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Working Paper

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WIDER Working Paper, No. 2015/141

Provided in Cooperation with:

United Nations University (UNU), World Institute for Development Economics Research (WIDER)

Suggested Citation: Bhorat, Haroon; Naidoo, Karmen; Oosthuizen, Morné; Pillay, Kavisha (2015) : Demographic, employment, and wage trends in South Africa, WIDER Working Paper, No. 2015/141, ISBN 978-92-9256-030-0, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, <https://doi.org/10.35188/UNU-WIDER/2015/030-0>

This Version is available at:

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WIDER Working Paper 2015/141

Demographic, employment, and wage trends in South Africa

Haroon Bhorat, Karmen Naidoo, Morné Oosthuizen, and Kavisha Pillay*

December 2015

In partnership with



Abstract: This paper looks to uncover the growth traps and opportunities for the South African economy, with a focus on underlying labour market dynamics. We explore the potential of South Africa's demographic dividend. We also consider the structure of the labour market and the growth-employment interactions, which uncover the skills-biased labour demand path of the economy and a rising trend in the use of labour brokers to source temporary workers. Finally, we show a new labour market trend has emerged: a rise in the share of public sector employment along with higher conditional returns to public sector workers than to those in the private sector.

Keywords: South Africa, economic growth trap, labour market dynamics, skills-biased labour demand, demographic dividend

JEL classification: J11, J20, J45, L33

Acknowledgements: We are grateful for the research assistance of Aalia Cassim and Derek Yu.

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This study has been prepared within the UNU-WIDER project on 'Macro-Economic Management (M-EM)' as part of the Institute's collaboration with the Brookings Institution and the Development Policy Research Unit (DPRU) at the University of Cape Town on 'Understanding the African Lions: Growth Traps and Opportunities in Six Dominant African Economies'.

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ISSN 1798-7237 ISBN 978-92-9256-030-0

Typescript prepared by Leslie O'Brien for UNU-WIDER.

UNU-WIDER gratefully acknowledges the financial contributions to the research programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

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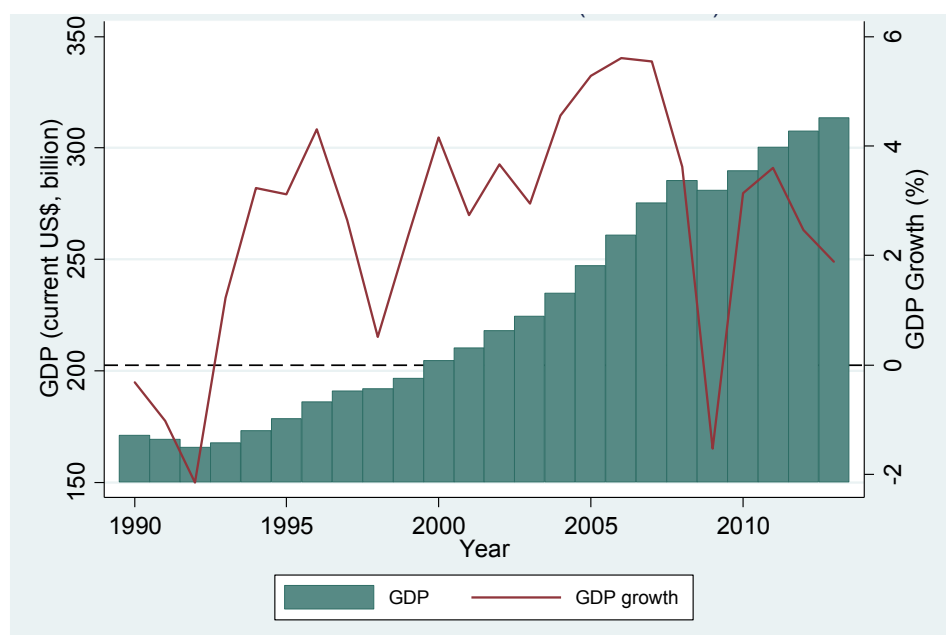
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1 Introduction

After negative and slow growth in the late 1980s and early 1990s, South Africa's triumphant transition to a democratic and more inclusive society in 1994 saw the economy once again begin to grow steadily. This renewed growth was supported by strong macroeconomic management and effective institutions. Since then, the South African economy has grown at an annual real average of 3.19 per cent. Accompanying this growth performance were significant welfare gains seen in the rise of access to social services, housing, and basic infrastructure, as well as a moderate reduction in extreme poverty (Bhorat et al. 2015b). One of the factors preventing greater development and welfare improvements is that economic growth has come with considerable variation, evident in Figure 1.

Figure 1: Real GDP and annual GDP growth (1990-2013)



Source: World Bank (2015); own graph.

In the five years immediately after democracy, growth averaged 2.76 per cent, rising to 3.17 per cent in the following five years (Table 1). The period of fastest economic growth was between 2004 and 2008, where real GDP expanded at an annualized average rate of almost 5 per cent. This period of relatively fast growth was then abruptly interrupted by the global financial crisis, which caused the South African economy to enter a brief recession in 2009.

Table 1: Real GDP and GDP per capita annual average growth rates (per cent)

	1994-98	1999-2003	2004-08	2009-13
GDP	2.76 (1.40)	3.17 (0.73)	4.92 (0.84)	1.91 (2.03)
GDP per capita	0.50 (1.43)	1.09 (0.78)	3.55 (0.83)	0.56 (2.00)

Notes: Standard deviations shown in parenthesis.

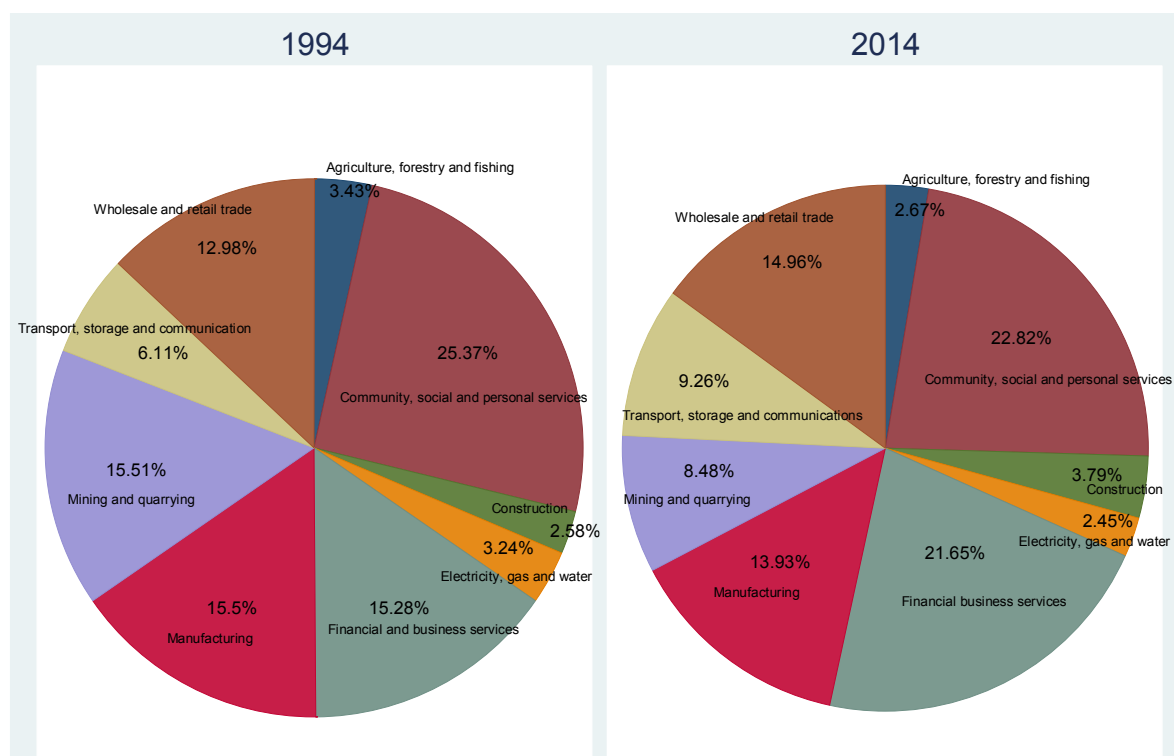
Source: World Bank (2015); own calculations.

National output subsequently rose to just over 3 per cent in 2010, but has since weakened. Over the last five years therefore, GDP per capita has grown at an annual average of merely 0.56 per cent. This weakening of the South African economy can ultimately be attributed to a combination of factors including slow global growth, industrial disputes, electricity shortages and

concomitant price hikes, a lack of international competitiveness in manufacturing, and declining gold, platinum, and coal prices since 2012.

A brief analysis of the sectoral composition (Figure 2) at two points in time show that four sectors are expanding relatively faster than overall GDP: transport, storage, and communication; financial and business services; construction; and wholesale and retail trade. Transport, storage, and communication is now one and a half times the size it was in 1994, financial and business services have expanded by 42 per cent over the period, and construction by 47 per cent. The remaining five sectors have all declined in their share of GDP.

Figure 2: Sectoral composition of GDP¹ (1994, 2014)



Source: South African Reserve Bank (2015); own graph.

The most marked change is that of the mining sector: from constituting up to 15.5 per cent of GDP in 1994, it is now almost half that proportion at 8.5 per cent. In addition, agriculture and manufacturing have also declined considerably in their shares of GDP, by 22 per cent and 10 per cent respectively. While the country has effectively transitioned away from its earlier reliance on the mining sector, mining remains an important contributor to economic activity. Most importantly, the sector generates more than half of the country's foreign exchange revenue and its firms account for a quarter of the national stock exchange market capitalization (Chamber of Mines 2015). Thus, exports are heavily concentrated in natural resources, where gold and other mining products make up 44 per cent of exports, a similar proportion to that of manufacturing (IDC 2013).

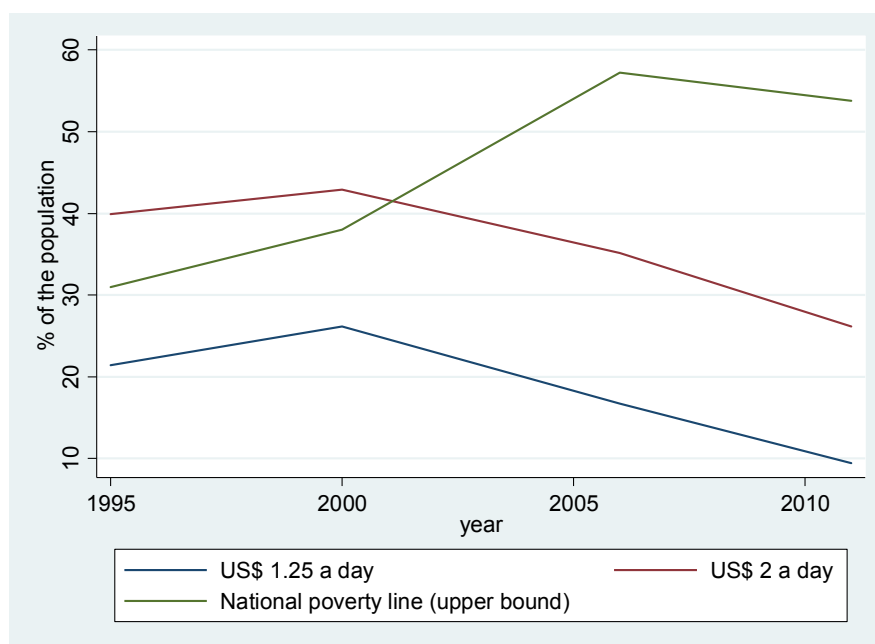
¹ In this figure and the rest of the paper, we use shortened names for the sectors. The sectors' full names are as follows: agriculture, hunting, forestry, and fishing; mining and quarrying; manufacturing; electricity, gas, and water supply; construction; wholesale and retail trade; transport, storage, and communication; financial intermediation, insurance, real estate, and business services; community, social, and personal services; and private households, extraterritorial organizations, representatives of foreign governments, and other activities not adequately defined.

Based on the sectoral composition of GDP then, it is evident that South Africa has become a service-driven economy since 1994. The share of output contributed by wholesale and retail trade, transport, and communication—and most visibly—financial and business services, show increases over the first two decades of democracy in South Africa. The economy, it is fair to argue, has slip streamed onto an economic development trajectory, which is increasingly intensive in the provision of services. What is most starkly evident in this deepening output from services however, is the stagnation in manufacturing. Hence, we find that the manufacturing sector's share of GDP has declined marginally since 1994 in South Africa. Since trade became more liberalized in the early 1990s, South Africa's manufacturing sector has failed to compete in global manufacturing export markets. Increased import competition, and the level and volatility of the real exchange rate have been shown to be important drivers of South Africa's manufacturing decline (Rodrik 2006). No country, to date, has managed to transition out of a middle-income to a high-income country status, without the dynamism of a vibrant, labour-intensive manufacturing industry. In the lexicon of post-apartheid South Africa, however, this notion of labour-intensive manufacturing as a driver of growth and jobs in the country is strikingly absent

South Africa is classified as an upper-middle income country, with real GDP per capita currently at USD5,916, up from USD4,652 in 2000. The uneven and at times sluggish growth in average income levels, however, has meant a moderate decline in poverty, from 40 per cent of the population in 1995, to 26 per cent in 2013 using the World Bank's 2 Dollar a day poverty line (Figure 3). With a current population of almost 53 million, this equates to about 13.7 million people living in poverty in South Africa. At perhaps the more appropriate national poverty line,² the poverty headcount ratio has increased from 31 per cent in 1995 to a current level of 53.8 per cent. This headcount ratio is calculated using the upper bound level of a newly rebased national poverty line, but even at the national lower bound headcount poverty rate of 37 per cent, poverty has undoubtedly remained high.

² The national lower bound poverty line is equivalent to USD3.50 (PPP) a day (StatsSA 2015). The national poverty line was updated in 2011 to make it more relevant to the current average basket of consumption goods.

Figure 3: Poverty headcount ratios over time (1995-2011)



Note: 1. All poverty lines are measured on a PPP basis.

2. The South African National Poverty Line is measured at the lower bound at USD3.50 a day and at the upper bound at USD5.43 a day (StatsSA 2015). These poverty lines were recently rebased by StatsSA so that they are reflective of a current average basket of food and non-food consumption items. The 2011 poverty headcount rate at the lower bound is 37%.

Source: World Bank (2015); own graph.

Thus, while extreme poverty has declined, the trends on the national poverty line are more worrying. South Africa's inability to translate growth into reducing poverty is not surprising given the extremely unequal nature of the society. With a Gini coefficient of 0.59, the exceptionally high level of income inequality is arguably the most important factor hindering the poverty reducing power of economic growth.³ The exclusivity of South Africa's growth path is only further emphasized by an unemployment rate of 25 per cent, and one that has averaged 23.7 per cent over the last two decades, with its lowest level at 17 per cent in 1995.⁴ South Africa is clearly in a labour market crisis, which in a low growth environment, serves only to reinforce further the unsustainably high level of income inequality.

Therefore, despite the optimistic outlook for the South African economy as the country transitioned to democracy in 1994, economic growth over the last two decades has been moderate. In addition, while the comprehensive social welfare system has succeeded in reducing inequalities in access to public services and housing, poverty has remained stagnant and inequality has remained exceptionally high—underpinned by one of the world's consistently highest unemployment rates. Given this all too brief background to the economy's growth record and the structure of this growth trajectory, the remainder of this paper focuses on demographic and labour market trends during the period, in order to understand better some of the factor market underpinnings of South Africa's economic performance.

³ There is a rich literature on the linkages between growth, poverty, and inequality which includes Kanbur 2005; Kanbur and Squire 1999; Kakwani 1993; Datt and Ravallion 1992; Ravallion 1997, 2001. Whilst this is an important area in the macroeconomics of growth and development, it is not the focus of this paper.

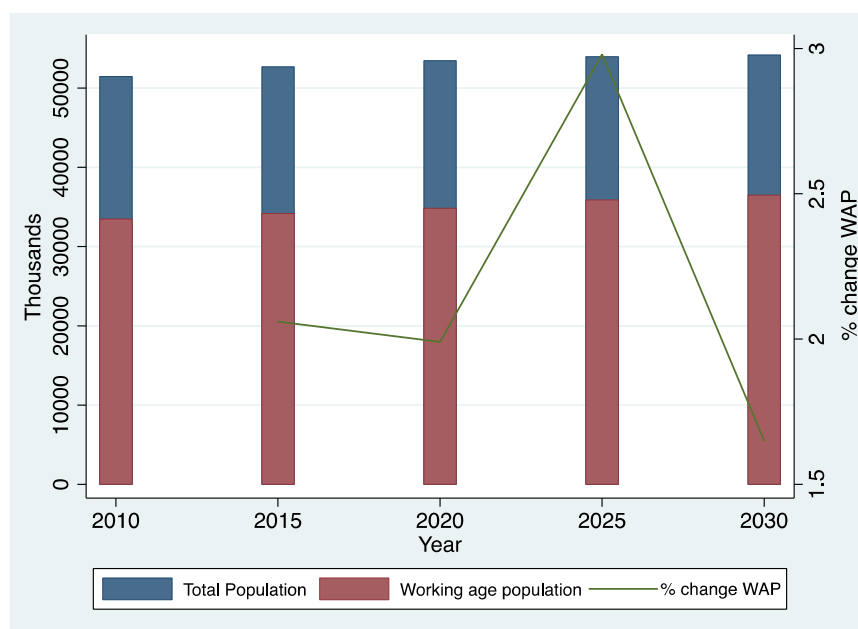
⁴ World Bank (2015), using national estimates.

2 Estimating South Africa's demographic dividend

The South African labour market has undergone considerable changes since the end of apartheid and the elimination of various statutory restrictions on labour market access and participation. The key feature of the latter half of the 1990s and the early 2000s was the rapid growth in the size of the labour force, driven by increasing labour force participation rates—rather than a rapidly growing working age population—particularly amongst rural African women (Casale and Posel 2002). For the 1995 to 2002 period, for example, growth in the working age population averaged 2.1 per cent per annum, which was less than half the rate of growth of the labour force (irrespective of the unemployment definition utilized) (Bhorat and Oosthuizen 2006: 145). As a result, although employment growth was able to keep pace with growth in the working age population and, largely, with economic growth, it was unable to keep up with the growth in the labour force. Unemployment thus moved rapidly higher, both in absolute terms and as a proportion of the labour force.

This disconnect between employment growth and labour force growth points to the importance of understanding the longer-term challenges and opportunities associated with demographic change. Projections from the United Nations Population statistics suggest that the share of the working age population (WAP) in the total population in South Africa will remain between 65-67 per cent until the year 2030 (Figure 4). Given slowing population growth rates, this means that the working age population is expected to increase gradually from the current 34.2 million to 36.5 million by 2030. South Africa is, therefore, quite some way along its demographic transition. In fact, the median age in South Africa has risen from 18 years to 25 years over the last three decades, and is estimated to rise to 31 over the next three decades as the population continues to age (Oosthuizen 2014).

Figure 4: Share of the WAP in the total population (2010-30)



Notes: 1. Medium variant projections.

2. The working age population is defined as those aged 15-64.

Source: Author's calculations using the UN Population Prospects (2012).

According to the National Transfer Accounts (NTA) framework, the shift from a high-fertility, high-mortality equilibrium to a low-fertility, low-mortality equilibrium—referred to as the demographic transition—is associated with two potential dividends that can contribute toward

longer term economic growth and development (Mason and Lee 2007; NTA 2013). The first demographic dividend is triggered by falling fertility rates—having been preceded by falling mortality rates particularly amongst children. This process helps to boost economic growth through lowering the extent of dependency on working age adults.

Typically, dependency is measured in terms of dependency ratios, namely the ratio of economically inactive cohorts to economically active cohorts (e.g., the total dependency ratio is the ratio of children under the age of 15 and adults aged 65 years and older, to the working age population). This one-zero switch between dependence and non-dependence, though, is not realistic, and is avoided within the NTA framework by calculating the support ratio. The support ratio measures the number of effective workers (a country's population-weighted per capita labour income profile), relative to the number of effective consumers (the population-weighted per capita consumption profile). A rise in the support ratio implies a relative increase in the number of effective workers and, therefore, a lower level of dependence.

Declining fertility leads to a reduction in the ratio of dependent children relative to non-dependent (i.e. earning) adults and is the underlying driver of the demographic dividend—defined as the rate of change of the support ratio—as it drives the support ratio higher. This raised support ratio implies an increase in the number of effective workers relative to effective consumers and thus income per effective consumer rises *ceteris paribus*. This in turn implies higher standards of living and an improved scope for human capital investment. Upon this foundation then, a second demographic dividend, achieved through capital deepening, can be realized if the benefits of the first dividend are invested in human, physical, and financial capital.

To express this more formally, we follow Mason and Lee (2007) and define the effective number of producers (L) and the effective number of consumers (N) as:

$$L(t) = \int \gamma(x)P(x, t)dx \quad (1)$$

and

$$N(t) = \int \phi(x)P(x, t)dx \quad (2)$$

respectively, where $\gamma(x)$ represents age-specific variations in productivity, and $\phi(x)$ represents age-specific variations in consumption, and $P(x, t)$ is the population of age x in year t . Income per effective consumer, $y(t)$, can then be expressed as the product of two factors:

$$Y(t)/N(t) = L(t)/N(t) \times Y(t)/L(t) \quad (3)$$

Here, the first term equates to the support ratio (SR) and the second represents mean income per worker (y_l), resulting in the following equation for income per effective worker:

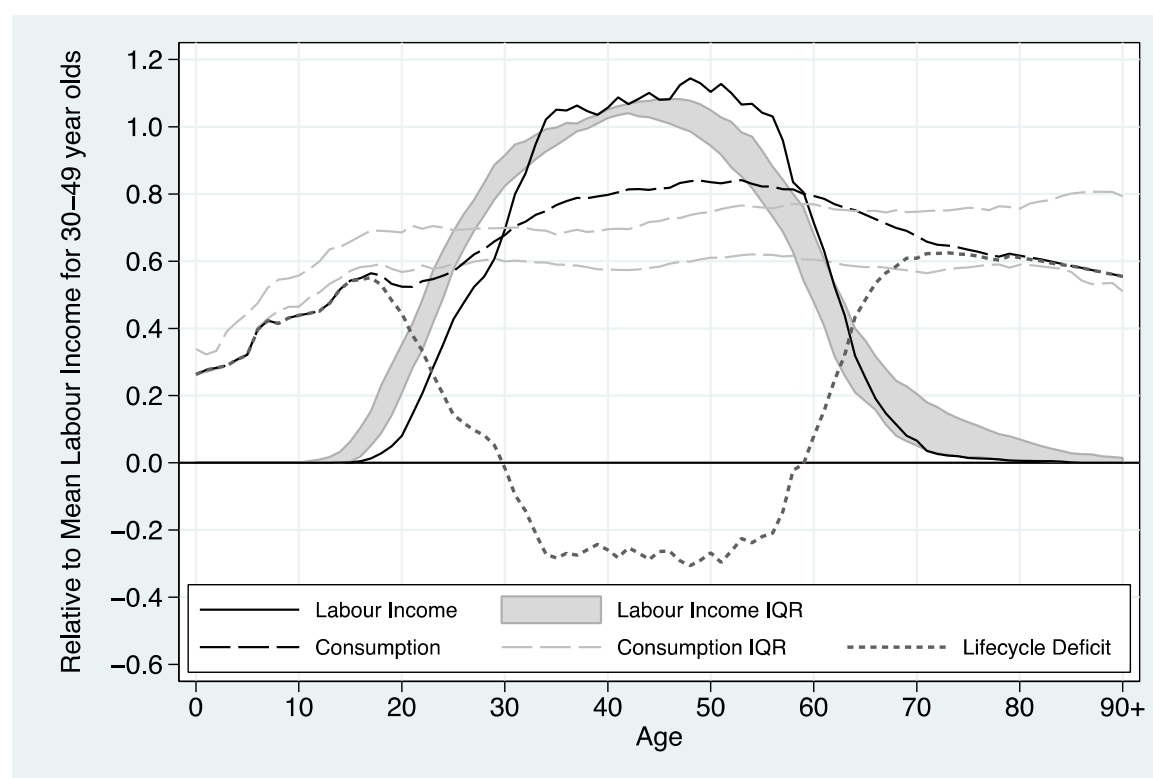
$$y(t) = SR(t) \times y_l(t) \quad (4)$$

A log transformation of the above equation allows us to express the equation as growth rates: $y(t) = \dot{SR}(t) + y_l(t)$. Thus, growth in income per effective worker is equal to the sum of the growth rate of the support ratio and the growth in income per worker. At the same time, the growth in the support ratio is expressed as the difference between growth in the number of effective producers and growth in the number of effective consumers. Therefore, the rate of growth of the support ratio is positive—and in turn so is the demographic dividend—when the number of effective producers grows more rapidly than the number of effective consumers does.

For South Africa, the average fertility rate has already declined significantly from 6.4 births per woman in the 1950s to 2.4 births in 2005-2010 (United Nations 2012). However, the high level of unemployment and the resulting low labour income—particularly for young workers—has significantly constrained the economy’s ability to reap the potential benefits of this demographic dividend. In addition to demographic change, both labour income and consumption are important factors influencing the rate of change of the support ratio and, therefore, the magnitude of the demographic dividend.

Figure 5 shows that labour income begins to rise at a later age and is markedly lower amongst young people in South Africa than in a range of other developed and developed countries. The interquartile ranges⁵ (IQR) of normalized labour income and consumption profiles across a variety of other countries are plotted in the graph using NTA data. In addition, per capita labour income is shown to fall significantly and more steeply for older working-aged adults in South Africa compared to the group of 33 other countries.

Figure 5: Per capita labour income, consumption and lifecycle deficit (2005)



Note: 1. Values are expressed as ratios to average per capita labour income at age 30-49.

2. For a list of NTA member countries, see www.ntaccounts.org.

Source: Oosthuizen (2014) using National Transfer Accounts (2013) data.

South Africa’s consumption pattern also differs quite significantly to other countries. Consumption for children and young adults in South Africa is positioned within the first quartile of the IQR of the other countries, but rises to the top quartile for those between the ages of 30 and 60 years. For older individuals in South Africa, consumption declines quite strongly compared to other countries where elderly consumption remains relatively stable. This decline in consumption amongst older cohorts in South Africa points to underlying weaknesses in the

⁵ The spread between the upper and lower quartiles of income and consumption for all the NTA countries, at each age.

private and public institutions that should allocate resources to ensure that consumption amongst the elderly is maintained at a level that is comparable to that amongst prime working-age cohorts (Oosthuizen 2014). Finally, evaluating income and consumption together, South Africa's lifecycle surplus period lasts 30 years between the ages of 30 and 59 years, which is broadly typical of NTA countries, albeit slightly delayed.

Estimates of the first demographic dividend for South Africa show that the country has passed through at least half of the period in which the first demographic dividend is expected to be positive, and is now in the stage during which the magnitude of the dividend is falling (Figure A1, see Appendix). The magnitude of South Africa's demographic dividend is in line with other middle-income countries: Over the 2005-10 period, the annual growth in the support ratio ranged between 0.15-0.40 per cent, compared to an average of 0.40 per cent for a group of 12 other upper-middle income countries for which there are NTA estimates (Mason and Lee 2012, as quoted in Oosthuizen 2014).

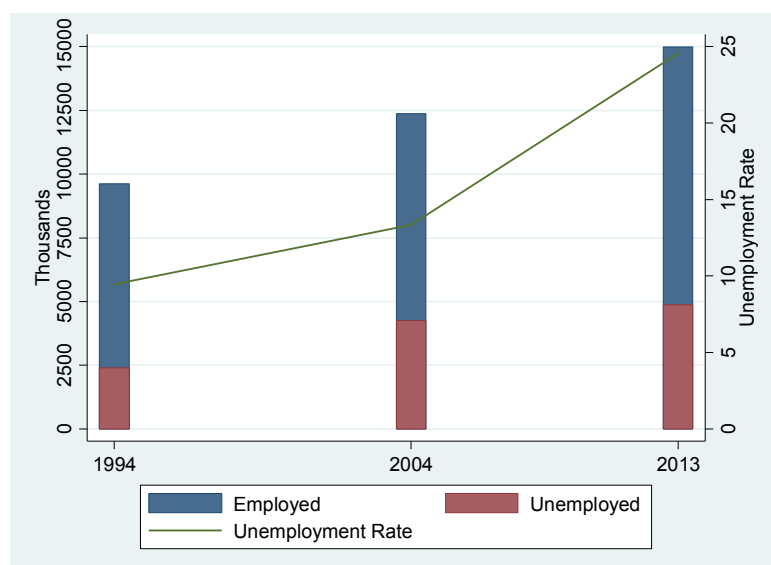
The continuing weaknesses within the South African labour market and the historical problems in the public provision of quality education to the broader population remain as one of the most significant challenges to realizing some benefit of the final phase of the positive demographic dividend over the next 30 years. Whilst the low level of employment and labour income of young South Africans is critical to address, a greater positive impact on the demographic dividend would be achieved if South Africa's consumption profile were similar to that of the median NTA country. As Figure 5 suggests, this would imply lowering the level of consumption of prime age adults relative to peak labour income to levels that are in line with international trends, while raising per capita consumption amongst the elderly. Underlying this finding is South Africa's relatively advanced point within the demographic transition: the youngest cohorts within the working age population are expected to stabilize in size and begin to contract, while older working age cohorts—which would comprise a relatively large proportion of effective consumers, given their high per capita consumption—are expected to grow rapidly. This suggests that weak sharing mechanisms within South African society may have a negative impact on per capita income growth over time (Oosthuizen 2014). In some sense, this provides support for the argument that inequality can act as a brake on economic growth.

3 Structure of the labour market and growth-employment interactions

The South African labour market has received considerable analytical and research attention over the past 15 years and as a result, there are a large number of labour market reviews covering the post-apartheid era (see, e.g., Burger and Woolard 2005; Bhorat and Oosthuizen 2006; Branson 2006; Oosthuizen 2006; Yu 2008). Instead of a detailed review of the post-apartheid labour market, this paper seeks to explore the particular trends relating to skills-biased labour demand, as well as to highlight two new more recent post-apartheid labour market trends. The latter is displayed in the rise, firstly, of temporary employment services as a form of alternative employment and secondly, in the sharp increase in the level of public sector employment.

The number of the employed in South Africa is currently just under 15 million individuals, rising from 12.4 million in 2004. This increase of 2.6 million over the last decade is equivalent to an average annualized growth rate of 2.3 per cent, with the most rapid growth occurring between 2004 and 2008, when the economy was growing at its fastest rate. Employment thus peaked at 14 million workers in the final quarter of 2008. The effects of the global economic recession, however, were felt heavily in South Africa, where the first three quarters of 2009 saw an estimated 900,000 jobs lost and by the end of 2010, the number of employed equalled 13.2 million (Oosthuizen 2011). Employment creation has since remained weak.

Figure 6: Employment and unemployment (1994, 2004, and 2013)



Source: PALMS dataset (DataFirst 2014); Labour Market Dynamics Survey (2013); own calculations.

The slow pace of job creation in South Africa over the last decade has meant the number of unemployed individuals has increased from 4.2 million in 2004, to a current level of 4.9 million by the narrow definition—an unemployment rate increase from 13 per cent to 24 per cent. Since 1994, the number of unemployed has doubled (Figure 6). When using an expanded definition⁶ of unemployment, the current unemployment figure stands at 8.1 million, a 35 per cent unemployment rate. The economic challenges then become clear: labour intensive sectors have failed to grow at a rapid enough pace to absorb the rising levels of labour force participation and the growing working age population over time.

‘Simple’ elasticities of employment to GDP growth are provided in Table 2. The estimates indicate that over the entire 20 year period, employment increased on average by 0.64 per cent for every one per cent in GDP growth. The employment intensity of growth was clearly higher in the first decade after democracy than the second. Against other comparable economies, South Africa’s simple output elasticity of total employment is by no means an outlier (Bhorat 2012). Following this, there is no immediate evidence here that South Africa’s economy has a weak labour absorptive capacity (Bhorat 2012).

Table 2: Employment-growth elasticities (1994-2013)

Year	Employment ('000s)	Real GDP (USD m)	Employment-growth elasticities		
			1994-2004	2004-2013	1994-2013
1994	9 847	173 021.42	0.71	0.64	0.64
2004	12 342	234 667.86			
2013	14 983	313 465.97			

Source: StatsSA Labour Force Survey (LFS) (1994, 2004); StatsSA Quarterly Labour Force Survey (QLFS) (2013); World Bank (2015); own calculations.

Furthermore, relative to a small subset of countries, Bhorat (2008) shows that South Africa’s simple elasticity is relatively high. For example, fast growing economies (such as India and Malaysia) experienced a more moderate employment response to the high growth during the

⁶ This definition includes those who are unemployed and willing to work, but have stopped searching for jobs—also commonly referred to as discouraged worker seekers.

2001-05 period—South Africa’s estimate then was 0.60, while Malaysia and India were 0.47 and 0.25, respectively (Bhorat 2008). Of course, within South Africa’s high unemployment environment, consumption levels are likely to be less than optimal and there may be lower incentive for investment, which would work together to dampen economic growth. The wide-scale provision of social grants would partly serve to offset these effects. Clearly, there is a non-trivial two-way relationship between growth and employment. Arguably though, any development plan for South Africa needs to place economic growth at its core, with a focus on growth in labour-intensive sectors, in order for the benefits of growth and employment creation to be more equitably distributed.

3.1 Uneven sectoral shifts in employment

Table 3, shows that the South African economy has created about 2.5 million jobs over the 2001-12 period, with significant job losses in the primary sector. It is evident in the sectoral breakdown that the overwhelming majority of jobs in the other two sectors (84 per cent) have emanated from the tertiary sector. This is completely consistent of course with our output share analysis above.

Two additional sectoral shifts are crucial to note: first, job destruction in the primary sectors is very clear. Specifically, agriculture and mining together lost almost 72,000 jobs. One factor contributing to declines in agricultural employment over this period was the introduction of a minimum wage, in March 2003 (Bhorat et al. 2012). The poor performance of the mining sector can be attributed to a range of factors, including a strongly appreciating Rand in the mid-2000s, infrastructural constraints (such as rail transport), energy constraints, and the application of new mining laws in South Africa (OECD 2008). The more recent widespread strike action in the mining sector in 2010 and 2011 would have exacerbated the problems.

Second, consistent with the lack of dynamism in manufacturing, employment levels in the sector have stagnated. Hence, it is instructive that the South African manufacturing sector has generated just over 110,000 jobs over an 11-year period, yielding a relative employment growth rate of only 0.3 per cent per annum. In contrast, the relative employment growth rates of the Transport, Finance, and CSP services sectors all exceed 2 per cent per annum. Employment and growth generators in the South African economy since 2001 have been disproportionately located in the services sectors.

Table 3: Employment shifts by industry (per cent share in total employment), 2001 and 2012

	Growth (2001-2012)		Employment Shares		Share of Change ($\Delta E_i / \Delta E$) ^(b)
	Absolute	Relative ^(a) ($\% \Delta E_i / \% \Delta E$)	2001	2012	(2001-2012)
Primary	-719232	-2.6	0.15	0.07	-0.28
Agriculture	-514 468	-2.7	0.1	0.04	-0.2
Mining	-204 764	-2.2	0.05	0.02	-0.08
Secondary	537 376	1	0.2	0.21	0.21
Manufacturing	112 149	0.3	0.14	0.12	0.04
Utilities	10 774	0.5	0.008	0.008	0.004
Construction	414 453	2.5	0.05	0.07	0.16
Tertiary	2 720 821	1.6	0.63	0.71	1.08
Trade	513 572	0.9	0.21	0.21	0.2
Transport	288 364	2.1	0.04	0.06	0.11
Financial	782 108	2.8	0.09	0.13	0.31
CSPS	1 041 524	2.1	0.17	0.22	0.42
Private households	95 253	0.4	0.09	0.08	0.04
Total	2 497 763	1	1	1	1

Note: 1. CSPS stands for Community, Social, and Personal Services, which is predominantly made up of public sector employment.

2. ^(a) The ratio of the percentage change for each respective sub-sector and industry to the total overall percentage change in employment over the period (relative sectoral employment growth).

3. ^(b) The ratio of the percentage change in the share of employment to the overall change in employment over the period (share of change in employment). This measure shows, within each broad sector, where the sources of employment growth are. For example, employment in the tertiary sector is 1.08 times (or 108 per cent of) the level of employment in 2001, which is the sum of the changes for all the industries within this sub-sector. CSPS then is the greatest contributor to employment growth in the tertiary sector.

Source: Borat et al. (2014) using PALMS dataset (2012).

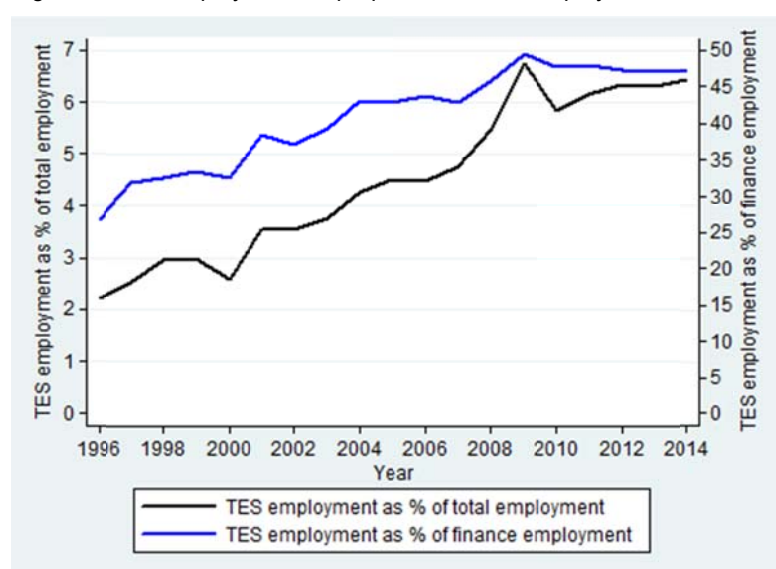
In terms of the share of this change in employment since 2001, the last column in Table 3 provides a key insight into the scale of this economic and employment shift. In particular then, we see that the CSP sector and the financial and business services, accounted for 73 per cent of the total employment shift in this period. As a result, the financial sector now accounts for 13.5 per cent of employment, from 10 per cent a decade ago (Table A1 in the Appendix). The CSP result suggests, in the first instance, that one of the biggest drivers of job creation since 2004 has been the expansion of employment in the public sector, which makes up the majority of community, social, and personal services. Hence, from contributing 17 per cent of employment in 2001, the broader industry now accounts for 22.5 per cent of employment, once again making it the largest industry by employment. Furthermore, public sector employment is the main driver of employment growth in the tertiary sector. This rising trend in public sector employment is an important focus of this paper, and is discussed in more detail in Section 4.

In essence, we observe important and new characteristics relative to the early post-apartheid years—job destruction in the primary sectors, a manufacturing sector that has been ineffective as a generator of large-scale jobs, and a tertiary sector that has stepped in to fill this vacuum. Employment has thus disproportionately emanated from the tradable and non-tradable services sectors. We turn next to a relatively new phenomenon characterizing job creation in South Africa, the rise of temporary employment services.

3.2 Rise of temporary employment services

In terms of the second largest sectoral contributor to the overall employment change, the financial and business services industry result is slightly more complex, given that this sector is not often a large generator of jobs. Disaggregating the sources of employment in the financial sector, reveals an interesting pattern—Employment growth in financial services is about growth in the business service colloquially known as ‘labour broking’ or, as it is known globally, temporary employment services (TES) provision. This statistical ‘hidden identity’ of the TES sector arises because the labour force survey data does not list TES as a separate sector, but houses it within the financial and business services sector, classifying it as the sub-sector ‘Business Services Not Elsewhere Classified (NEC)’. TES employment essentially involves the practice of companies providing, as a third party employer, workers across various occupations (such as cleaning, accounting, secretarial, security services, and so on) to formal sector firms. The latter then, do not directly hire these workers. TES employment as a percentage of the financial industry employment increased rapidly in the post-apartheid period in South Africa from 26.64 per cent in 1995 to 47.36 per cent in 2014 (Figure 7). As a proportion of total employment, whilst remaining quite small, TES employment has nearly tripled by increasing from 2.22 per cent to 6.44 per cent over the same period.

Figure 7: TES employment as proportion of total employment and finance employment (1996-2014)



Source: StatsSA October Household Survey (OHS) 1996-99; StatsSA LFS September 2001-07; StatsSA QLFS Quarter 4 2008-13; StatsSA QLFS Quarter 1 2014.

In order to understand where employment is actually created within the Business Activities Not Elsewhere Classified (NEC) sector, Table A2 (Appendix) presents the changes in the three main occupation groups⁷ within this sector for the period 1999 to 2014. Protective Services Workers Not Elsewhere Classified⁸ accounted for the relatively largest share of the employed in all three years, at between 43 and 47 per cent. The second largest share, at 15 per cent, was accounted for by commercial helpers and cleaners (as opposed to residential cleaners), highlighting the increased use of contract cleaners over this time. Lastly, by 2014, 6 per cent of those employed in

⁷ These are the main occupations in the first quarter of 2014.

⁸ The category specifically includes security guards, security patrolmen, security patrolwomen, bodyguards, coastguards, beach guards, lifeguards, beach patrolmen, beach patrolwomen, traffic wardens, game wardens, bird sanctuary wardens, wildlife wardens, taxi-guards, and traffic co-ordinators.

this sub-sector were categorized as Farmhands and Labourers, compared to an almost negligible category in 1999 (only 131 employed as Farmhands and Labourers). Whilst this employment category remains relatively small, Bhorat and Mayet (2012) point out that the rapid growth in this type of employment classification is reflective of increased labour broker recruitment in this area of work.

There are two possible explanations here. One is that these results suggest that the rapid expansion of employment related to protective and crime-prevention services is a response to South Africa's high crime rate. At another level, these results provide some powerful evidence of the rise of labour broking agencies that have for some time been an important topic of public debate in the country. In this debate, it is the burden of South Africa's regulatory environment that is often thought to be a central factor in the rise of TES employment. This form of employment, whilst not always offering lower direct costs of employment, often allow firms to circumvent the indirect costs of employment, thought to reside in the economy's labour regulatory environment (Bhorat and van der Westhuizen 2013).

In order to assess whether South Africa's scores on set of normalized employment protection legislation measures are indicative of an overly regulated or rigid labour market, Bhorat et al. (2015a) use the 2013 World Bank's Doing Business (DB) survey to provide a comparison of South Africa's measures of labour regulation against other regions of the world. As Table 4 indicates, low-income and high-income (OECD) countries exhibit the highest average scores of labour market rigidity, non-wage labour costs, and firing cost. Countries that lie between these two extreme income categories exhibit two distinct patterns. First, there is declining rigidity and firing cost as income level rises; and second, non-wage labour costs rise with income level as is expected.

Table 4: Mean measures of labour regulation by income level

Area of regulation	Low income	Lower-middle income	Upper-middle income	High-income: Non-OECD	High-income: OECD	South Africa	All countries
Difficulty of Hiring	50.89	35.28	30.40	17.79	27.72	55.67	33.13
Difficulty of Firing	36.88	33.96	25.60	16.25	22.26	30.00	27.95
Rigidity of Hours	19.38	18.33	14.00	16.67	24.52	20.00	18.16
Aggregate Rigidity of Employment Index	35.71	29.19	23.33	16.90	24.83	35.22	26.41
Non-Wage Labour Costs*	12.40	16.01	17.31	21.43	10.17	2.40	15.62
Firing Costs*	65.32	50.91	44.63	31.32	54.64	24.00	51.34

Notes: 1. * indicates results from the 2006 Doing Business Report, which focused on the jobs challenge and thus provided more detailed labour market indicators.

2. Regarding the consistency of South Africa's ranking over time, the 2013 results show no change in South Africa's relative position (compared to each country income-category and the global averages) in the aggregate rigidity of employment index from 2006 to 2013.

3. The 'difficulty of hiring' index measures restrictions on part-time and temporary contracts, together with the wages of trainees relative to worker value-added.

4. The 'difficulty of firing' index assesses and ranks specific legislative provisions on dismissals.

5. The 'rigidity of hours' index measures the various restrictions around weekend, Sunday, and public holiday work, limits on overtime, etc.

7. The 'firing cost' measures the cost of terminating the employment of an individual in terms of legislated prior notice requirements, severance pay, and so on.

Source: Authors calculations based on Bhorat et al. (2015a) and Benjamin (2010)..

South Africa's rankings for the firing costs and non-wage labour costs indices are both below its income-category (upper middle-income) means, and the global means. Whilst South Africa's difficulty of firing and rigidity of hours indices are above the respective income-category and global means, it is the difficulty of hiring index that stands out as remarkably high. Therefore, as Bhorat et al. (2015a) highlight, South Africa's labour legislation framework maintains a relatively flexible labour market in terms of hiring and firing costs, however, the legislated procedural requirements on hiring workers introduces a degree of regulatory inflexibility. Benjamin et al. (2010) argue, however, that the World Bank's *DB Survey* does not measure the inefficiency of the Labour Courts system, which potentially adds a very high cost to the firing of workers. Thus, it is arguably these degrees of inflexibility that firms can overcome through employing workers through labour brokers or temporary employment service providers.

3.3 Human capital and skills-biased labour demand

The rising shares of tertiary sector employment have implications for the underlying occupational shifts as they relate to skills levels. This section looks more closely at South Africa's educational profile and the economy's skills-biased growth trajectory in order to understand better the underlying implications for the labour market.

3.3.1 Weaknesses in South Africa's educational system

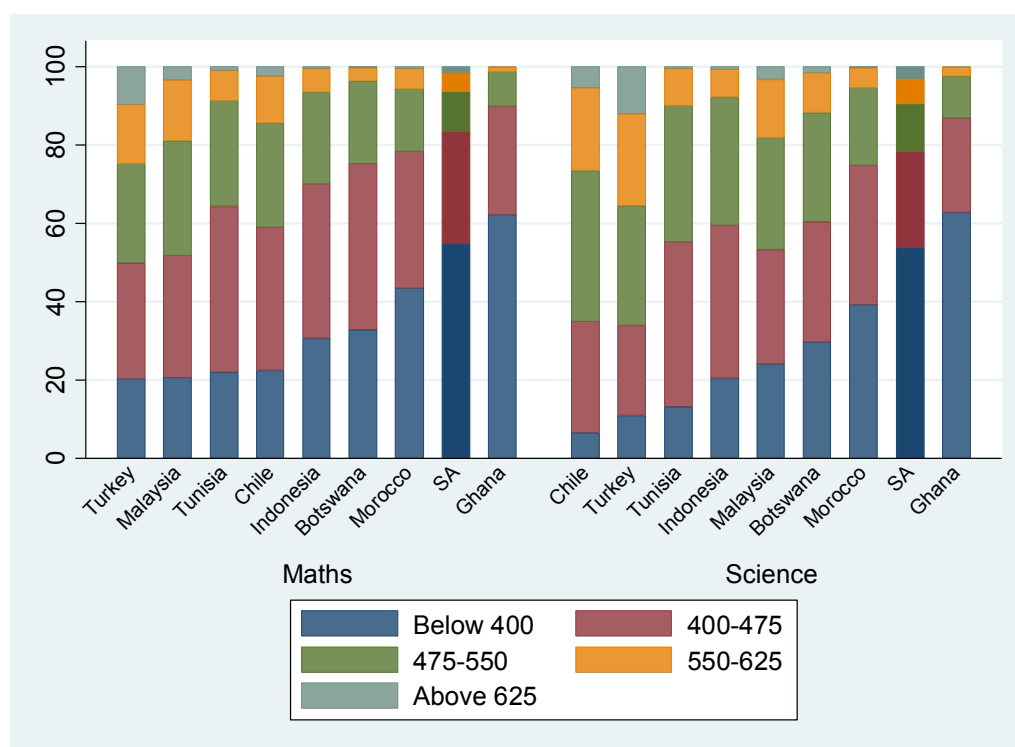
One of the fundamentally destructive legacies of the apartheid government's reign was a highly unequal schooling system and a tertiary system that was not accessible to those with poor levels of schooling. Whilst there have been enormous strides in the last 20 years to increase access to schooling, the poor quality of schooling in South Africa remains a critical challenge.

Enrolment in primary school in South Africa has reached almost 100 per cent, supported by a 'no-fee' policy for children from poor households, fulfilling the constitutionally enshrined right to basic education for all children. This is no doubt a positive development over time; however, the average quality of the schooling provided to all these children remains weak. Comparing the Grade 6 standardized Mathematics and Reading Scores from SACMEQ III⁹ for a number of African countries, South Africa's average for both subjects fall below many other countries such as Tanzania, Swaziland, Kenya, Botswana, and Zimbabwe, as well as below the African mean scores (Presidency 2014). In addition, using TIMSS data for Grade 8 students, we can compare the results of standardized Mathematics and Science tests. Figure 8 shows that South Africa does not compare favourably to comparator countries such as Turkey, Thailand, Botswana, and Chile, and is actually one of the worst performing countries. More than 50 per cent of Grade 8 pupils in South Africa score below 400 for Mathematics—the low international benchmark score¹⁰—and a mere 6 per cent score above 550 (the high international benchmark score). South African pupils perform equally poorly on the standardized Science test.

⁹ Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) III was undertaken from 2005 to 2010, targeted all pupils in Grade 6 level (at the first week of the eighth month of the school year) who were attending registered mainstream primary school. The desired target population definition for the project was based on a grade-based description and not age-based description of pupils.

¹⁰ According to the TIMSS methodology, four points in the overall subject scales are identified as international benchmarks: 400 is the low international benchmark, 475 is the intermediate international benchmark, 550 is the high international benchmark, and 625 is the advanced international benchmark.

Figure 8: Distribution of grade 8 mathematics and science by benchmark scores by country (2011)



Note: South Africa is denoted as 'SA'.

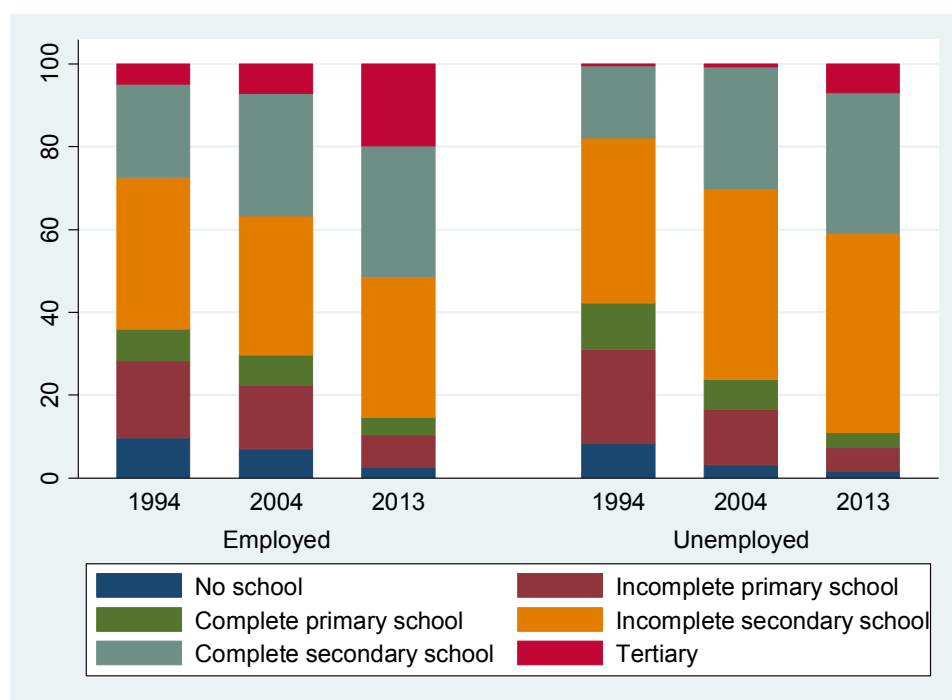
Source: TIMMS (2011); own graph.

As such, South Africa's education system is comprised of very high primary school enrolment rate, very low dropout rate before Grade 6, and low-level learning for those that do complete Grade 6 (Spaull and Taylor 2015). High levels of between-school inequality in learning outcomes have also shown to be strongly dependent on the socio-economic differentials, where clearly the South African schooling system—and poorer schools in particular—has not been able to overcome inherited socio-economic disadvantages (van der Berg 2006). Thus, for every 100 pupils that start school in South Africa, 50 make it to Grade 12 (final year of high school), 40 will pass, and only 12 will qualify for university (Spaull 2013). There is considerable education research to suggest that learning deficits are acquired early on, during primary school, and grow each year until they become insurmountable, leading to failure (and thus grade repetition), and eventual dropout during Grades 10 to 12. Research using two waves of the National Income Dynamics Survey panel data confirms the notion that grade repetition—a signal of learning deficits—is a key determinant of school dropout even after controlling for school quality and socio-economic status (Branson et al. 2013). Given the significantly positive returns to higher education in the South African labour market, it is not surprising that the extremely high levels of income inequality have persisted.

Clearly, the South African Government has found it difficult to influence the quality of education over time, which is evident in the numerous changes to the national curriculum. The outcomes-based curriculum was introduced in 2005, and due to implementation problems was replaced by various revisions between 2011 and 2014 (Presidency 2014). Some of the important supply-side challenges to educational outcomes over the last two decades have been related to the delivery of basic school materials (particularly textbooks) as well as the lack of establishing minimum standards for school infrastructure and teacher quality.

The country's education crisis has had important implications for the levels of human capital available in the workforce (Figure 6). There has been notable improvement: the proportions of those in the workforce with no education, incomplete primary school education, or completed primary education as their highest educational attainment have all declined substantially since 1994. However, the current educational profile of the employed shows that only 20 per cent has a post-secondary education and 32 per cent has a high school completion. Of the remaining half of the workforce, 70 per cent have an incomplete secondary education as their highest level of education. The South Africa workforce is at best a semi-skilled workforce (Figure 9).

Figure 9: Mean educational attainment by labour market status (1994, 2004, and 2013)



Source: StatsSA LFS (1994 and 2004); StatsSA QLFS (2013); own graph.

More worrying then is that one-third of the unemployed also have a complete high school qualification, a proportion that has risen from 17.5 per cent in 1994. These are individuals who, although have a basic level of education, do not possess the skills in demand in the workplace or are otherwise ill prepared for the work force. A further 48 per cent of unemployed are those who have dropped out of high school, most likely due to accumulated learning deficits as a result of being educated in poorly resourced schools, with poor teacher quality, and an inability to provide remedial classes to those pupils who most need it. The returns to these lower levels of education in the South African labour market remain low, which has wide reaching consequences for future generations of these unemployed individuals. This in turn will likely serve to perpetuate high levels of inequality as these individuals are excluded from the benefits of economic and employment growth, and perhaps also from accessing opportunities for self-employment.

3.3.2 Skills-biased labour demand

Table 5 explores the interaction between occupational skills and sectoral changes for the 2001 to 2012 period. A few key observations emerge. First, the primary sector lost more than half a million medium-skilled jobs and 175,000 unskilled jobs over the period, with no significant change in the number of high skilled jobs. Over the period, there was positive output growth in both agriculture and mining, which suggests then that an increase in the capital intensity of production resulted in the reduction of medium-skilled and unskilled labour.

Table 5: Changes in skills shares by sector (2001-12)

	Within Sector Shares (%)					Change over 2001-12:	
	2001	2004	2007	2010	2012	Percentage points	Numbers
Primary							
High Skilled	2.9	5.4	4.8	7.2	7.6	4.8	27 602
Medium Skilled	54.5	52.5	53.1	35.2	36.8	-17.7	-571 229*
Unskilled	42.6	42.1	42.1	57.6	55.5	12.9	-175 392*
Total	100	100	100	100	100		-719 232*
Secondary							
High Skilled	14.2	15.3	16.6	19	18.1	3.9	188 518*
Medium Skilled	69.8	64.7	63.6	64.2	61.5	-8.3	136 140
Unskilled	16	19.9	19.8	16.8	20.4	4.4	214 002*
Total	100	100	100	100	100		537 376*
Tertiary							
High Skilled	27.4	27.1	31.8	28.3	29.3	1.9	931 498*
Medium Skilled	41.8	41.5	39.8	42.6	42.6	0.8	1 214 349*
Unskilled	30.8	31.4	28.4	29.1	28.1	-2.7	576 288*
Total	100	100	100	100	100		2 720 821*

Notes: 1. The primary sectors include agriculture and mining; the secondary sectors include manufacturing, utilities, and construction; and the tertiary sector includes trade, transport, financial services, community services, and private households.

2. High-skilled workers include managers and professionals; medium-skilled workers include clerks, service and sales workers, skilled agricultural and fishery workers, craft and trade workers, and operators and assemblers; and unskilled workers include elementary workers and domestic workers.

3. See Table A3 (Appendix) for detailed data on the occupational shifts over the last 20 years.

4. * Denotes a significant change at the 5 per cent level based on a simple t-test in STATA.

Source: Bhorat et al. (2014) based on StatsSA LFS (2001-07); and PALMS (DataFirst 2014) data.

Second, the secondary sector saw an increase of about half a million jobs over the period, predominantly in high-skilled and unskilled employment. Therefore, while the proportion of unskilled workers in the sector rose significantly, it remains low at 20 per cent of employment. Medium-skilled workers continue to make up the large majority of employment in the secondary sector. Growth in employment was driven primarily by the construction sector, which was boosted by investment in infrastructure for the 2010 Football World Cup.

Finally then, it is clear that the tertiary sector was the largest creator of jobs between 2001 and 2012, growing by 2.7 million workers. While employment grew significantly across the skills spectrum, more than 70 per cent of the increase in jobs was associated with high- and medium-skilled employment. As a result, both the proportions of high-skilled and medium-skilled workers in the sector rose, while the proportion of unskilled workers marginally declined. By 2012, high-skilled workers accounted for just under 30 per cent of tertiary sector workers, while medium-skilled and unskilled workers accounted for 42.6 per cent—adding up to approximately three-quarters of the sector's workforce. Interestingly, the major occupational group within the TES subsector is Service and Sales workers—medium-skilled employees—which account for slightly less than half of overall TES employment (Table A4, Appendix). Therefore, TES employment growth has also been an important contributor to the shifting skills shares seen in the table above.

Overall, both the secondary and tertiary sectors witnessed a rise in the proportion of high-skilled employment, along with a rise in the proportion of medium-skilled employment in the tertiary sector. At the same time, the primary and tertiary sectors saw declining proportions of unskilled labour. It has earlier been shown that employment losses between 1994 and 2003 were likely due to skills-biased technological changes, as well as trade liberalization that accounts for some of the change (Bhorat and Hodge 1999; Bhorat 2001; Dunne and Edwards 2006; Bhorat et al. 2014). This trend seems to have continued over the last decade. In the context of a growing economy, it would suggest that firms are investing in capital and skills, causing the shift away from unskilled labour. The results show that whilst unskilled employment rose in both secondary and tertiary sectors, the proportion of unskilled workers rose only in the secondary sector. Both the primary and secondary sectors of the economy witnessed dramatically declining proportions of medium-skilled workers.

To have employment disproportionately favouring the skilled is a huge long-run concern for an economy like South Africa's, which has an excess supply of labour that is greater than most other emerging markets in the world, as well as serious challenges in improving access to and quality of secondary and higher education. It is clear that the tradable sectors have adopted production techniques that are increasingly capital intensive. Essentially, the mismatch between labour demand and labour supply goes to the heart of what is wrong with the structure of South Africa's growth pattern.

4 Role of the public sector in employment

Whilst the growth in TES employment is novel and involves regulatory avoidance, the rise of public sector employment has a much greater potential import for the future trajectory of the economy's employment path. Therefore, it remains the focus of the rest of the paper. Table 6 shows that the total number of public sector employments has increased from 2.16 million in 2008 to 2.69 million at the end of 2014—an increase of more than half a million jobs in a six year period. We further disaggregate public sector employment here into Government (national, provincial, and local) and State-Owned Enterprises (SOEs). Public sector employment is largely dominated by national, provincial, and local government, which has accounted for about 88 per cent of public sector employment over the period.

Table 6: Employment in the public sector (2008-14)

Year	Government	SOEs	Total	Year-on-year total change (%)	Share in employment index
2008 Q4	1 903 027	254 920	2 157 947		1.00
2009 Q4	1 912 965	265 561	2 178 526	6.79	1.07
2010 Q4	1 960 613	292 007	2 252 620	3.92	1.11
2011 Q4	2 104 959	281 393	2 386 352	2.72	1.14
2012 Q4	2 215 565	318 064	2 533 629	4.81	1.20
2013 Q4	2 328 769	319 749	2 648 518	0.00	1.20
2014 Q4	2 365 131	322 960	2 688 091	0.46	1.21

Notes: 1. 'Government' is comprised of national, provincial, and local government.

2. See Table A5 (Appendix) for quarterly public sector employment numbers for the 2008: Q1-2014:Q4 period.

Source: StatsSA QLFS (2008-14); own calculations.

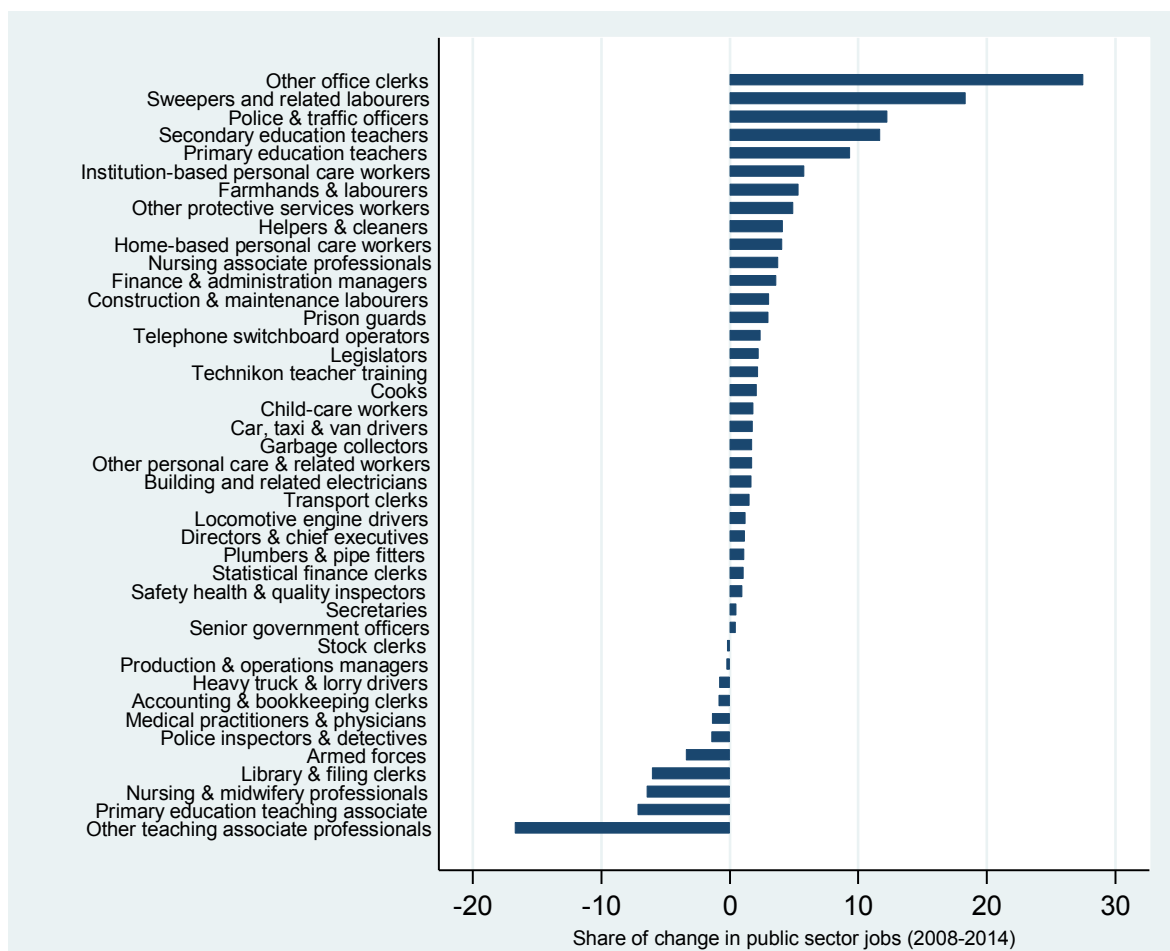
Therefore, from constituting 14.5 per cent of total employment at the beginning of 2008, the share of public sector employment has risen to 17.5 per cent by the end of 2014—which is 1.2 times the 2008 share. The data also makes it clear that the growth in public sector employment is

driven by employment in national, provincial, and local government structures, as opposed to employment in state-owned enterprises (Figure A1, Appendix). The latter has maintained a stable share in overall employment since 2008. Evident in the Table 5 and Figure 10, the fastest period of public sector employment growth was during 2009, immediately following the global financial crises, during which South Africa experienced significant job losses. This suggests that the state possibly acted as an unintended creator of jobs during a period of extreme labour market distress. Public sector employment growth was also high in 2012, after which employment has stabilized.

For the more than half a million jobs created in the public sector over the 2008-2014 period, Figure 10 plots the contribution of each occupation towards this change. Many of the occupations that are large contributors to public sector job growth fall under the category of elementary occupations (unskilled workers): sweepers and related labourers, farmhands and labourers, helpers and cleaners, construction and maintenance labourers, and garbage collectors. The other major contributors to public sector jobs creation are primarily within the service and related workers category; (medium-skilled workers):¹¹ police and traffic officers, institution- and home-based care workers, other protective services, prison guards, technikon teacher training, cooks, and child-care workers. The relatively faster growth in these two broad occupational categories is also reflected in Table 7. Apart from jobs in these two broad occupations, higher skilled jobs such as primary and secondary school teachers, finance and administrative managers, and legislators have also contributed to public sector job growth.

¹¹ This relates to skill level 5 out of 9 national skill level categories, where 9 is the least skilled category. See Notes to Table 5 for an explanation of how occupations map into skill levels.

Figure 10: Share of change in public sector jobs by detailed occupation (2008 Q1-2014 Q4)



Notes: These occupations are the largest 42 public sector occupations, making up 80 per cent of total employment in the public sector in 2014, and 97 per cent of the change in the number of public sector jobs over the 2008-14 period.

Source: StatsSA QLFS 2008Q1; StatsSA QLFS 2014Q4; own calculations.

From this brief analysis, it would seem that the Government's Expanded Public Works Programme (EPWP) is an important driver of public sector job creation. The EPWP was launched in 2004, and focuses on providing income relief through creating jobs for the unemployed and unskilled that involve socially useful activities. The EPWP creates jobs through government funded infrastructure projects, through its non-profit organization and community work programme, as well as through its public environment and culture programmes. As such, much of the public sector job growth shown in Figure 10 relates to the construction industry, the protection and safety sector, public sanitation, and personal care industries. Apart from EPWP, this data provides some evidence of the South African Government attempting to address the education crisis through increasing the number of primary and secondary school teachers within the public schooling system.

Table 7 clearly shows that there are significant differences between the average profile of employees in the public and private sectors, across all the demographic indicators and occupational categories, and for both time periods. The average age of public sector workers is 41 years old, compared to 38 in the private sector. Public sector workers have a significantly higher average educational level in both time periods, with this average rising faster in the public sector than the private. Females have greater representation in the public sector, making up 52 per cent of the respective workforce, compared to 44 per cent in the private sector. From

making up 72 per cent and 66 per cent of public and private sector employees in 2008 respectively, Africans now make up 77 per cent of public sector employment, with little change in this proportion in the private sector. There have been no changes in the proportion of Indian and Coloured workers in either sector, and White workers make up a smaller proportion of workers in both sectors now than they did in 2008. The public sector has clearly been able to transform its labour force at a faster pace than the private sector, given the higher proportion of both women and African workers in the sector—groups that have faced historical discrimination in the South African labour market.

Table 7: Mean characteristics of public and private sector workers (2008 and 2013)

	2008 Ratio of means (public / private)		2013 Ratio of means (public / private)		2008-13 Percent Δ Public	Percent Δ Private
Demographics:						
Age	1.10	*	1.07	*	0.51	2.63
Male	0.84	*	0.86	*	-2.04	-3.45
Race:						
African	1.09	*	1.15	*	6.94	1.52
Coloured	0.91		0.91	*	0	0
Indian/Asian	0.50	*	0.50	*	0	0
White	0.83	*	0.65	*	-26.67	-5.56
Years of Schooling	1.07	*	1.10	*	4.12	1.04
Married	1.15	*	1.09	*	-4.92	0
Union	2.27	*	3.18	*	2.34	-26.91
Occupation:						
1. Legislators, Senior Officials, and Managers	0.60	*	0.60	*	0	0
2. Professionals	1.83	*	1.57	*	0	25
3. Technical and Associate Professionals	4.13	*	3.00	*	-18.18	10.48
4. Clerks	1.25	*	1.25	*	0	0
5. Service, Shop, and Market Workers	1.18	*	1.31	*	30.77	18.18
7. Craft and Related Trades Workers	0.36	*	0.33	*	-20	-14.29
8. Plant and Machine Operators, and Assemblers	0.30	*	0.30	*	0	0
9. Elementary Occupation	0.76	*	0.94	*	23.08	0

Notes: 1. Public Sector includes all levels of Government and SOEs. Non-public sector excludes those working in agriculture or the informal sector.

2. Married includes individuals who are married or have partners that live together.

3. Union data is from the 2007 QLFS: 4.

4. * Indicates that the mean for the public and private sectors for each characteristic is significantly different at a 5% significance level.

Source: StatsSA QLFS (2008, Quarter 4); StatsSA LMDS (2013); own calculations.

In terms of the skills profile of each sector, the data shows that the public sector is more skills intensive. Almost 45 per cent of all public sector employees fall into the top three occupational categories, compared to 26 per cent of workers in the private sector. Both sectors, however, have a similar proportion of unskilled (elementary) workers, which indicates that private sector workers are concentrated in the medium-skilled occupations. Interestingly, the proportion of the

two most skills-intensive occupations have not changed in the public sector between 2008 and 2013, but the proportion of professionals in the private sector has increased by 25 per cent—consistent with the skills-biased labour demand shifts that were discussed earlier. As shown in Figure 10, growth in public sector jobs was driven by the medium-skilled occupation of service workers, as well as in elementary occupations, where these shares grew by 31 per cent and 23 per cent, respectively. Again, this may point to the state being able to absorb excess unskilled and medium-skilled labour at times of economic and labour market distress.

Therefore, public sector workers are more educated, older, more skilled, and mostly African in comparison with the formal private sector. Furthermore, the data shows that the public sector is more gender equitable than the private sector.

4.1 Bargaining power and the wage premium

Another feature of the public sector labour market is the relatively higher rates of unionization, which is often associated with a wage premium. Table 8 shows that the proportion of the public sector's formal workforce who are union members—or the public sector's union density—rose from 55 per cent in 1997 (834 thousand workers) to almost 70 per cent in 2013 (1.4 million workers). The private sector union density displays the opposite overall trend, declining from 36 per cent in 1997 to 24 per cent in 2013, while the absolute number of private sector unionized workers has remained fairly constant.

Table 8: Trade union membership of public and private sector employees in formal sector, selected years

Year	Private sector		Public sector	
	Number of union members	Union members as per cent of workers	Number of union members	Union members as per cent of workers
1997	1 813 217	35.6	835 795	55.2
2001	1 748 807	30.6	1 070 248	70.1
2005	1 925 248	30.1	1 087 772	68.4
2010	1 888 293	26.3	1 324 964	74.6
2013	1 868 711	24.4	1 393 189	69.2

Source: Bhorat et al. (2015a) using StatsSA OHS (1997); StatsSA LFS (2001, 2005); and StatsSA QLFS (2010, 2013).

Interestingly, as employment in the public sector has risen, so has membership of public sector trade unions to the extent that they now dominate union membership in South Africa. Not only then do we witness a rise in public sector employment, but also this data makes it clear that this employment rise has been commensurate with the rise of public sector trade unions in South Africa.

Powerful labour unions are often associated with creating a wage premium for their members, given their ability to mobilize industrial action and negotiate in favour of their members during times of wage negotiations. There is extensive literature on the union wage gap in South Africa, but slightly fewer studies on the bargaining council premium.¹² Taking account of this, Bhorat et al. (2012) use the 2005 South African Labour Force Survey data to investigate the union and bargaining council wage premiums and correct for the endogeneity of union status through a

¹² 'Bargaining councils can be established by one or more registered trade unions and by one or more registered employer organizations for a specific sector and area. Worker interests are therefore represented at bargaining councils by the relevant trade unions. Participation by unions and employer organizations in the system is voluntary, and the issues to be negotiated are left to the discretion of the parties. Wage formation within the bargaining council system is thus a voluntary exercise ongoing annually between employer organizations and employees (represented by trade unions). In many cases, these councils have a long history of regularized bargaining and engagement around worker issues.' (Bhorat et al. 2012: 402).

two-stage selection model, controlling for firm-level and job characteristics. In their most richly specified estimation,¹³ it is found that union members outside of the bargaining council system earned a premium of 7.04 per cent and those members of private and public bargaining councils not belonging to unions earned an 8.97 per cent and 10.5 per cent premium over non-union workers outside of the bargaining council system, respectively.¹⁴ The total estimated premium to union workers within the public bargaining council stands at 22 per cent.¹⁵ Therefore, there is evidence that belonging to either unions or bargaining councils is associated with statistically significant wage premia, and furthermore that unions may negotiate at the plant level for additional gains for their members within the bargaining council system.

When comparing wage levels between the public and private sectors, the data shows that both the median and mean wages of the public sector are significantly higher than that of the private sector (which is confirmed by simple t-tests). The real monthly wage of an average public sector employee is R11,668 (USD1,209¹⁶) compared to R7,822 (USD811) for an average private sector worker. Visually, this can be seen in Figure 11, where the distribution of public sector wages lie distinctly to the right of the corresponding private sector distribution. In addition, public sector wages have less dispersion than private sector wages, indicating a lower level of wage inequality within the public sector.

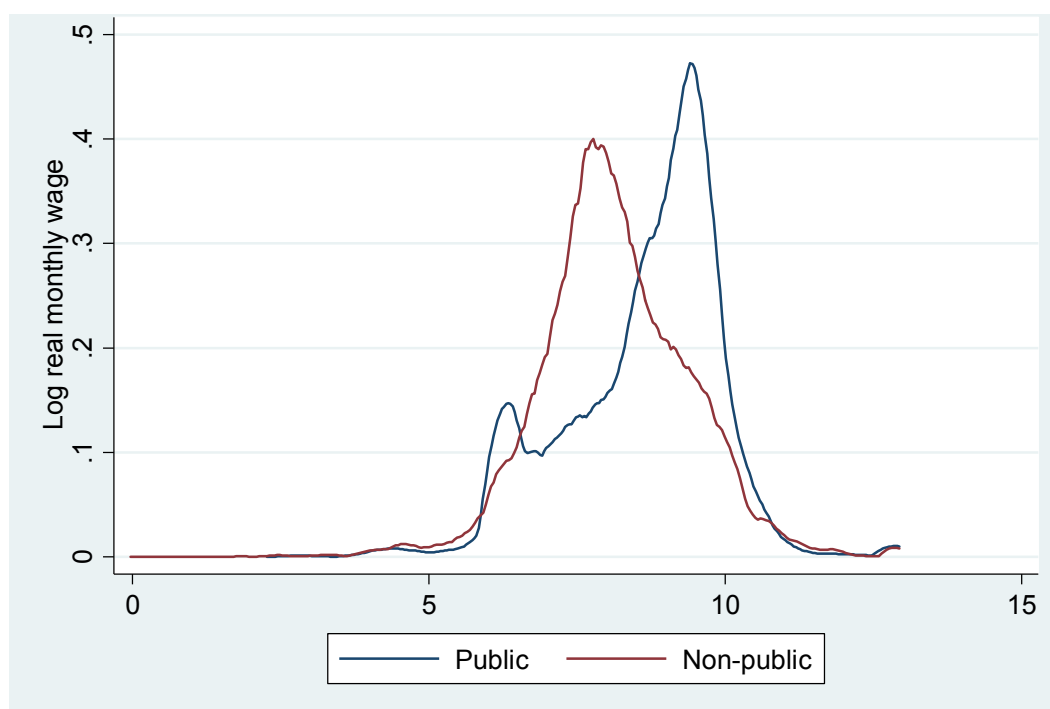
¹³ Including dummy variables for union status, private and public bargaining council status, type of work, firm characteristics, and non-wage benefits.

¹⁴ With significance at the 5 per cent level.

¹⁵ This research suggests that institutional wage premiums in South Africa may be smaller than previously estimated, with most of the previous studies reporting a premium in excess of 20 per cent—possibly overstated by not accounting for BC coverage (Butcher and Rouse 2001; Armstrong and Steenkamp 2008; Milica et al. 2013).

¹⁶ All Rand figures are converted to USD, using an average 2013 exchange rate of ZAR/USD: 9.65.

Figure 11: Wage distributions for public and private (non-public) formal sector employees (2013)



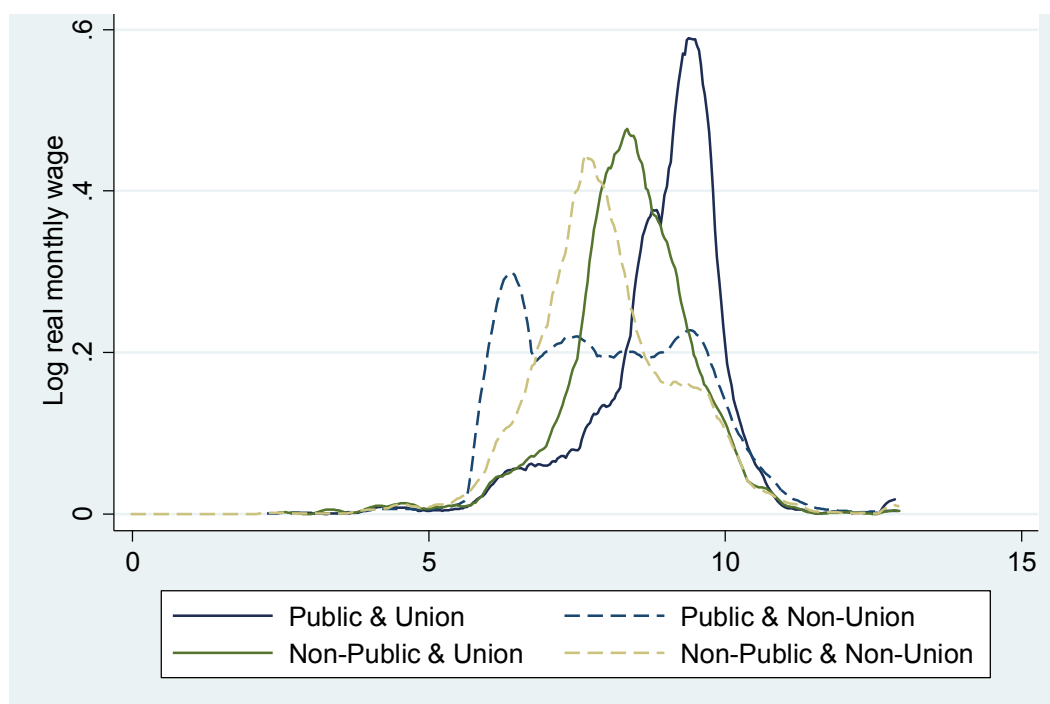
Notes: 1. Non-public sector in this excludes agriculture and the informal sector, thus defined as non-agricultural formal employment.

2. A two-sample Kolmogorov-Smirnov test of the equality of distributions confirms that these two distributions are significantly different from each other.

Source: StatsSA LMDS (2013); own graph.

Disaggregating the wage distributions by unionization reveals a slightly different picture (Figure 12). For non-unionized workers, the average real monthly wage in the private sector is statistically significantly larger than that of the public sector, by a margin of ZAR952 (USD99). While small, this suggests that the public sector premium is negative, or at the least disappears, for workers that do not belong to a union. Therefore, this provides some initial evidence that the public sector premium may be very closely tied to a public sector union membership premium.

Figure 12: Wage distributions for public and private (non-public) formal sector employees, by union status (2013)



Notes: 1. Non-public sector excludes agriculture and the informal sector.

2. A two-sample Kolmogorov-Smirnov test of the equality of distributions confirms that the distributions of unionized workers' wages by sector are significantly different from each other, as are the distributions of wages for non-unionized workers by each sector. Within the public sector, the wage distributions of unionized workers are significantly different from non-unionized workers, and similarly for the private sector.

Source: StatsSA LMDS (2013); own graph.

The 30 per cent of public sector workers that are not union members are, on average, distinctly different from those that are unionized, as shown in Table A6 (see Appendix). Unionized public sector workers are slightly older, more likely to be male, and have a higher average level of education than non-unionized public sector employees. African employees make up almost 80 per cent of non-union public sector employees, and Coloured workers a further 10 per cent. Most importantly though, non-unionized public sector workers are concentrated in elementary occupations (30 per cent), service and sales occupations (16 per cent), and technical and associate professional occupations (16 per cent). Whilst it remains uncertain, the non-unionized workers in the first two occupational groups are likely to be those employed under the EPWP.

Ultimately though, the wage distributions above suggest that, at least in terms of earnings, a dual labour market may indeed be prevalent in the South African labour market. Previous models of segmentation in the South African labour market have commonly referred to the distinction between the employed and the unemployed, or more recently, the formal and informal sector (Hofmeyr 1998; Bhorat and Leibbrandt 1999; Fields 2000; Devey et al. 2006; Valodia 2007) as the key identifying markers of this segmentation. We suggest a nuance to South Africa's segmented labour market here. In particular, and on the initial evidence of these bimodal wage distributions, it would appear that the distinction between public and private sector, in terms of earnings and employment, would seem to be a new form of segmentation, which has evolved in the South African labour market.

4.1.1 An econometric estimation

To investigate the public sector wage premium more rigorously, we estimate a two-stage Heckman employment model correcting for selection into the labour market. In this respect then, the standard earnings function of the following form is run:

$$y_i = \alpha + \beta_1 X_i + \delta PS_i + \mu U_i + \eta(PS_i \times U_i) + \gamma TES_i + \varepsilon_i \quad (5)$$

where y_i represents each individual's, i , log monthly real earnings, X_i is a vector of individual characteristics, PS_i indicates whether an individual is employed in the public sector or not, U_i indicates whether an individual is a union member or not, TES_i is a dummy variable for whether the individual is employed in the TES sector or not, and ε_i is a normally distributed error term. δ shows the wage premium for public sector workers that do not belong to a union, and coefficient μ provides the wage premium for union members that are not employed in the public or TES sectors. The sum of coefficients ($\delta + \eta$) yields the conditional estimate for the public sector premium of unionized workers. In our richest estimation, we split the public sector dummy variable into two separate dummies for Government employment and employment in SOEs:

$$y_i = \alpha + \beta_1 X_i + \delta Gov_i + \tau SOE_i + \mu U_i + z(Gov_i \times U_i) + \gamma(SOE_i \times U_i) + \gamma TES_i + \varepsilon_i \quad (6)$$

The results of the OLS earnings function are shown in Table 9. In specifications 1 and 3, we model the public sector as a whole, while in 2 and 4, we disaggregate it into Government employment and employment in SOEs. Specification 3 is differentiated from specification 1 by interacting the public sector dummy with the union dummy, and similarly for specification 4, Government and SOE are interacted with the union dummy.

In the first two specifications, which merely control for union membership, we find no significant wage premium for workers in the public sector. The union membership premium, however, is large and significant at 37 per cent.¹⁷ Given our earlier analysis, however, it seems likely that the interaction between union membership and public sector employment would reveal a more interesting picture. The results of the interacted specifications show that for non-unionized members, there is a wage penalty for working in the public sector, relative to the private sector, of 18.5 per cent. In addition, there is also a wage penalty associated with TES employment, for non-unionized workers. For unionized workers, however, the public sector wage premium is 20.7 per cent.¹⁸ In particular, for Government workers, the wage premium within the group of workers belonging to a union is 23.5 per cent, whereas there is no significant wage premium for employees of SOEs.

Therefore, these initial results show that, when also controlling for TES employment, there is no public sector wage premium. However, as a member of a union, the premium is significant and large. This result is certainly novel. Earlier estimates of the public sector wage premium are provided by Woolard (2002), who finds a premium of 18 per cent for public sector workers. Her results also show that the premium is higher for women (21 per cent) than for men, and particularly for African women—who were associated with a 36 per cent premium. While these results control for union membership, there is no interaction of union membership with public sector employment.

¹⁷ Calculated as $\exp(0.317) - 1$.

¹⁸ Calculated as $\exp(-0.205 + 0.393) - 1$. The remaining wage premiums are calculated similarly.

Given the rising membership of public sector unions shown above, together with the growing political influence of these unions, these results possibly allude to the role played by unions in driving higher returns for their members in the post-2000 period. This pattern of wage returns potentially suggests segmentation between unionized public sector workers versus all other formal, non-agricultural workers.

Table 9: Estimated earnings function, corrected for selection bias (2013)

Log of real monthly wages	(1)	(2)	(3)	(4)
Government level				
Public sector	0.0109 (0.0162)		-0.205*** (0.0223)	
Government		0.0194 (0.0165)		-0.233*** (0.0230)
SOE		-0.0392 (0.0393)		-0.0287 (0.0619)
Interaction with union				
Public*Union			0.393*** (0.0285)	
Government*Union				0.444*** (0.0294)
SOE*Union				0.0558 (0.0785)
Union	0.318*** (0.0139)	0.317*** (0.0139)	0.207*** (0.0162)	0.207*** (0.0162)
TES	-0.108*** (0.0209)	-0.108*** (0.0209)	-0.111*** (0.0209)	-0.110*** (0.0209)
Lambda	-0.180*** (0.0353)	-0.179*** (0.0354)	-0.165*** (0.0352)	-0.162*** (0.0352)
Observations	52,475	52,475	52,475	52,475
R-squared	0.402	0.402	0.406	0.406

Notes: 1. Dependent variable is log of real monthly wages.

2. We exclude the agricultural sector and informal workers. Therefore, we only considered those employed in the formal non-agricultural sectors, who are within the 15-65 age category.

3. We include the following controls: gender, age, race, education splines, province dummies, whether the person lives in an urban or rural location, occupation dummies, and firm size.

4. The Public Sector is made up of both Government and SOEs, which are interrogated separately in specifications 2 and 4.

5. Government is comprised of national, provincial, and local government.

6. Robust standard errors in parentheses.

7. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: StatsSA LMDS (2013); own calculations.

A more nuanced analysis of the public sector wage premium can be performed using quantile regressions, presented in Table 10.¹⁹ This analysis is conducted to investigate whether the results shown in Table 9 are purely mean effects (for example, driven only by a few specific occupations that then influences the mean wage premium), or whether the premium exists across the income distribution. Recall that quantile regressions refer to the generalized case of the least absolute deviations estimator. While through ordinary least squared estimation, as per the above estimations, we derive a sample mean by minimizing the sum of squared residuals, the sample median can be derived through minimizing the sum of absolute residuals (Koenker and Bassett

¹⁹ For the simpler specification without interaction terms, see Table A6 (Appendix).

1978; Koenker and Hallock 2001). If we take a general statement of this approach across all points, or quantiles, in the distribution, we have the estimation for the regression quantile as minimizing the equation:

$$\text{Min}_{\beta \in \mathfrak{R}^k} \left[\sum_{i \in \{i: Y_i \geq X_i \beta\}} \theta |Y_i - X_i \beta| + \sum_{i \in \{i: Y_i < X_i \beta\}} (1 - \theta) |Y_i - X_i \beta| \right] \quad (7)$$

This then provides the solution for the θ^{th} quantile, where $0 < \theta < 1$, allowing for estimation at any given point in the distribution of the outcome variable. In the above, Y_i is the dependent variable, \mathbf{x}_i is the $k \times 1$ vector of independent variables, and β is coefficient vector (Koenker and Bassett 1978).

We estimate the returns to Government and SOE employment using interacted variables, presented in Table 10. The coefficients of interest are plotted in Figure 8. The results show that for South African workers that do not belong to a union, there are significant wage penalties associated with Government employment, across the wage distribution. This penalty is highest at the 25th percentile and decreases toward the highest wage levels. The wage returns for non-unionized workers to SOE employment has a different pattern. There are small wage penalties below the median wage; however, this becomes positive and high at the 75th percentile.

Table 10: Estimated quantile earnings function with interactions, corrected for selection bias (2013)

Log of real monthly wages	(1) 10 th	(2) 25 th	(3) 50 th	(4) 75 th	(5) 90 th
Government (non-union)	-0.239*** (0.0292)	-0.447*** (0.0146)	-0.316*** (0.0272)	-0.0966*** (0.0331)	-0.0237 (0.0240)
SOE (non-union)	-0.0792 (0.122)	-0.0783** (0.0324)	-0.0336 (0.0593)	0.128*** (0.0352)	0.0307 (0.0218)
Union (non-public sector)	0.225*** (0.0289)	0.227*** (0.0188)	0.229*** (0.0128)	0.221*** (0.0142)	0.186*** (0.0206)
Government*Union	0.334*** (0.0562)	0.680*** (0.0316)	0.636*** (0.0319)	0.374*** (0.0361)	0.164*** (0.0293)
SOE*Union	-0.111 (0.153)	0.0699 (0.104)	0.103 (0.0791)	0.104* (0.0537)	0.137** (0.0542)
TES	0.126*** (0.0331)	0.00510 (0.0183)	-0.126*** (0.0148)	-0.224*** (0.0178)	-0.284*** (0.0322)
Lambda	0.00453 (0.0544)	-0.105*** (0.0371)	-0.218*** (0.0300)	-0.238*** (0.0346)	-0.280*** (0.0407)
Observations	52,475	52,475	52,475	52,475	52,475

Note: 1. The dependent variable is log of real monthly wages.

2. We exclude the agricultural sector and informal workers. Therefore, we only considered those employed in the formal non-agricultural sectors, who are within the 15-65 age category.

3. We include the following controls: gender, age, race, education splines, province dummies, whether the person lives in an urban or rural location, occupation dummies, and firm size.

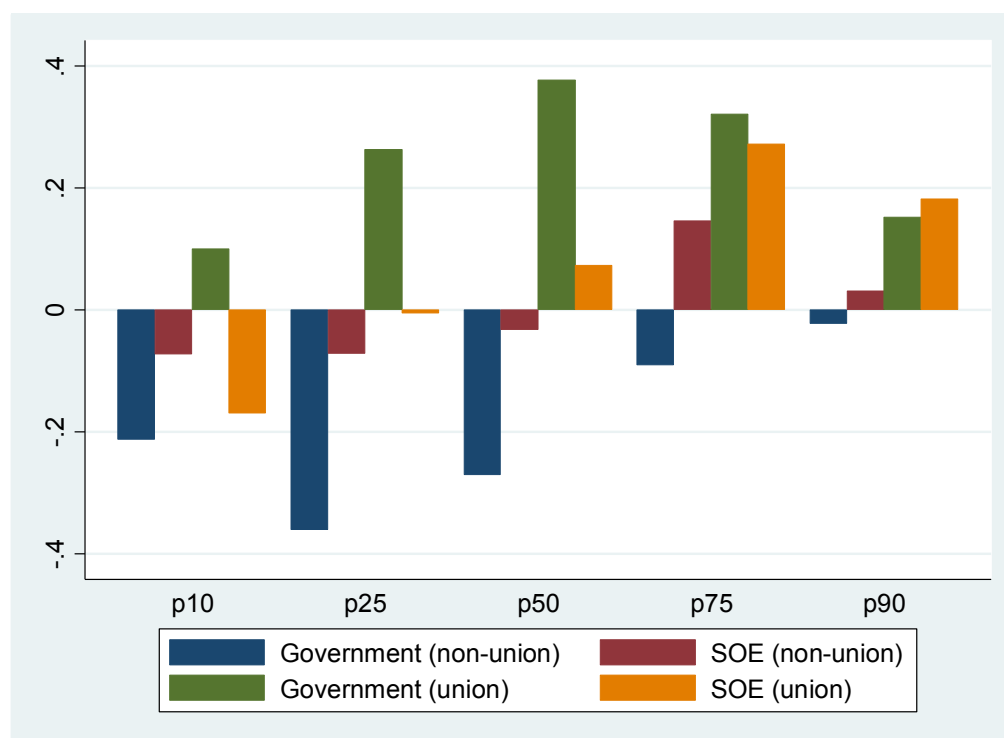
4. Robust standard errors in parentheses

5. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: StatsSA LMDS (2013); own calculations.

For unionized workers in the labour market there are high and positive returns to Government employment relative to those unionized workers in the non-TES private sector. The median wage premium is 37 per cent, which declines to 15 per cent at the 90th percentile. Unionized employees at SOEs only experience positive wage premia in the top quartile of the distribution, relative to non-TES private sector unionized workers in this same quartile.

Figure 13: Estimated public sector wage across the wage distribution (2013)



Source: StatsSA LMDS (2013); own calculations.

In summary, our results do not show any significant average public sector premium using the latest data available. Instead, we find average wage penalties to government employment at lower wage levels, and positive wage premia at higher levels, whilst controlling for union membership that is associated with positive wage premia across the distribution. When isolating unionized workers, we find that there are significantly large wage premia associated with government employment relative to unionized workers in non-TES private sectors.

Therefore, we find that a key new facet of the South African labour market is an estimated wage wedge between unionized public sector workers and other formal non-agricultural workers in the labour market. In one conception, we could argue that the post-2000 period has generated new labour elite in the labour market, namely the unionized public sector employee.

4.2 Revisiting South Africa's labour market segmentation: A brief test

Whilst Table 7 provides an interesting descriptive overview of the mean characteristics of public and private sector workers, this section delves deeper into estimating the conditional probabilities of an individual being employed in the public sector or being unemployed, relative to the private sector.

A two-stage model is applied here in order to determine the factors that influence labour-force participation. We first estimated individual participation in the labour force and then calculated individuals' probability of choosing an employment sector. We assume that the distribution of

workers in these labour market segments is not random. Individuals therefore face three mutually exclusive choices: unemployment ($j=0$), public sector employment ($j=1$), and employment in the non-agricultural private sector ($j=2$). The referent segment is the non-agricultural formal private sector. Employment-sector choice is modelled as being a factor of individual characteristics, human capital, and locational factors.

The multinomial logit estimates for selection into various forms of labour market activity are shown in Table 11. The table shows the marginal effects of each variable on the probability of participating in a particular segment of the labour market and the significant coefficients are discussed here. The base outcome is employment in the non-agricultural private sector and therefore does not have estimates.

Table 11: Multinomial logit model of labour force choice

	Unemployed	Public Sector
Male	-0.0553*** (0.00591)	-0.00472 (0.00382)
Age 25 to 34	-0.238*** (0.0220)	0.125*** (0.0151)
Age 35 to 44	-0.351*** (0.0231)	0.195*** (0.0158)
Age 45 to 54	-0.408*** (0.0208)	0.228*** (0.0143)
Age 55 to 65	-0.455*** (0.0103)	0.227*** (0.00790)
African	0.266*** (0.0103)	0.0674*** (0.00520)
Coloured	0.204*** (0.0110)	0.0738*** (0.00568)
Asian	0.137*** (0.0162)	-0.0104 (0.00903)
Education level 2	0.0153 (0.0169)	0.0313** (0.0136)
Education level 3	0.0251** (0.0123)	0.00571 (0.00935)
Education level 4	-0.0426*** (0.0155)	0.0901*** (0.0114)
Education level 5	-0.135*** (0.0216)	0.170*** (0.0153)
Education level 6	-0.142*** (0.0281)	0.239*** (0.0174)
Education level 7	-0.268*** (0.0221)	0.288*** (0.0154)
Education level 8	-0.364*** (0.0252)	0.336*** (0.0158)
Urban	-0.178*** (0.00593)	-0.00270 (0.00407)
Observations	108,704	108,704

Notes: 1. For the second stage, we only consider non-agricultural formal sector workers, within the 15-65 age category.

2. We included provincial dummies, which are not represented here. We have also not presented the lambda coefficient from the first-stage of the regression model.

Source: StatsSA LMDS (2013); own calculations.

The results indicate that individuals across all the age categories (25-65) are more likely to be employed in the public sector rather than the formal private sector, but particularly workers over the age of 45. The smaller coefficients (in absolute magnitude) on the younger age categories for the unemployed show that these individuals are more likely to be unemployed than older

workers are. Of course, all age categories are less likely to be unemployed than employed in the private sector.

African and Coloured individuals are more likely to be employed in the public sector than the private sector. Interestingly, these results also confirm the skills-biased nature of public sector employment given that the educational splines are powerful predictors of public sector employment. Those with the highest levels of education attainment are relatively even more likely to be employed in the public sector than the private sector.

This cursory look at a labour market segmentation model begins to formalize our earlier findings of a distinctly different public sector labour market wherein middle aged African and Coloured workers with at least a complete secondary education, are choosing to enter the public sector explicitly, over and above the private sector, in search of long-term employment.

5 Conclusion

South Africa's economic growth over the past two decades has been driven primarily by the services sector; namely the financial and business services sector, construction, and to some extent wholesale and retail trade. Employment growth has been driven by services sectors, and in particular, higher-skilled occupations. This is against a backdrop of stark human capital deficits that are a result of elevated rates of high-school dropouts and low levels of learning for those that do complete high school. In combination, these two factors are arguably central to the persistently high levels of unemployment and inequality.

The growth of the TES sector was shown to be a relatively new labour market trend. Part of the growth in services employment has been the rise in labour brokers that source workers for the TES sector. On the surface, it seems to be related to South Africa's stringent labour market regulations, however, this needs deeper investigation.

This paper has also shown that an important trend in the South African labour market has been the rising share of workers in the public sector, and in Government in particular. Job creation in Government over the last six years is concentrated in unskilled and medium-skilled occupations, and the data suggests that it may be linked to a Government-lead programme to create jobs for the unemployed and the unskilled in activities relating to infrastructure building, public safety, and other community-based public service jobs.

Overall though, we see higher average wages in the public sector relative to the private sector. Estimations of the wage premia for public sector workers show that much of the difference in public-private wages has to do with union membership. For unionized workers in the South African labour market, employment in Government is associated with significantly higher returns than private sector employment. We show then a key new form of segmentation in the South African labour market, namely between the higher earning unionized public sector worker and the rest of the labour market.

Ordinarily such segmentation would be of general curiosity and academic interest. However, coupled with a sclerotic economy that is unable to generate large numbers of jobs in the private sector (most notably in manufacturing), or where its firms are actively engaged in avoiding direct employment, this result is particularly worrying. A long-run employment trajectory built on the public sector requires critical reassessment as part of a broader revitalising of the economy's growth and development strategy.

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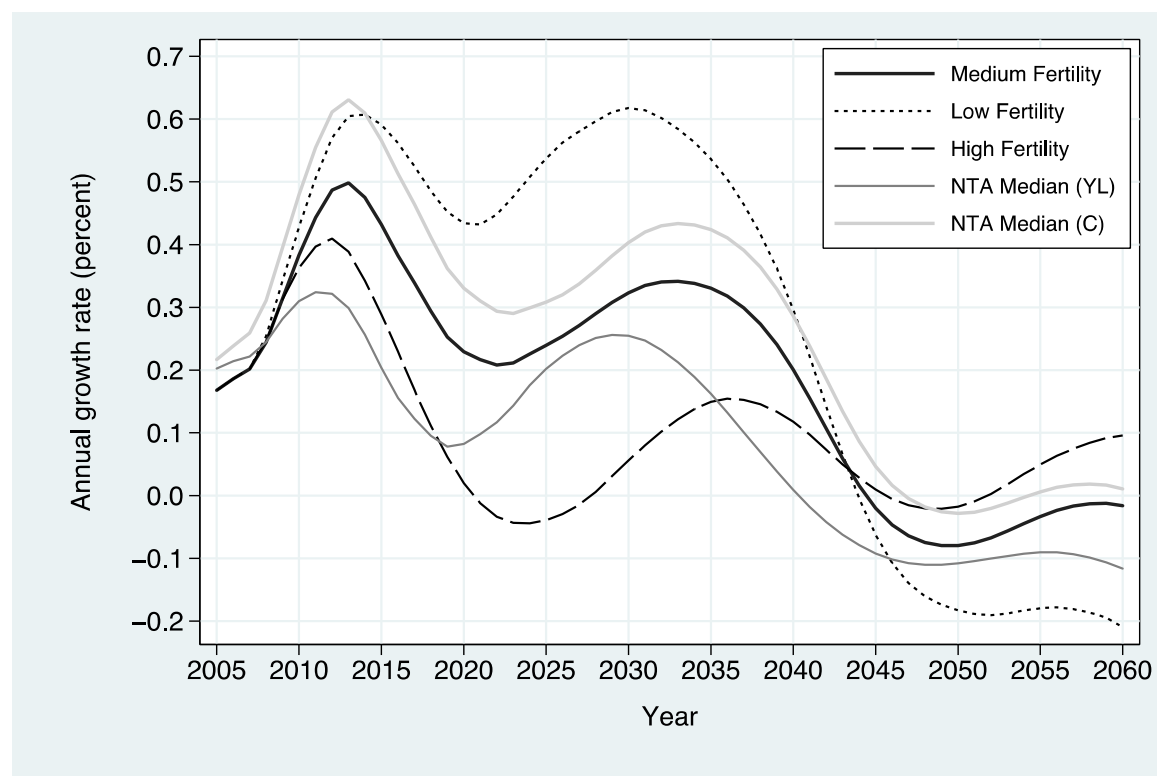
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Appendix

Figure A1: Estimates of the first demographic dividend for South Africa (2005-60)



Notes: 1. Demographic dividend estimates have been smoothed by calculating the annual average growth rate of the support ratio over a six-year period (e.g. 2005-10), allocating that value to the middle period (e.g. year 2007), and interpolating annual values using a quadratic polynomial.

2. Median age profiles for labour income and consumption are constructed using the median normalized value across the 34 countries for which data is available within each age cohort. Where countries have estimates for multiple years, only the most recent estimate is used.

3. The medium variant is the baseline projection. The low and high fertility variants differ from the medium variant by 0.5 children per woman.

Source: Oosthuizen (2014) using National Transfer Accounts (2013) data.

Table A1: Employment shifts by industry (per cent share in total employment), (1994, 2004, 2013)

Industry	1994 Share (%)	2004 Share (%)	2013 Share (%)	'94-'04 % change	'04-'13 % change
Agriculture; hunting; forestry and fish	14.99	9.23	4.98	-38.40	-46.06
Mining and quarrying	2.91	3.57	2.74	22.41	-23.18
Manufacturing	16.65	14.63	12.22	-12.13	-16.48
Electricity; gas and water supply	0.95	0.87	0.87	-9.09	0.30
Construction	4.63	7.11	7.69	53.65	8.17
Wholesale and retail trade	17.58	21.65	21.11	23.13	-2.50
Transport; storage and communication	5.25	4.86	6.15	-7.56	26.66
Financial intermediation; insurance; related services	5.65	9.87	13.45	74.66	36.22
Community; social and personal services	31.11	18.83	22.48	-39.46	19.38
Domestic work	0.27	9.38	8.29	3416.06	-11.61

Source: PALMS dataset 1994-2012 (DataFirst 2014); StatsSA Labour Market Dynamics Survey (2013); own calculations.

Table A2: Change in employment: Business activities not elsewhere classified ('other')

	1999		2014		1999-2014
	Number	Share	Number	Share	Average Annual Growth (per cent)
Business Activities NEC/Other	312 401	1	970 783	1	7.9
Selected Occupations					
Protective Services Workers NEC	147 165	0.47	419 176	0.43	7.2
Helpers, cleaners in offices, hotels	40 715	0.13	143 771	0.15	8.8
Farmhands and Labourers	131	0.0004	55 710	0.06	49.7

Source: StatsSA OHS 1999; StatsSA QLFS Quarter 1, 2014.

Table A3: Employment shifts by occupation (per cent share in total employment), (1994, 2004, 2013)

Occupation	1994	2004	2013	94-'04	04-'13
	Share (%)	Share (%)	Share (%)	% change	% change
High-skilled					
Legislators	5.61	7.85	8.31	40.06	5.84
Professional	6.22	3.96	6.3	-36.25	59.01
Technician	8.18	9.77	11.07	19.53	13.29
Medium-skilled					
Clerk	11.57	9.89	10.76	-14.47	8.76
Sales and services	10.63	12.39	14.51	16.51	17.12
Skilled agriculture	1.39	2.91	0.48	109.07	-83.50
Craft and related trade	12.03	13.27	11.64	10.28	-12.29
Plant and machine operator	11.94	9.67	8.57	-19.06	-11.34
Unskilled					
Elementary	28.69	22.61	21.65	-21.18	-4.26
Domestic Worker	3.75	7.67	6.72	104.76	-12.42

Source: PALMS dataset 1994-2012 (DataFirst 2014); StatsSA Labour Market Dynamics Survey (2013); own calculations.

Table A4: TES and formal sector employment: Comparison of occupational distributions

	Other Formal Employment		TES (Formal Employment)		Ratio of Share (%): TES/Other
	Number	Share (%)	Number	Share (%)	
Managers	792 534	8.0	35 005	4.1	0.51
Professionals	2 127 612	21.5	75 780	8.9	0.41
Clerical Workers	1 399 841	14.2	87 847	10.4	0.73
Service and Sales Workers	1 263 910	12.8	390 433	46.1	3.60
Agr. and Fishing Workers	26 500	0.3	404	0.0	0.00
Craft & Trade Workers	1 160 077	11.7	15 277	1.8	0.15
Operators and Assemblers	1 042 171	10.5	24 339	2.9	0.28
Elementary Workers	2 076 654	21.0	218 209	25.8	1.23
Total	9 889 299	100.0	847 294	100	1.00

Notes: The ratio is based on the share of formal non-TES employment to TES employment.

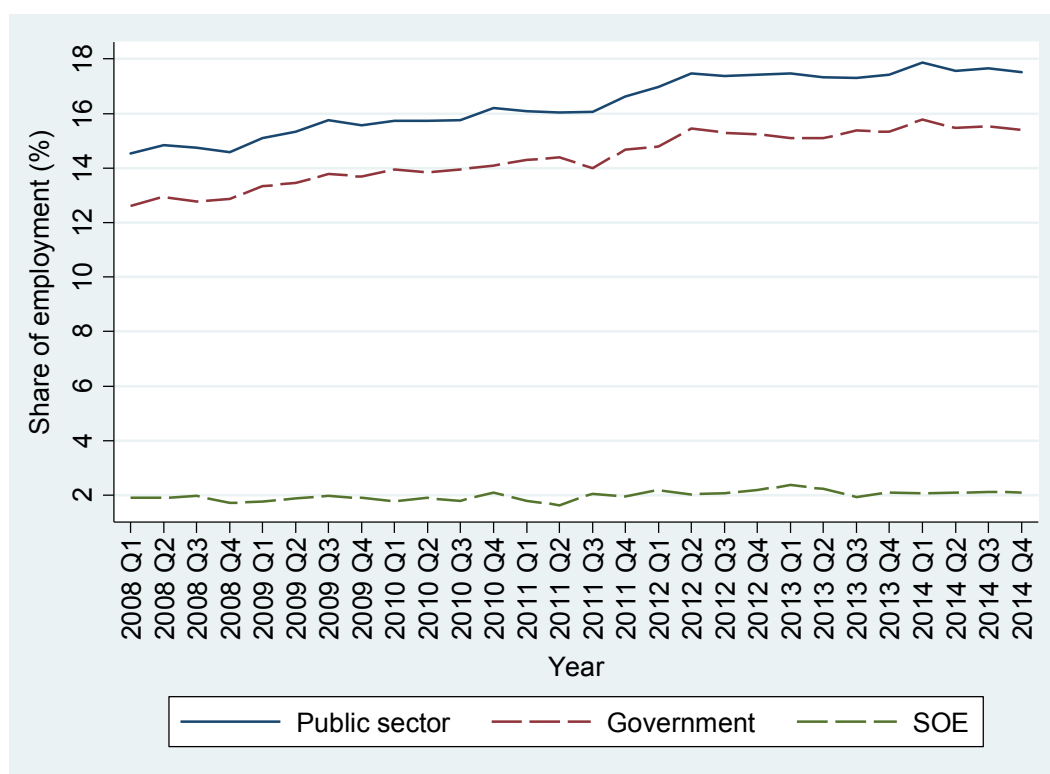
Source: StatsSA QLFS 2014 Quarter 1, 2014; own calculations.

Table A5: Employment in the public sector (2008-14)

Year	Government	SOEs	Total	Year-on-year total change (%)	Share in employment index
2008 Q1	1 823 615	276 359	2 099 974		1.00
2008 Q2	1 891 215	278 186	2 169 401		1.02
2008 Q3	1 859 838	287 284	2 147 122		1.01
2008 Q4	1 903 027	254 920	2 157 947		1.00
2009 Q1	1 952 115	257 396	2 209 511	3.92	1.04
2009 Q2	1 933 604	272 086	2 205 690	3.30	1.06
2009 Q3	1 908 643	272 581	2 181 224	6.92	1.08
2009 Q4	1 912 965	265 561	2 178 526	6.79	1.07
2010 Q1	1 927 725	246 584	2 174 309	4.17	1.08
2010 Q2	1 914 138	263 095	2 177 233	2.61	1.08
2010 Q3	1 906 977	246 122	2 153 099	-0.06	1.08
2010 Q4	1 960 613	292 007	2 252 620	3.92	1.11
2011 Q1	1 988 218	250 908	2 239 126	2.29	1.11
2011 Q2	2 005 930	228 991	2 234 921	1.91	1.10
2011 Q3	1 978 922	289 856	2 268 778	1.90	1.10
2011 Q4	2 104 959	281 393	2 386 352	2.72	1.14
2012 Q1	2 114 609	312 482	2 427 091	5.53	1.17
2012 Q2	2 216 382	291 937	2 508 319	8.98	1.20
2012 Q3	2 231 742	303 895	2 535 637	8.29	1.20
2012 Q4	2 215 565	318 064	2 533 629	4.81	1.20
2013 Q1	2 200 220	345 103	2 545 323	2.89	1.20
2013 Q2	2 218 622	327 893	2 546 515	-0.92	1.19
2013 Q3	2 314 675	291 584	2 606 259	-0.40	1.19
2013 Q4	2 328 769	319 749	2 648 518	0.00	1.20
2014 Q1	2 378 532	313 886	2 692 418	2.23	1.23
2014 Q2	2 337 177	316 198	2 653 375	1.39	1.21
2014 Q3	2 354 133	321 700	2 675 833	2.02	1.22
2014 Q4	2 365 131	322 960	2 688 091	0.46	1.21

Source: StatsSA QLFS (2008-14); own calculations.

Figure A2: Share of public sector employment in total employment



Source: StatsSA QLFS (2008-14); own calculations.

Table A6: Mean characteristics of public sector employees by union status (2013)

	Non-union		Union		
	Mean	Std. Error	Mean	Std. Error	
Age	39.03	0.20	41.95	0.11	***
Male	42.49	0.01	49.60	0.01	***
Race:					
African	73.67	0.01	77.75	0.00	***
Coloured	8.96	0.00	10.50	0.00	***
Indian/Asian	2.75	0.00	2.34	0.00	
White	14.62	0.01	9.42	0.00	***
Occupation:					
1. Legislators, Senior Officials and Managers	7.34	0.01	5.14	0.00	***
2. Professionals	12.82	0.01	10.82	0.00	**
3. Technical and Associate Professionals	16.24	0.01	32.35	0.01	***
4. Clerks	12.37	0.01	16.65	0.00	***
5. Service, Shop, and Market Workers	16.24	0.01	17.38	0.00	
7. Craft and Related Trades Workers	2.91	0.00	3.88	0.00	**
8. Plant and Machine Operators, and Assemblers	2.15	0.00	3.85	0.00	***
9. Elementary Occupation	29.82	0.01	9.88	0.00	***
Years of Schooling	12.02	0.06	13.26	0.03	***
Married	49.14	0.01	62.12	0.01	***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: StatsSA LMDS (2013); own calculations.