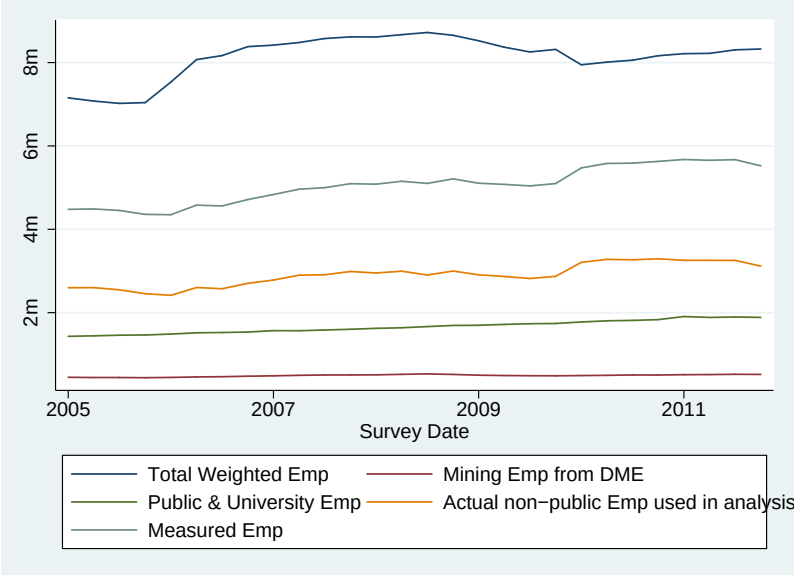


Figure 2: Enterprise Size Density

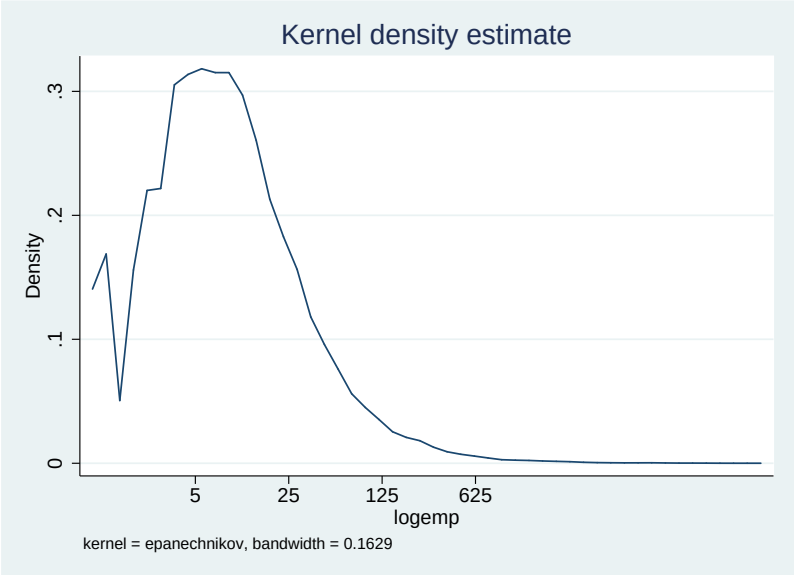
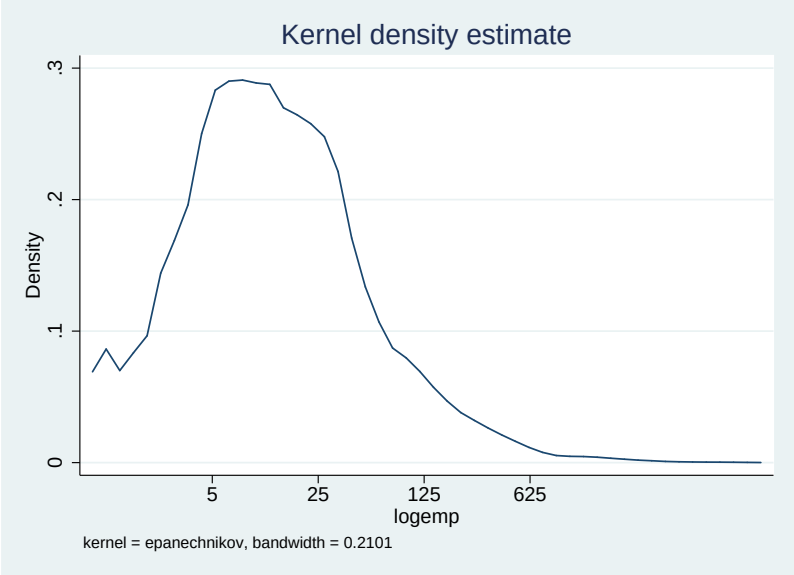


Figure 3: Manufacturing Enterprise Size Density



References

Badaoui, Eliane, Eric Strobl, and Frank Walsh, "Is There An Informal Sector Wage Penalty? Evidence from South Africa," *Economic Development and Cultural Change*, 2008, *56*, 683–710.

Banerjee, Abhijit, Sebastian Galiani, Jim Levinsohn, Zoë McLaren, and Ingrid Woolard, "Why has unemployment risen in the New South Africa?," *The Economics of Transition*, October 2008, *16* (4), 715–740.

Behar, Alberto, "Would Cheaper Capital Replace Labour?," *South African Journal of Economics*, 06 2010, *78* (2), 131–151.

_ , "Would More Skills Raise Demand for Those Who Do Not Get Them? Evidence from South African Manufacturing," *Journal of African Economies*, August 2010, *19* (4), 496–535.

Bhorat, Haroon and Halton Cheadle, "Labour Reform in South Africa: Measuring Regulation and a Synthesis of Policy Suggestions," Working Papers 09/139, University of Cape Town, Development Policy Research Unit September 2009.

Biesebroeck, Johannes Van, "Firm Size Matters: Growth and Productivity Growth in African Manufacturing," *Economic Development and Cultural Change*, April 2005, *53* (3), 545–83.

Birch, David L, *Job Creation in America: How Our Smallest Companies Put the Most People to Work*, New York: Free Press, 1987.

Botero, Juan, Simeon Djankov, Rafael Porta, and Florencio C. Lopez-De-Silanes, "The Regulation of Labor," *The Quarterly Journal of Economics*, November 2004, *119* (4), 1339–1382.

Casale, Daniela, Colette Muller, and Dori Posel, "Two million net new jobs? A reconsideration of the rise in employment in South Africa, 1995-2003," *The South African Journal of Economics*, 2004, *75* (2), 978–1002.

Cichello, Paul L., Gary S. Fields, and Murray Leibbrandt, "Earnings and Employment Dynamics for Africans in Post-apartheid South Africa: A Panel Study of KwaZulu-Natal," *Journal of African Economies*, June 2005, *14* (2), 143–190.

Cichello, Paul, Murray Leibbrandt, and Ingrid Woolard, "Labour Market: Analysis of the NIDS Wave 1 and 2 Datasets," SALDRU Working Papers 78, Southern Africa Labour and Development Research Unit, University of Cape Town 2012.

Davis, Stephen, John Haltiwanger, and Scott Schuh, *Job Creation and Destruction*, Cambridge, MA: The MIT Press, 1996.

Edwards, Lawrence, Neil Rankin, and Volker Schöer, "South African Exporting Firms: What Do We Know And What Should We Know?," *Journal of Development Perspectives*, 2008, *4* (1), 67–92.

Haltiwanger, John, Stefano Scarpetta, and Helena Schweiger, "Assessing Job Flows Across Countries: The Role of Industry, Firm Size and Regulations," NBER Working Papers 13920, National Bureau of Economic Research, Inc April 2008.

Hijzen, Alexander, Richard Upward, and Peter W. Wright, "Job Creation, Job Destruction and the Role of Small Firms: Firm-Level Evidence for the UK," *Oxford Bulletin of Economics and Statistics*, October 2010, *72* (5), 621–647.

Hsieh, Chang-Tai and Peter Klenow, "The Life Cycle of Plants in India and Mexico," Chicago Booth Paper No. 11-38 June 2011.

Kerr, Andrew and Francis Teal, "The Determinants of Earnings Inequalities: Panel data evidence from South Africa," CSAE Working Paper Series 2012-04, Centre for the Study of African Economies, University of Oxford 2012.

Kingdon, Geeta and John Knight, "Unemployment in South Africa: The Nature of the Beast," *World Development*, March 2004, *32* (3), 391–408.

_ , Justin Sandefur, and Francis Teal, "Labour Market Flexibility, Wages and Incomes in Sub-Saharan Africa in the 1990s," *African Development Review*, 2006, *18* (3), 392–427.

Klapper, Leora and Christine Richmond, "Patterns of business creation, survival and growth: Evidence from Africa," *Labour Economics*, 2011, *18* (S1), S32–S44.

Konings, Jozef, Olga Kupets, and Hartmut Lehmann, "Gross Job Flows in Ukraine: Size, Ownership and Trade Effects," CEPR Discussion Papers 3802 February 2003.

Magruder, Jeremy R., "High Unemployment Yet Few Small Firms: The Role of Centralized Bargaining in South Africa," *American Economic Journal: Applied Economics*, July 2012, *4* (3), 138–66.

Melitz, Marc J., "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 2003, *71* (6), 1695–1725.

National Planning Commission, "National Development Plan: Vision for 2030," 2011.

Neumark, David, Brandon Wall, and Junfu Zhang, "Do Small Businesses Create More Jobs? New Evidence from the National Establishment Time Series," NBER Working Papers 13818, National Bureau of Economic Research, Inc February 2008.

OECD, "Employment adjustment, workers and unemployment," *Employment Outlook*, July 1996, pp. 161–184.
ΩÖzler

Özler, Berk, "Not Separate, Not Equal: Poverty and Inequality in Post-apartheid South Africa," *Economic Development and Cultural Change*, 2007, *55*, 487–529.

Rankin, Neil, "The Regulatory Environment and SMMEs. Evidence from South African Firm Level Data," Working Papers 06/113, University of Cape Town, Development Policy Research Unit 2006.

Sandefur, Justin, "On the Evolution of the Firm Size Distribution in an African Economy," CSAE Working Paper Series 2010-05, Centre for the Study of African Economies, University of Oxford 2010.

Shiferaw, Admasu and Arjun S. Bedi, "The Dynamics of Job Creation and Job Destruction: Is Sub-Saharan Africa Different?," IZA Discussion Papers 4623, Institute for the Study of Labor (IZA) December 2009.

Statistics South Africa, "March release of P0277," 2007.

Valodia, Imraan and Miriam Velia, "Macro-Micro Linkages in Trade: Trade, Efficiency and Competitiveness of Manufacturing Firms in Durban, South Africa," *Journal of African Economies*, 2006, *15* (4), 688–721.

van der Berg, Servaas and Megan Louw, "Changing Patterns Of South African Income Distribution: Towards Time Series Estimates Of Distribution And Poverty," *South African Journal of Economics*, September 2004, *72* (3), 546–572.

southern africa labour and development research unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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