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New data, new approaches and new evidence: A policy synthesis

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WIDER Working Paper 2017/202

New data, new approaches and new evidence

A policy synthesis

Channing Arndt*

December 2017

Abstract: The Republic of South Africa faces the imperative of escaping economic stagnation. This paper seeks to synthesize results from a series of research efforts, including but not limited to the work conducted under the UNU-WIDER project on ‘Regional growth and development in Southern Africa’, and consider policy options for escaping economic stagnation. The focus is on South Africa and South African policies yielding relatively quick dividends in terms of growth and taking the rest of the world as given. Four broad implications are presented. These could form part of a concerted effort to escape from South Africa’s long running economic malaise.

Keywords: South Africa, growth, productivity, wage premium, trade

JEL classification: O11, D24, F16, F22

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1 Introduction

The Republic of South Africa faces the imperative of escaping economic stagnation. The broad level economic ills besetting South Africa are well known but bear brief repetition: real GDP per capita has hardly grown for nine years; productivity growth has been slow and appears to be slowing; the unemployment rate has recently been increasing from already extraordinarily high levels; and inequality remains stubbornly very high.

This paper draws from a series of efforts designed principally to provide insights into the nature of the ills besetting the South African economy and consider policy options for escaping economic stagnation. It is a synthesis drawing upon work conducted under the Regional growth and development in Southern Africa project of UNU-WIDER as well as other research. The focus is on South Africa and South African policies largely taking the rest of the world as given.¹ The paper is structured as follows. Section 2 briefly presents the new data and approaches that have helped to bring new information to bear. Section 3 describes salient results and seeks to link disparate research findings into a more coherent narrative. Finally, section 4 sets forth four broad implications of the narrative developed in section 3.

2 New data and new approaches

Over the past five years, considerable efforts have been made to make available new data, which in turn permit new approaches. Three data efforts are in focus here. First, the Economic Policy Division within the National Treasury (NT-EP) has collaborated with UNU-WIDER to produce a new baseline social accounting matrix (SAM) for the year 2012 (van Seventer et al. 2016) and a time series of real and nominal SAMs from 1993-2013 (van Seventer 2015b). This time series is new in the South African context (and rare internationally). These data permit detailed study of structural change in South Africa and rigorous evaluation of productivity growth rates by sector.

Second, the South African Revenue Service (SARS) has collaborated with NT-EP to employ administrative record data from SARS for economic policy analysis. The data sets employed include personal income tax, corporate income tax, and value added tax, which links to the international trade accounts permitting examination of trade issues. The data refer to the population of employees and firms operating within the formal sector. These data permit analyses at the level of the firm, rather than sector, and highlight the high degree of heterogeneity across firms. For a host of reasons, exploitation of tax administrative record data has become global best practice, and South Africa is, to my knowledge, the first country on the African continent to mount a serious effort to employ these data for the purposes of policy analysis.

Finally, within the context of the Research Project on Employment, Income Distribution and Inclusive Growth (REDI), a series of data initiatives have been undertaken. Among these is the Post-Apartheid Labour Market Series (PALMS) data set which has been employed by Wittenberg (2014) and Branson and Leibbrandt (2013) to examine trends in wage inequality.²

¹ An assessment of the Southern Africa region, and the fundamentally collaborative policies that are required to realize the full scope of regional development potentials, can be found in Arndt and Roberts (2017).

² The PALMS data are available here: <https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/434>.

3 New evidence

3.1 Growth and productivity by sector

We begin with sectoral growth and productivity measures. In the aggregate, productivity grew by approximately 1.4 per cent per annum over the period 1993 to 2013. However, nearly all of that growth occurred prior to 2008. Between 2008 and 2013, aggregate productivity growth declined to nearly zero. These aggregates also disguise significant variation by sector.

Figure 1 summarizes this sector level information. In the figure, the vertical axis represents productivity growth and the horizontal axis represents employment growth. The size of the bubble is proportional to the sector's share in GDP at factor cost. A series of key observations emerge. First, there are no sectors exhibiting both high productivity and high employment growth. The sector with the most rapid employment growth, finance (Fin),³ exhibits a low rate of productivity growth while the sector with the most rapid productivity growth, transport equipment (Tequip), exhibits negative employment growth. This contrasts with rapidly growing Asian economies where a flow of resources towards high productivity growth sectors leverages aggregate productivity growth as high productivity sectors become larger and hence take on more weight in the economy.

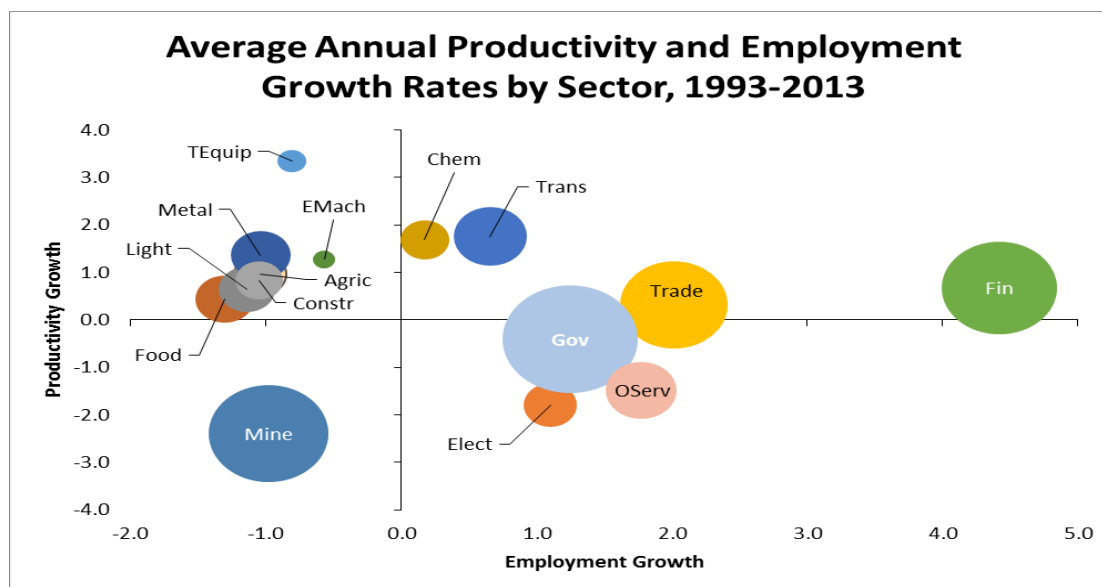
Second, a large sector, mining (Mine), and an important sector, electricity (Elect), exhibit substantial rates of negative productivity growth. Mining also exhibits negative employment growth. The most plausible explanation for measured negative productivity growth in the mining sector is the exhaustion of easily extractable resources. Mining firms must dig deeper and look harder to extract the same volume of product. Also for this reason, employment in mining has been declining with negative implications for overall employment due to the initial large size of the sector.

Productivity growth in the electricity sector has also been strongly negative driven by a dramatic drop in productivity in the 2008 to 2013 period.⁴ While the electricity sector is not a particularly large sector viewed in isolation, broad economic knock-on effects follow a failure to generate sufficient power. Constrained electricity supply is a second highly likely culprit explaining the general productivity and growth slowdown across all sectors, particularly during the period from 2008 to 2013.

³ Security services are aggregated with the financial sector. These security services provide the major impetus to employment growth.

⁴ The decline is partly due to major investments in generation capacity that had not yet come on line.

Figure 1: Average annual productivity and employment growth rates by sector (1993-2013)



Source: Arndt et al. (2016)

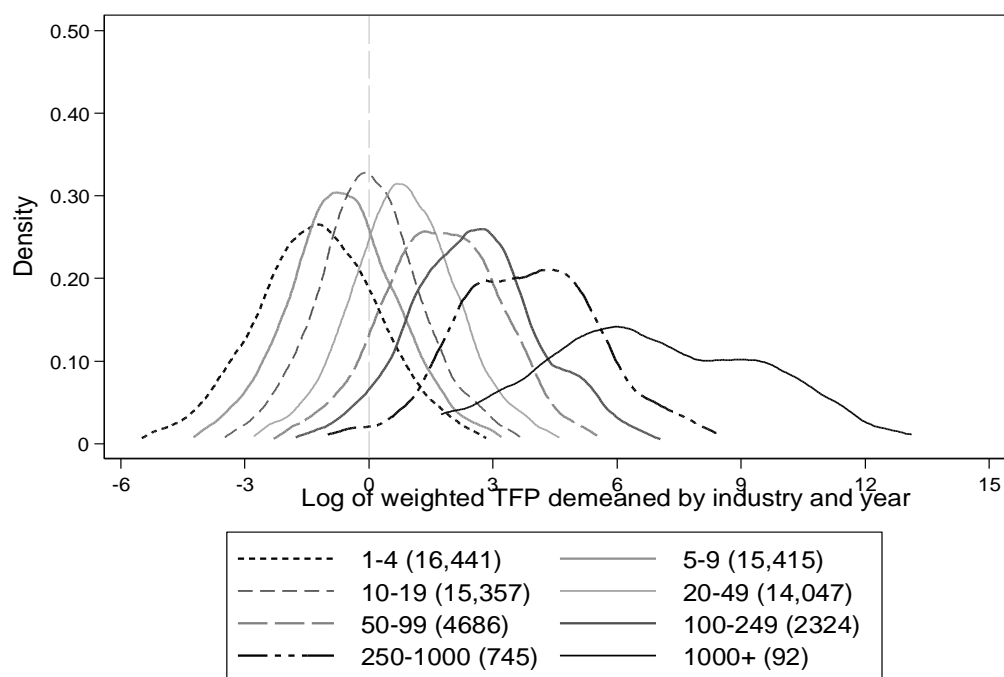
Finally, manufacturing sectors tend to exhibit positive productivity growth but negative employment growth while services sectors tend to show positive employment growth but low rates of productivity growth. Hence, even though manufacturing sectors have received substantial policy attention, there is no sector that has effectively linked to a flat global demand curve that permits it to enter a virtuous cycle of rapid productivity growth, enhanced competitiveness, expanded export volumes (and thus increasing employment) and increased profits allowing for reinvestment in capital and knowhow, which in turn boosts productivity. The characteristics of manufacturers are in focus in section 3.2. The following section, 3.3, considers services with an emphasis on services exports.

3.2 Characteristics of manufacturers

The SARS administrative records data allows for examination of sectors in unprecedented detail by allowing analysis to proceed at the level of each individual firm. Three principal results are in focus. First, manufacturing firms are notably heterogeneous in terms of their productivity levels. Second, firm level productivity varies strongly by firm size, with larger firms being more productive. Third, linkages to international markets are strongly associated with higher levels of productivity. This is true whether the firm exports its final products or imports intermediate goods. Those firms that both rely on imported intermediates and export their final goods are among the most productive manufacturing firms in South Africa. Export destination also matters with high productivity firms capable of entering markets in high income countries and exporting multiple products to multiple destinations. All of these observations are very consistent with international evidence (Edwards et al. 2016; Kreuser and Newman 2016; Matthee et al. 2016).

The first two observations are illustrated in Figure 2. The horizontal axis shows relative productivity levels (an average from 2010–13) across firms with greater values corresponding to higher productivity levels. The vertical axis is a measure of density. For a given productivity level, a greater density implies that more firms concentrate near that productivity level. Density functions are shown by employment levels within manufacturing firms. The smallest firms have one to four employees while the largest firms have more than 1,000 employees. The figure illustrates that differences in productivity levels across firms are enormous. In addition, productivity levels tend (very strongly) to increase with firm size (Kreuser and Newman 2016).

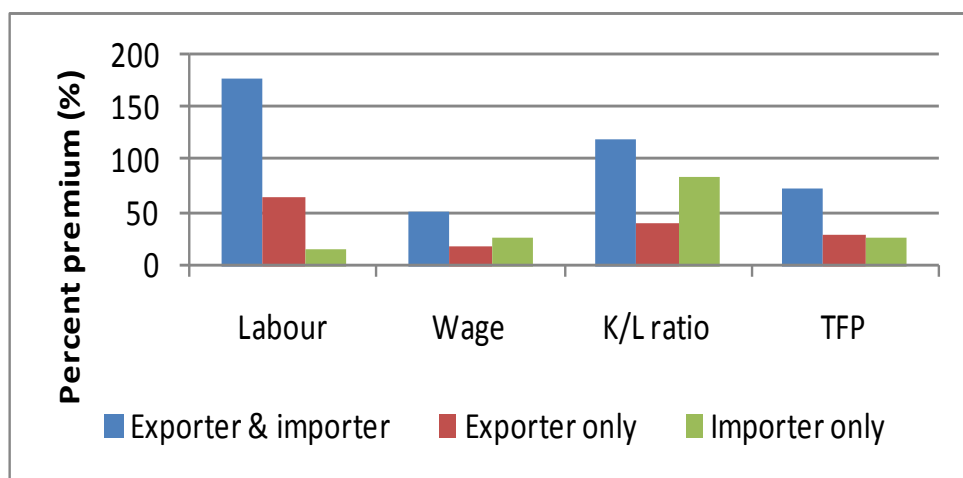
Figure 2: Comparing productivity levels across the size distribution of manufacturing firms



Source: Kreuser and Newman (2016)

The third principal result relates to trade. The relationships are illustrated in Figure 3. The figure compares manufacturing firms that engage in international trade relative to manufacturing firms that do not. The mainline result is that firms that engage in international trade employ more people, pay higher wages, have more capital, and exhibit higher levels of productivity. While these observations hold for firms that are exporters or importers only, the results are particularly striking for firms that both engage in exports and directly purchase imported intermediates. Similar results hold for export destinations and products: firms that export to developed countries and/or to multiple destinations and/or multiple products tend to exhibit higher levels of productivity (Matthee et al. 2016).

Figure 3: Premia over non-trading firms in manufacturing (2009–13)



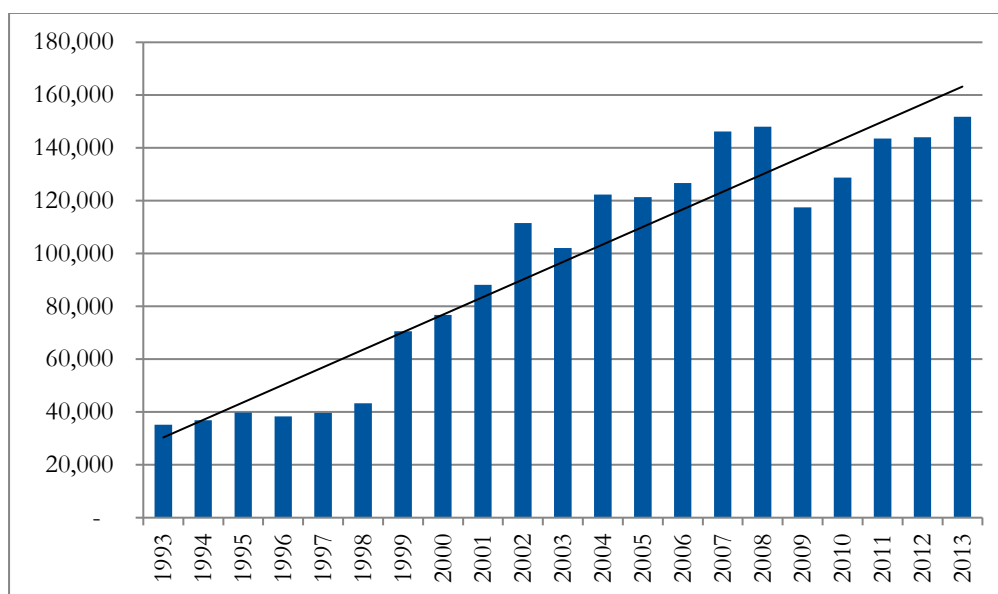
Source: Edwards et al. (2016)

As pointed out by Edwards et al. (2016), these results correspond with available international evidence from both advanced and emerging countries and are consistent with a view of positive spillovers from international trade (see Hiep and Ohta 2009 for a comparison to Vietnam). International linkages related to imports allow South African firms to exploit the knowledge and technologies embedded in those imports. Exporters have opportunities to expand along relatively flat world demand curves and are obliged to stay abreast of global innovations to remain competitive. In sum, the broad links between openness, via linkages to international markets through imports and exports, and potential for rapid economic growth apply to South Africa.

3.3 Services exports

Since 1993, the general openness of the South African economy has increased from the artificially depressed levels of the apartheid era. Imports as a share of total supply have risen from about 9 per cent to about 14 per cent. Perforce, exports as a share of total demand have increased from about 10 per cent to about 13 per cent in 2013. Growth in the real volume of mining exports, which comprised about 43 per cent of exports in 1993, has been very tepid. To help maintain the current account balance, exports of agricultural products and manufactures have grown more rapidly than the rest of the economy. However, the most marked export growth has occurred in services. Growth in real services exports is shown in Figure 4.

Figure 4: Real services exports in millions of 2010 Rand



Source: Social Accounting Matrix real series (van Seventer 2015b)

Figure 4 shows that, despite a slow start, the volume of services exports more than quadrupled from 1993 to 2013 and their share in real export volumes more than doubled, reaching 18 per cent of total exports in 2013 according to the real SAM time series data. Furthermore, this measured growth in services trade is almost surely understated. In 1993, South African banks, insurance companies, retailers, and engineering consultancy companies had a light to non-existent footprint in the rest of Africa. Today, companies from these and other service industries have well established presences throughout the continent contributing to the measured growth in services exports. In addition, many functions, such as inventory management in retail chains located abroad, are performed in South Africa. As a second example, the South African Reserve Bank provides financial processing services to other central banks throughout the continent. These are effectively services exports; however, capturing them in official trade statistics is difficult.

Finally, services and manufactured exports interact. As discussed in das Nair and Chisoro (2015), the rapid spread of South African supermarket chains throughout Africa has greatly facilitated exports of South African foods and consumer products. The competitiveness and profitability of South African exports of equipment, such as mining equipment, are boosted by service contracts that assure that the equipment will remain operational (Fessehaie et al. 2016a and 2016b). These and other factors have served to dramatically increase the role of trade with Africa over the past two decades. For example, once basic metals and chemicals are excluded, Africa now represents the single largest destination for South African manufactured exports, surpassing the EU in 2011 (Fessehaie and Roberts 2016).

Services exports, as well as advanced manufactures, often require high skills. All of the examples of services provided above rely on skilled labor inputs, with potential implications for wages. Wages and wage inequality are in focus in the next section.

3.4 Wages and wage inequality

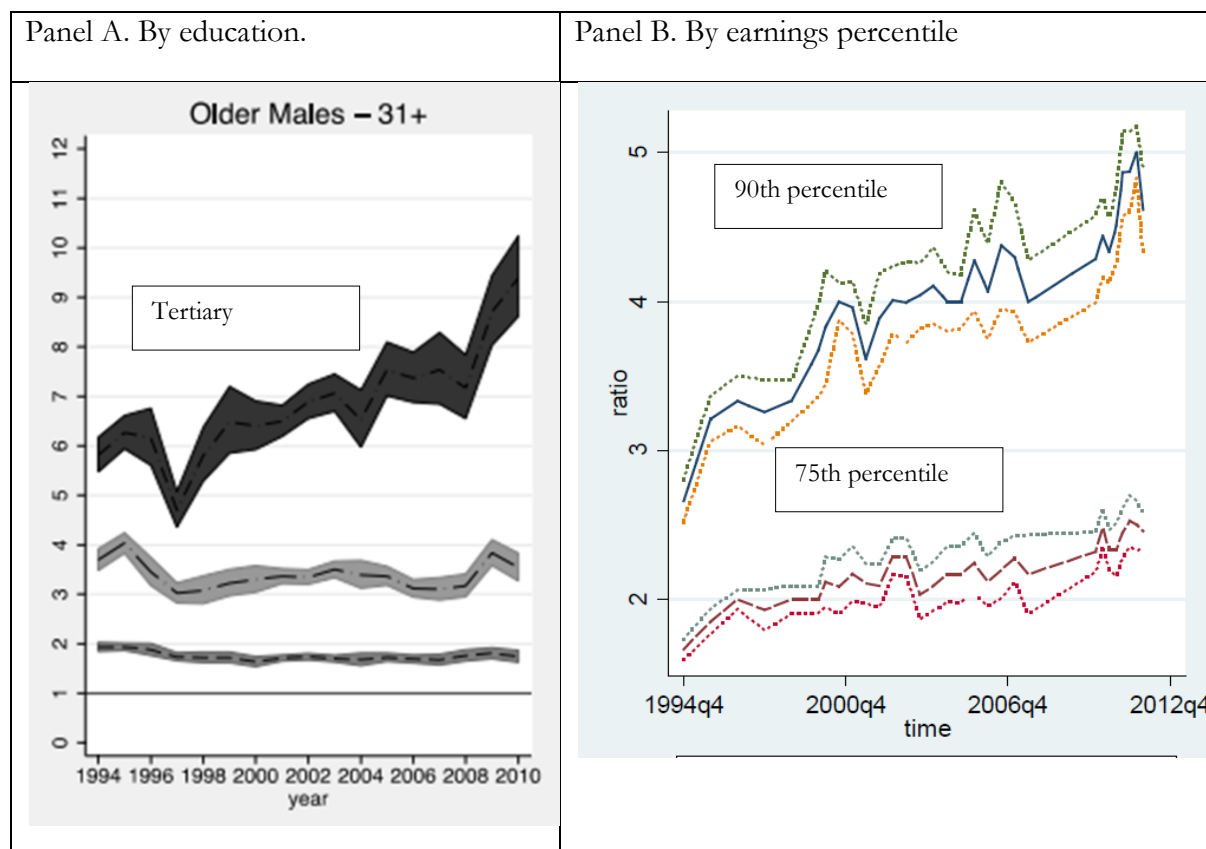
Income inequality in South Africa has remained persistently very high despite the important social, political, and economic structural shifts that have occurred since 1993. A principal conclusion from the REDI project is that increasing wage inequality has been a major factor offsetting efforts to improve the distribution of income.

Trends in wage inequality are illustrated in Figure 5. Panel A focuses on the relative wages of males aged 31 or greater by level of education. In 1994, wages of tertiary educated males were a bit less than six times greater than those with only primary education or less. By 2010, the ratio had expanded to nearly 10. Panel B illustrates the same effect using a different approach. It plots the ratio of those earning at the 90th and 75th percentiles of the wage distribution versus the median wage (50th percentile). Once again, wages for those at the upper end of the wage distribution (the 90th percentile) increased substantially relative to median wages. The ratio passed from about 2.7 in 1994 to a bit less than 5.0 in 2011.

In sum, both measures point to a near doubling of the premium for highly skilled labour over the period in question. Recent analysis by Borat et al. (2016) confirms that individual characteristics (as opposed to the characteristics of the firms in which the individual works) ‘explain the bulk of wage variation’ (p. 1). Borat et al. (2016) point to skills related factors, such as education, in the determination of wages. These results highlight the importance of skills and skills acquisition by the labour force.

It is important to highlight that, by international standards, wage inequality in South Africa began at high levels and, more importantly, has subsequently worsened at a very rapid rate. For example, Gould (2016) tracks recent wage inequality trends in the United States. Wage inequality in the United States has been worsening for 35 years. Gould focuses analysis on the 2000 to 2015 period. By education level, the ratio of wages of those with advanced degrees compared with those with less than complete secondary (a conceptually similar but not the same measure as in panel A of Figure 6) rose from a bit less than three in 2000 to a bit more than three in 2015, an increase of about 3.5 per cent. Gould's analysis in terms of wage percentiles (the same measure Wittenberg employs for RSA shown in panel B) tells qualitatively the same story. This ratio in the USA rose by 11 per cent from about 2.2 to about 2.5 over the 2000 to 2015 period. In sum, compared with the USA, the South African wage distribution was more unequal in 1994 than the USA in 2015 (even though this ratio in the USA has been monotonically increasing for 35 years). More importantly, the negative trend in wage inequality is vastly more dramatic in RSA.

Figure 5: Wage inequality trends



Notes: Panel A shows wage ratios of males aged 31 or greater with tertiary education (top dashed line) compared with those with primary school education or less. The middle and bottom dashed lines examine those with complete secondary and incomplete secondary respectively relative to those with primary school education or less. The dark bands illustrate the 95 per cent confidence interval. Panel B shows wage ratios for those at the 90th and 75th percentiles of the wage distribution relative to the median. Dotted lines provide upper and lower confidence bounds.

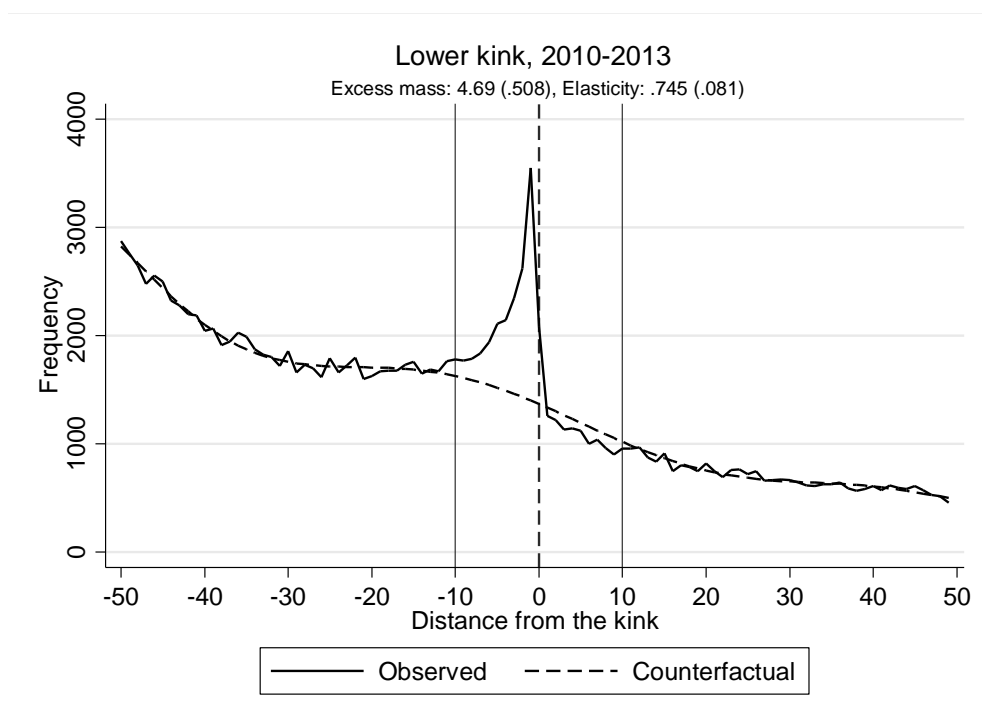
Sources: Panel A. Branson and Leibbrandt 2013. Panel B. Wittenberg 2014 (reproduction permission by request)

3.5 Tax incentives

The administrative record data from SARS also illustrates that firms respond to tax incentives. Boonzaaier et al. (2016) provide a vivid illustration of the implications of (in this case implicit) incentives embedded in the tax code. The South African Corporate Income Tax (CIT) schedule has two important discontinuities. The standard CIT rate is 28 per cent of taxable income. However, Small Business Corporations (SBCs) have a graduated schedule. In 2011–12, they did not pay tax on taxable income under R60,000, and then were taxed at a rate 10 per cent on income between R60,000 and R300,000, after which they paid 28 per cent.

Each of these thresholds creates kinks in the schedule of average tax rates. Evidence drawn from corporate tax data for the years 2010–13 suggests these kinks affect firm behaviour. Figure 6 shows that there is considerable bunching of firms just below the lower kink, implying that firms either declare or maintain taxable income just below the point where the rate changes from 0 per cent to 10 per cent. This bunching just below the threshold is mirrored by the number of firms just above it being lower than expected. This suggests that when firms can no longer delay crossing the threshold, they cross it substantially. Similar bunching is found for the upper kink in the CIT schedule and at the point of sales volume where firms are required to register to collect value added tax.

Figure 6: Bunching of firms around the lower kink of CIT, 2010–13



Note: Distance from the kink measured in thousands of rand

Source: Boonzaaier et al. (2016)

As discussed in Boonzaaier et al (2016), the implications of these kinks for growth and employment are not clear and require further research. It is clear that firms respond to tax incentives, at least in respect to their declarations to SARS. In an attempt to influence firm behaviour in a manner consistent with broader economic and social objectives, explicit tax incentives have been offered. Prominent among these initiatives is the Employment Tax Incentive (ETI), which was put in place in January 2014 and aims to increase youth employment by reducing the relative cost of hiring young workers in lower-wage occupation categories. Ebrahim, Leibbrandt and Ranchod (2016) and Makgetla (2016) both employ the SARS administrative tax record data, but use different approaches, to examine the ETI.

Their findings are similar. Neither analysis finds that the ETI has (as yet) succeeded in boosting youth employment on average. Ebrahim, Leibbrandt and Ranchod (2016) do find a statistically significant effect on youth employment in firms with fewer than 200 employees. Makgetla (2016) finds that firms who use the incentive are typically large and faster growing. Importantly, these firms also tend to increase the share of younger employees in the firm. However, the ETI has yet to generate a detectable overall net gain in jobs for young people.

Among the potential explanations behind these results are: (i) the ETI has not been in place long enough to generate detectable overall impacts; (ii) the ETI is particularly attractive to firms that are growing and who would be hiring with or without the ETI; and (iii) the wage of lower earning youth workers is only one of many considerations related to hiring of younger workers. The first explanation would call for patience. The latter two would indicate, at best, that the ETI would perform better in conjunction with other complementary policies that enhance growth and reduce

barriers to employing youth that are not related to their wage.⁵ In reality, all three explanations are likely to be in play, and the failure of the ETI to generate detectable employment impacts should temper expectations and raise the profile of complementary measures.

3.6 Markups and concentration

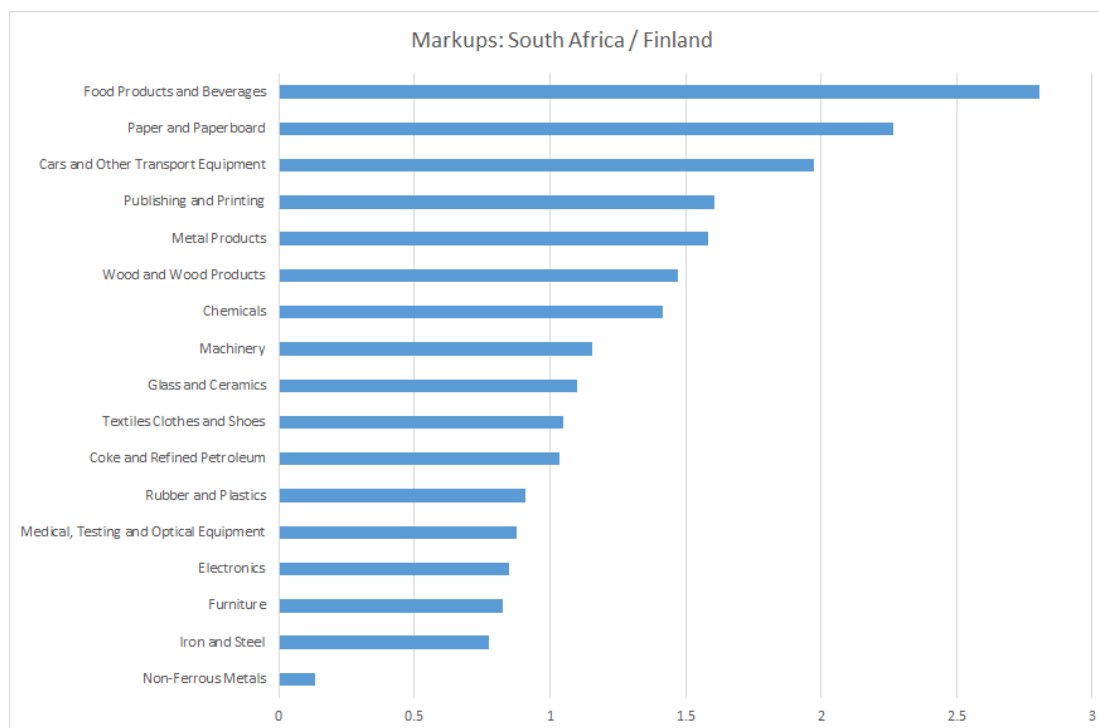
The administrative tax data from SARS also opens the potential for new insights into markups and concentration. In a competitive environment, high profits (markups) could be a driver of growth. Industries exhibiting high profits should experience high volumes of investment, as incumbents expand and new players enter (both seeking to exploit the high profit opportunities). For firms selling mainly non-traded items on the domestic market, the increased production volume due to investment and employment growth should reduce prices/markups as domestic supply rises relative to domestic demand. For exporters, increased production and exports may have little impact on world market prices allowing for substantial expansion until factor prices, notably wages, rise to the point where excess profits are eliminated (a result that is, as noted in section 3.1, not yet observed in South Africa, at least in the sectoral data).

Failures of competition, such as barriers to entry, could short-circuit this growth process. Firms operating behind the shelter of significant barriers to entry may prefer not to expand output. This could be the result of an effort to maintain high prices for their products and correspondingly high levels of profitability. It could also be because incumbent firms judge the risk-adjusted return to efforts to preventing entry by other firms exceed the returns to increased production (potentially including in export markets).

Fedderke et al. (2016) consider these issues for South Africa using the SARS data for manufacturing firms. Their estimated markups for South Africa are broadly high relative to earlier estimates and relative to comparable estimates from Finland. A comparison of markups between Finland and South Africa is shown in Figure 7 for 17 manufacturing sectors. In seven sectors, markups are notably higher in South Africa compared with Finland. However, in 9 of the 10 remaining sectors, markups are similar. With respect to concentration ratios, similar heterogeneity is observed across sectors with the ratios being relatively high in South Africa on average compared with the United States.

⁵ Kanbur (2015, p. 5) states that a ‘focus in the short run [meaning 3-5-7 years] may have to be to reduce non-labour costs of private sector employment as the feasible and desirable track.’

Figure 7: Markups in South Africa (2009-13) compared with comparable estimates from Finland



Source: Fedderke et al. (2016)

4 Broad implications

A series of broad implications emerge:

1) Openness poses challenges; nevertheless, openness also provides substantial growth opportunities through links to global demand and technical advances. Democratic elections in 1994 initiated a still ongoing process of engagement with the global community pushing up demand for imports and opening opportunities for export. Stagnation in mining placed the onus on other exporting sectors to grow. This onus remains as mining still represents around 30 per cent of exports. To exploit the opportunities available in international markets and to facilitate transition away from dependence on mining exports, *export oriented policies* are required.

Access to high quality imported intermediate inputs is an important component of an export orientation. There also appears to be space for enhanced competition from imports to reduce markups and spur firm productivity and growth.

2) In manufactures, South Africa's most productive firms are larger and much more likely to engage in direct importing and/or exporting. In terms of breaking out of the current economic malaise, *large, productive firms with existing links to international markets may have the highest near-term growth potential.*

3) South Africa has a *revealed comparative advantage in services exports*. The past two decades also illustrate that South Africa has done relatively well *in supplying rapidly growing African markets* more generally (Arndt and Roberts 2017). These two features interact as in the examples of servicing mining equipment and the sale of consumer goods in South African supermarkets located abroad.

4) Economic growth in South Africa appears to be *powerfully skills-constrained*. Wage trends strongly indicate that demand for skilled labour has chronically exceeded supply causing highly skilled wages to rise dramatically. Part of this rise can be explained by global forces, notably skills biased technical advance. However, by international standards, wage inequality in South Africa began at high levels around 1994 and has subsequently worsened at a very rapid rate.

This extraordinary rapidity of the rate of change in highly skilled versus lower skilled wages that has occurred over the past two decades points to local factors. Growth in services exports and high-quality manufactures, both of which frequently require substantial inputs of highly skilled labour, has almost surely contributed to the relative rise in highly skilled wages. The post-apartheid expansion of government provided public services and concomitant skilled labour requirements to design and manage these services within the public sector are a second likely contributing factor.

The skills constraint has been fingered before in external assessments of principal factors constraining growth. Levinsohn (2007), who engaged with the National Treasury in an effort specifically designed to identify growth bottlenecks, pointed to the skills constraint as a major factor slowing growth. Hausman (2016), drawing on Levinsohn, specifically cites the benefits of more open skilled migration policies for South Africa. Leibbrandt, Finn, and Woolard (2013) point to the very rapid acceleration in wage inequality since 1994 as a major factor perpetuating very high levels of income inequality. Hence, skilled immigration holds the potential to increase growth, by relieving the skills constraint, and reduce inequality, by cooling of the skilled wage premium.

Hausman (2016) also points out that opposition to skilled migration is curiously widespread globally despite very strong evidence that skilled migrants bring considerable economic benefits almost everywhere. While there are no easy or sure-fire solutions to South Africa's growth, employment, and inequality woes, policies targeted at attracting and effectively absorbing highly skilled labour to South Africa appear to have strong potential, notably in the relatively near term. Properly designed, they could respond to each of the four implications listed above with genuine possibilities to increase growth, reduce unemployment, expand government revenue, and mitigate inequality. From an economic viewpoint, this is an attractive package that could form a part of a concerted effort to escape from South Africa's long running economic malaise.

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