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Employment creation potential, labor skills requirements and skill gaps for young people

A South African case study

Caitlin Allen, Zaakhir Asmal, Haroon Borhat, Robert Hill, Jabulile Monnakgotla, Morné Oosthuizen, and Christopher Rooney



Caitlin Allen is a research analyst at the Development Policy Research Unit (DPRU) at the University of Cape Town.

Zaakhir Asmal is senior research analyst at DPRU.

Haroon Borat is director of DPRU and a nonresident senior fellow at the Africa Growth Initiative at the Brookings Institution.

Robert Hill is a research analyst at DPRU.

Jabulile Monnagotla is a research analyst at DPRU.

Morné Oosthuizen is deputy director at DPRU.

Christopher Rooney is a research analyst at DPRU.

Corresponding author: Haroon Borat (haroon.bhorat@uct.ac.za)

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Contents

1.	Introduction	1
2.	Country context.....	2
3.	Patterns of growth and structural transformation	5
4.	Sectoral decomposition: IWOSS in comparative perspective with non-IWOSS.....	8
5.	Constraints to IWOSS growth.....	16
	5.1 Constraints to growth: The broad operating environment for firms in South Africa	16
	5.2 Constraints to growth in specific IWOSS sectors.....	17
	Tourism	17
	Horticulture	20
	Agro-processing.....	22
	Transit trade (logistics)	23
6.	Trends into the future: A labor force survey-based analysis of potential growth and labor demand of IWOSS	25
	6.1 Labor-to-value added ratios.....	26
	6.2 Employment projections and skill gaps	27
	The current growth path	27
	Beyond the current growth path.....	31
7.	Firm survey results	35
	7.1 Approach.....	36
	7.2 Youth employment: Current and expected	38
	7.3 Skill requirements for the youth	39
	Formal education requirements.....	39
	Hard, soft, and digital skill requirements.....	40
	7.4 Skill gaps of the employed youth	42
	7.5 Overall insights	43
8.	Policy recommendations.....	45
	8.1 Facilitating an enabling operating environment to promote economic growth.....	45
	Infrastructure.....	45
	Government spending.....	46
	8.2 Focused policies that enable the growth of specific IWOSS sectors	46
	Tourism	46
	Horticulture	47
	Agro-processing	48
	Transit trade (logistics)	48
	8.3 Developing skills to support the growth of IWOSS sectors.....	49
	8.4 Promoting inclusive growth: Policy must be cognizant of the most vulnerable	50
9.	Conclusion	51
	References	53
	Appendix A: Data tables.....	60
	Appendix B: Firm survey responses	63
	A. Overview of activities of firms by sector	63
	B. Skill requirements by sector	67
	Appendix C: Data collection instrument	74

1. Introduction

Structural change is taking place in Africa, but with a pattern that is distinct from the historical experience of the industrialized countries and contemporary East Asia: In short, export-led manufacturing is playing a much smaller role in the structural transformation of Africa's economies. Services—some with quite low productivity—absorb the bulk of African workers leaving agriculture and moving to cities. These changes reflect the impact of technological progress and a changing global marketplace on Africa's prospects of industrialization.

At the same time, reductions in transport costs and advancements in information and communications technology have led to the creation of services and agri-businesses that share firm characteristics with manufacturing.¹ Like manufacturing, they are tradable and have high value added per worker. These sectors have the capacity for learning and productivity growth, and some exhibit scale and agglomeration economies (Ebling and Janz, 1999; Ghani and Kharas, 2010). For lack of a better term, these are termed “industries without smokestacks” (IWOSS) to distinguish them from traditional, “smokestacks” industries (Page, 2020). These IWOSS may have the potential to fulfill the role traditionally assumed to be that of manufacturing in structurally transforming an economy. In this paper, we consider whether these sectors have the potential to generate the employment required to address high and growing unemployment in South Africa specifically.

South Africa has been in a long-run, low-growth trap since the onset of democratic rule in 1994. The result has been modest reductions in household poverty levels, coupled with high and rising inequality. The labor market is the primary driver of this rise in inequality, with a significant number of zero earners in the income distribution. South Africa's unemployment rate and, more specifically, its youth² unemployment rate—at 29 percent and 56 percent, respectively—are considerably higher than comparable upper-middle-income countries or other countries in sub-Saharan Africa and have been on a clear upward trend since 2008.

South Africa's current economic growth trajectory is not producing the volume and type of jobs required to reverse these trends in inequality and unemployment. Manufacturing, traditionally one of the largest employers of low-skilled workers, has experienced an annual growth rate of less than 1 percent between 2010 and 2018. Instead, there has been a shift toward services sectors.

This shift toward services—without manufacturing growth—is characteristic of much of Africa. South Africa, however, is an outlier among other African countries. Elsewhere in Africa, the move has been largely characterized by a shift into low-productivity services, often in the informal sector. In South Africa, the shift has been to financial and community services, which are relatively high-productivity sectors in which jobs are more likely to be high-skilled. The shift towards formal sector services has, thus, not generated the jobs needed to reduce unemployment and inequality.

In the absence of growth in the manufacturing sector, South Africa already appears to be on a path of structural transformation characterized by a shift toward IWOSS, more specifically those in financial, business, and community services. However, within the broader IWOSS category, there are however a number of other sectors that may be better suited to address South Africa's employment and inequality challenges.

¹ See Baumol (1985) and Bhagwati (1984).

² In this report, youth are considered to be individuals aged between 15 and 24.

In this paper, we consider the case for specific IWOSS sectors to drive structural transformation that is inclusive and able to generate employment across the skills distribution. We also consider the skill requirements for the potential of these sectors to be realized. The paper focuses on the following key questions:

1. What are the IWOSS sectors best poised for economic growth and job creation in South Africa?
2. What are the constraints to the development of IWOSS in South Africa?
3. What is the employment potential of IWOSS sectors for youth in South Africa?

To consider these questions, we provide a quantitative analysis of labor force survey data and conducted a survey of firms operating in IWOSS. For the quantitative, a series data on gross value-added (GVA) and individual labor market activities data obtained from Statistics South Africa.³ We also make use of O*NET, a standardized database of skill requirements from the United States for over 1,000 occupations (O*NET, 2019). The O*NET database provides information on numerous measures such as skills, knowledge, abilities, and education levels required for a particular occupation (O*NET, 2019). The firm survey on employment potential and skill requirements supplements the results of the quantitative analysis. These firm interviews were conducted in the tourism, agro-processing, horticulture, and transit trade sectors. These four IWOSS sectors were selected based on their ability to create several types of jobs across the skills spectrum in South Africa.

The paper proceeds as follows. Section 2 provides an overview of the South African economy. Section 3 considers patterns of growth and structural transformation in South Africa. Section 4 considers the employment composition of IWOSS sectors in comparison to non-IWOSS sectors in South Africa. Section 5 provides a closer look at four specific IWOSS sectors, noting their potential for growth and employment through an understanding of the value chains of these sectors, as well as the constraints to growth in these sectors. Section 6 provides a high-level analysis of the employment potential of IWOSS sectors. Section 7 supplements the employment potential and skill gap analysis of Section 6 with the findings of interviews conducted with 18 firms across the four chosen IWOSS sectors. Section 8 discusses policy recommendations for enabling growth in IWOSS sectors. Section 9 concludes.

2. Country context

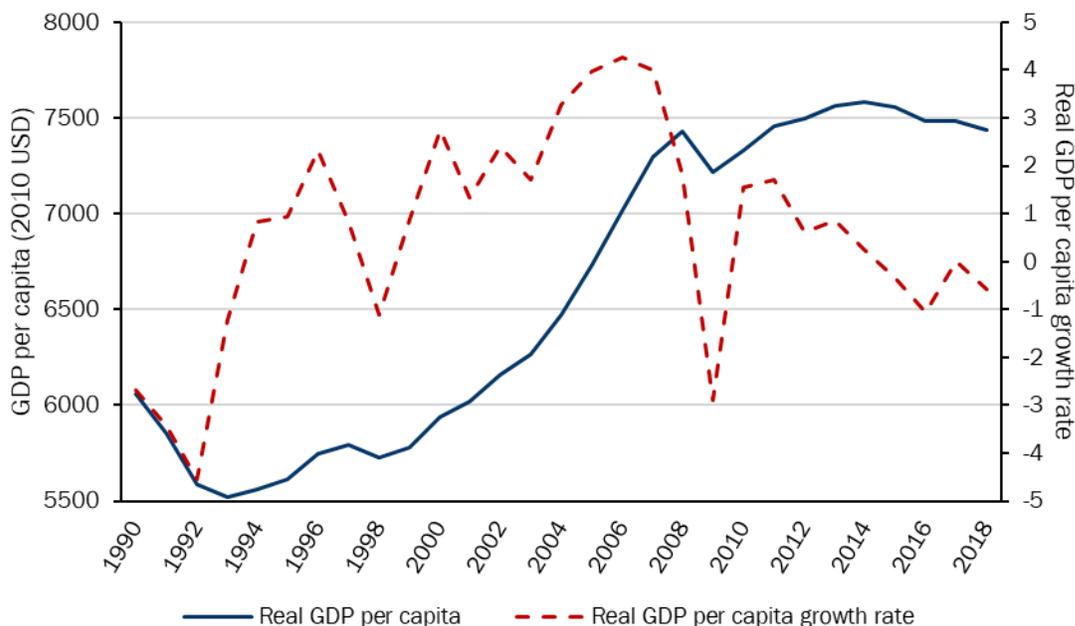
The South African economy has been characterized by a long-run, low-growth trap since the end of apartheid in 1994. Figure 1 illustrates this and displays real GDP per capita and the real GDP per capita growth rate from 1990 to 2018. Although GDP has generally been growing steadily since international sanctions were lifted in 1994, recent growth rates have been weak. Negative growth is observed in 1998, followed by low growth of between 1 and 3 percent, and a sharp decline in 2009. Since 2010, real GDP per capita growth has been below 2 percent, with the rate of growth turning negative in 2014.

The impact of this poor economic growth on the labor market has been significant: In 2018, there were 16.4 million individuals employed in the South African economy, with 6.1 million unemployed, rendering a national unemployment rate of 27.1 percent (Table 1). If we include discouraged work seekers—defined as those who want work but are not actively seeking employment—then a further 2.8 million unemployed are added, resulting in an expanded unemployment rate of 35 percent. The situation is particularly dire for youth aged 15 to 24 years: The narrow and expanded unemployment

³ In this report, we use version 3.3 of Post-Apartheid Labour Market Series (PALMS) dataset (Kerr, Lam and Wittenberg, 2019), which incorporates Quarterly Labour Force Surveys from Statistics South Africa, as well as other labor force survey data.

rates for youth are substantially higher than that of the overall population at 53.4 percent and 64 percent, respectively.

Figure 1. Real GDP per capita values and growth rates, 1990-2018



Source: World Bank, 2020.

The table shows that this increased unemployment rate has been the result of inadequate growth in employment relative to growth in the labor force. Between 2010 and 2018, the narrow labor force grew approximately 14 percent faster than employment, with the labor force growing at 3.3 percent per year, compared to growth in employment of 2.9 percent per year.

Real employment growth between 2001 and 2019 has consistently fallen short of the target growth rate (TGR),⁴ the rate of change in employment required to absorb all net labor market entrants over the period into employment. Over this period, the TGR for employment was 39.1 percent; however, employment grew by only 25.5 percent. Over this period, the TGR for employment was 39.1 percent; however, employment grew by only 25.5 percent—resulting in an employment absorption rate of 65.3 percent. This persistent failure of the labor market to absorb the ever-increasing growing labor force has led to the current employment crisis.

4 The target growth rate (T_g) is measured by: $T_g = \frac{EAP_{gt} - EAP_{gt-1}}{L_{gt-1}}$ where EAP refers to the economically active population for group g , and L is the number of employed individuals by any given covariate. The employment absorption rate (ER_t) is the ratio between the actual employment growth and the desired (or “target”) rate and is expressed as a percentage as follows: $ER_t = \frac{\frac{L_{gt} - L_{gt-1}}{L_{gt-1}}}{T_g} = \frac{L_{gt} - L_{gt-1}}{EAP_{gt} - EAP_{gt-1}}$

Table 1. Employment patterns and salient features in South Africa, 2010-2018

	2010	2018	Absolute change	Annualized % change
Labor market aggregates ('000)				
Working-age population	32,007	37,907	5,900	2.1
Employment	13,061	16,394	3,333	2.9
Narrow unemployment	4,332	6,103	1,771	4.4
Narrow labor force	17,393	22,496	5,103	3.3
Expanded unemployment	6,330	8,909	2,579	4.4
Expanded labor force	19,391	25,303	5,912	3.4
Discouraged work seekers	1,998	2,806	808	4.3
Labor force participation rate (LFPR) (%)				
Narrow LFPR	54.3	59.3	5.0	1.1
Youth narrow LFPR	25.9	25.4	-0.5	-0.2
Expanded LFPR	60.6	66.7	6.2	1.2
Youth expanded LFPR	32.3	32.9	0.6	0.2
Unemployment rate (%)				
Narrow unemployment rate (all)	24.9	27.1	2.2	1.1
Narrow unemployment rate (youth)	50.5	53.4	2.9	0.7
Expanded unemployment rate (all)	32.6	35.2	2.6	1.0
Expanded unemployment rate (youth)	60.3	64.0	3.6	0.7
Target growth rate (TGR) (%)		39.1		
Employment absorption rate (%)		65.3		

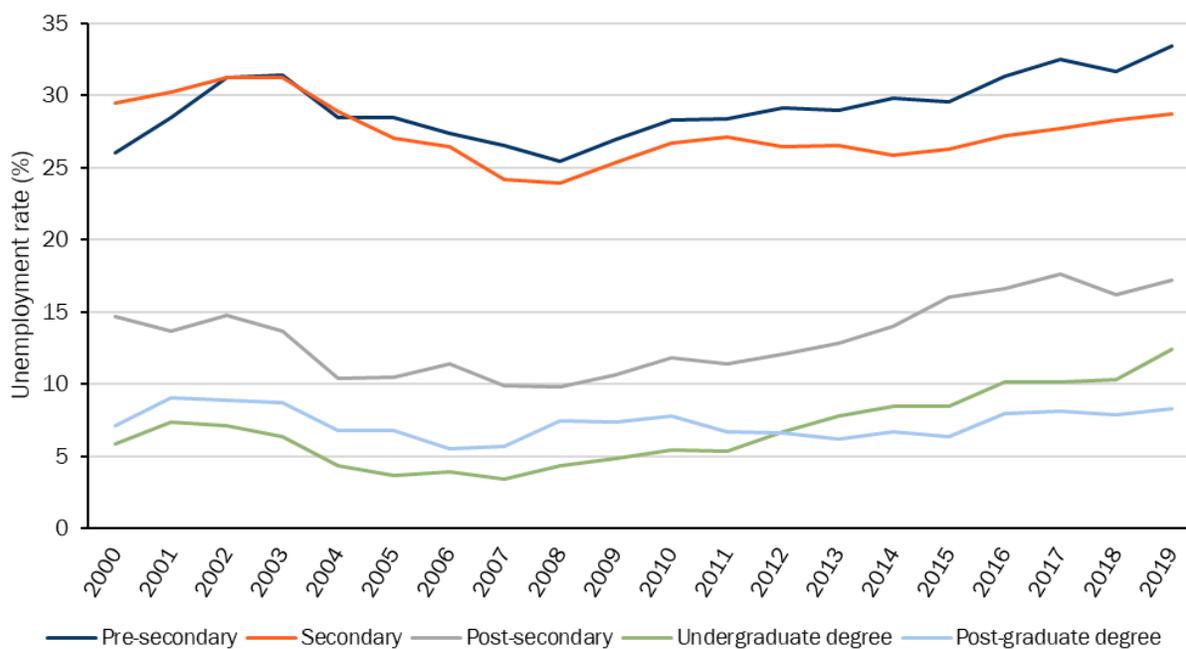
Note: Narrow unemployment refers to individuals who are currently unemployed and who have actively looked for work in the recent past (typically in the past four weeks). Broad unemployment includes the narrow unemployed and the unemployed who are not searching for jobs (Kingdon & Knight, 2005).

Source: Authors' own calculations using StatsSA (2009; 2019b).

Figure 2 highlights the stark differences in unemployment rates between education levels. Those who have not completed secondary education face the highest unemployment rates, although this line is very close to that for individuals who have completed secondary schooling. Degree-holders, both under- and post-graduate, generally see much lower unemployment rates, although unemployment has been increasing among even this group in recent years. Thus, addressing South Africa's unemployment will require not only an increased number of jobs, but also an increased number of the *right* jobs: In short, South Africa is in need of the type of jobs that can provide employment to those with lower levels of education in particular.

It is clear that South Africa's low-growth trajectory is unable to provide the employment required to address the country's high rate of unemployment. Concerningly, it does not seem that the country's growth trajectory will improve considerably in the foreseeable future, as the economy continues to face a number of challenges (which are discussed in greater detail in Section 5).

The next section explores what the nature of South Africa's economic growth trajectory has been, with a view to understanding the changes that may be needed to provide the numbers and types of jobs required to address South Africa's unemployment crisis.

Figure 2. Narrow unemployment rates by education level, 2000-2019

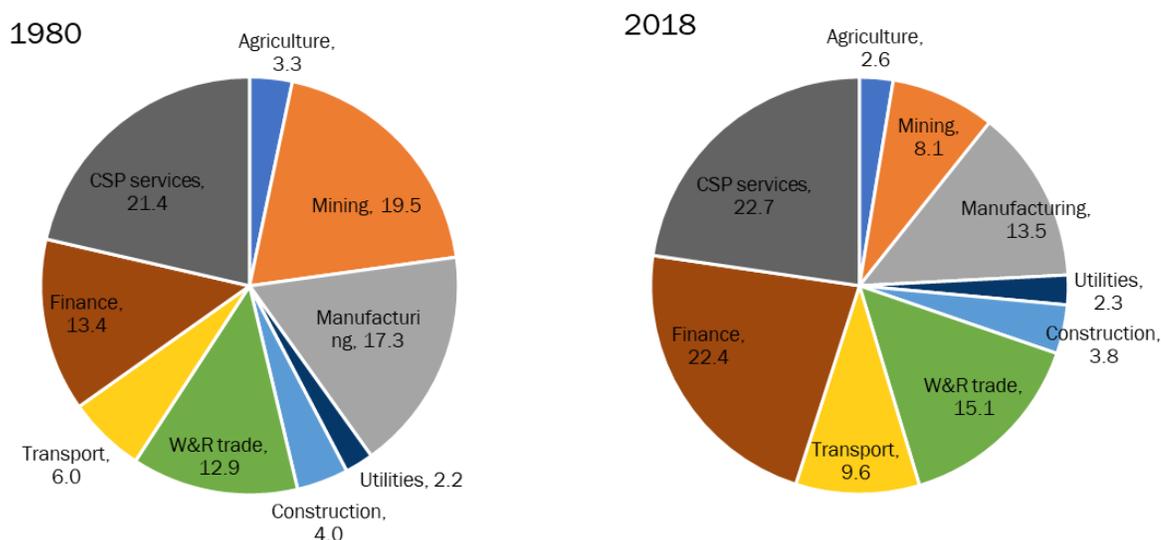
Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

3. Patterns of growth and structural transformation

This section provides an understanding of the sectoral patterns of economic growth in South Africa. Dissecting GDP and employment growth by sector, and assessing changes over time, we aim to highlight the structural formation and transformation of the South African economy.

The shares of output of the country's main sectors in 1980 and 2018 are shown in Figure 3. The most pronounced changes between the two years occur in the mining sector, which saw a decrease of 11.4 percentage points in its share of GDP, and in the financial and business services sector (labeled "Finance" in the figure), which expanded by 9.0 percentage points. Although the changes in manufacturing and agriculture were small, both declined: Manufacturing's share declined from 17.3 percent in 1980 to 13.5 percent in 2018, while agriculture accounted for only 2.6 percent of GDP in 2018, down from 3.3 percent in 1980. These changes clearly illustrate South Africa's shrinking primary sector and growing tertiary services sector, with South Africa currently situated as a services-based economy.

Table 2 below provides an industry-level breakdown of employment between 2010 and 2019. In line with trends in output, the financial and business services sector has seen the largest increase in employment share over the period. Indeed, alongside substantial growth in the sector's share of GDP (a 9-percentage point increase over almost 4 decades), the sector's share of employment expanded by 2.4 percentage points between 2010 and 2018, at a time when total employment grew by 3.3 million. The tertiary sector as a whole accounted for almost 75 percent of employment growth over the period. Manufacturing, on the other hand, accounted for only 1 percent of the change in employment over the same time period. Agriculture and mining fared only slightly better, accounting for 6.2 percent and 3.4 percent of total employment growth respectively. These trends confirm that tertiary services are an avenue for both GDP and employment growth.

Figure 3. Contribution to GDP by industry, 1980 and 2018 (percent)


Source: SARB (2019).

Note: CSP services = community, social, and personal services; W&R trade = wholesale and retail trade.

Table 2. Employment by sector, 2010-2018

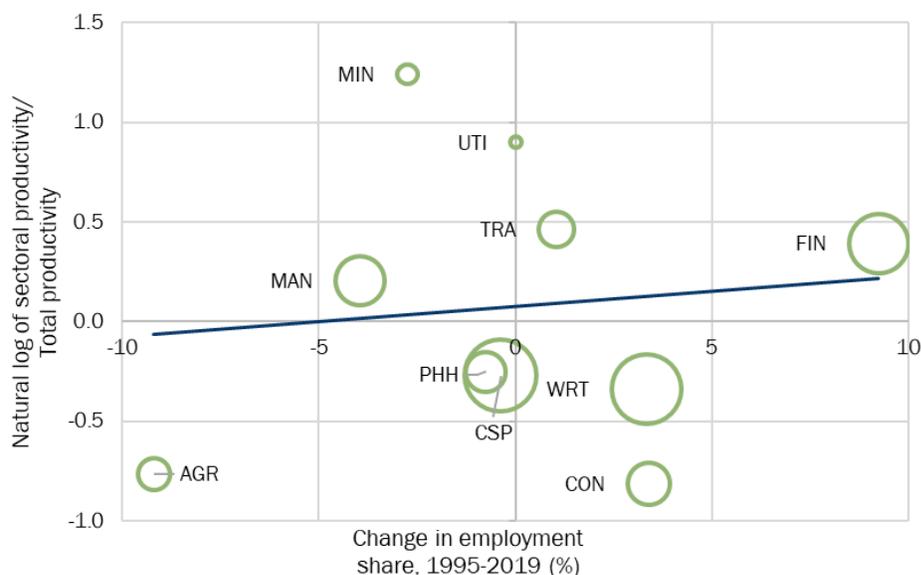
Sector	Employment ('000)		Employment share (%)		Absolute change ('000)	Share of change (%)	Annual % change
	2010	2018	2010	2018			
Agriculture, forestry, and fishing	639	845	4.9	5.2	207	6.2	3.6
Mining and quarrying	305	419	2.3	2.6	114	3.4	4.1
Primary sector	943	1 264	7.2	7.7	321	9.6	3.7
Manufacturing	1,739	1,769	13.3	10.8	30	0.9	0.2
Electricity, gas, and water	90	148	0.7	0.9	58	1.7	6.4
Construction	1,060	1,472	8.1	9.0	412	12.4	4.2
Secondary sector	2,890	3,390	22.1	20.7	501	15.0	2.0
Wholesale and retail trade	2,927	3,280	22.4	20.0	353	10.6	1.4
Transport, storage, and communication	774	984	5.9	6.0	210	6.3	3.0
Financial and business services	1,656	2,479	12.7	15.1	823	24.7	5.2
Community, social, and personal (CSP) services	2,727	3,694	20.9	22.5	967	29.0	3.9
Private households	1,140	1,292	8.7	7.9	152	4.6	1.6
Tertiary sector	9,224	11,729	70.6	71.5	2,505	75.2	3.0
Total	13,061	16,394	100.0	100.0	3,333	100.0	2.9

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

Figure 4 brings together output and employment growth to get a full picture of industry changes over time. Following the methodology outlined by McMillan and Rodrik (2011), Figure 4 shows the correlation between the natural log of relative productivity (measured as value added per worker), and

the change in employment by industry for South Africa between the period 1995 to 2016. The size of the bubble represents the sector's share of employment in 2016. The linear regression line indicates whether the structural transformation is growth-inducing (positively sloped) or not (negatively sloped). The desired change over time would be declining shares of employment in low-productivity sectors (the lower left quadrant) and increased shares of employment in high productivity sectors (the top right quadrant).

Figure 4. Correlation between sectoral productivity and change in employment in South Africa, 1995-2019



Source: Authors' calculations using South African Reserve Bank [SARB] (2019).

Note: AGR = agriculture; MIN = mining; MAN = manufacturing; UTI = utilities; CON = construction; WRT = wholesale and retail trade; TRA = transport services; FIN = financial and business services; CSP = community, social, and personal services; PHH = private households.

For South Africa, between 1995 and 2019, although the slope of the regression line in Figure 4 is positive, the estimated coefficient is insignificant (p -value=0.72), indicating that there is no evidence of growth-inducing structural transformation. In other words, labor resources have shifted from low-productivity sectors such as agriculture to other low productivity sectors such as CSP services, wholesale and retail trade, and transport. To a lesser extent, employment has also shifted to higher-productivity sectors like construction, and financial and business services.

This structural transformation pattern contrasts with what has been observed in East Asian countries, with manufacturing in the top right quadrant—i.e., a shift in labor resources toward high-productivity manufacturing industries. In South Africa's case, the opposite has occurred, with manufacturing in the top left quadrant, suggesting a shift of labor away from this high-productivity industry. Shifts toward higher-productivity activities have been concentrated in the financial and business services and transport sectors—both predominantly tertiary sectors.

These trends in productivity growth, combined with the increase in employment shares of finance and transport in particular, suggest that non-manufacturing sectors—specifically tertiary sectors—are already an important component of the South African economy. Unlike emerging economies in Asia, structural transformation in South Africa has gone straight from low-productivity agriculture to high-productivity services, with no stop at manufacturing along the way.

It is clear that South Africa has bypassed the traditional Lewis model of structural transformation and begun the process of deindustrialization. In the context of this deindustrialization, this paper explores whether other sectors that share a number of characteristics with manufacturing (so-called “industries without smokestacks,” or IWOSS) have the potential to fulfill the role of manufacturing in the structural transformation of an economy, when manufacturing is unable to do so. To do so, we start with a detailed comparison of the composition of employment in IWOSS and non-IWOSS sectors in the next section.

4. Sectoral decomposition: IWOSS in comparative perspective with non-IWOSS

We have presented an overview of the trends in growth and structural transformation in South Africa, noting a decline in manufacturing and a shift toward services instead. The decline in manufacturing is concerning given that this sector has been widely understood to be a key driver of structural transformation in an economy. In this section, we begin to consider whether other sectors, which share a number of characteristics with manufacturing, have the potential to fill the role traditionally expected to be that of industrialization in an economy.

These sectors, as we have already noted, can be termed “industries without smokestacks.” They have the following shared characteristics:

- i. They are tradable;
- ii. They have high value added per worker relative to average economy-wide productivity;
- iii. They exhibit the capacity for technological change and productivity growth and showing some evidence of scale and/or agglomeration economies; and
- iv. They have the ability to employ large numbers of low- and moderately-skilled labor.

We have identified eight such IWOSS sectors in the private formal sector in South Africa. These are agro-processing, horticulture, commercial agriculture (excluding horticulture), tourism, information and communication technologies (ICT), transit trade,⁵ financial and business services, and trade.

In this section, we consider employment in these IWOSS sectors in comparison to the non-IWOSS sectors. The non-IWOSS sectors include mining, manufacturing (excluding agro-processing), construction, utilities, and community, social and personal services. Informal, government and domestic employment are excluded from consideration in the discussion of IWOSS versus non-IWOSS sectors as we are concerned only with those sectors that have the potential for wide-scale expansion to absorb the labor force.⁶ The discussion is restricted to employment and not GDP, as disaggregated IWOSS-sector level GDP data is not available.

We compare first the numbers of jobs in IWOSS sectors to those in non-IWOSS sectors, noting to what extent IWOSS sectors account for formal private employment in South Africa. We then consider the demographic and skills profile of employment in the IWOSS sectors (as a whole) in comparison to the non-IWOSS sectors. We finally consider the profile of employment in the individual IWOSS sectors to

⁵ Transit trade refers to “the business connected with the passage of goods through a country to their destination” (Free Dictionary, 2019).

⁶ In the remainder of this report, employment refers to formal, private sector employment only.

investigate whether some of these sectors may be better suited to addressing South Africa's unemployment and inequality challenges than others.

Table 3 shows employment in the formal private sector in the IWOSS and non-IWOSS sectors, as well as in individual IWOSS sectors in both 2010 and 2018.⁷

Table 3. Formal private employment in IWOSS and non-IWOSS sectors in South Africa, 2010-2018

	2010	2018	Employment share (%)		Absolute ('000)	Share of change (%)	Annual growth
	('000)	('000)	2010	2018			
Total formal private employment	7,069	8,806	100.0	100.0	1,737	100.0	2.8
Total IWOSS	4,627	5,873	65.5	66.7	1,246	71.8	3.0
Agro-processing	549	593	11.9	10.1	43	3.5	0.9
Horticulture	243	331	5.2	5.6	88	7.1	3.9
Commercial agriculture (excl. horticulture)	146	200	3.2	3.4	54	4.3	4.0
Tourism	669	849	14.5	14.5	180	14.5	3.0
ICT	81	74	1.8	1.3	-7	-0.6	-1.2
Transit trade	332	436	7.2	7.4	104	8.3	3.5
Financial and business services	1,421	2,020	30.7	34.4	599	48.1	4.5
Trade (excl. tourism)	1,185	1,371	25.6	23.3	186	14.9	1.8
Total non-IWOSS	2,442	2,933	34.5	33.3	491	28.2	2.3
Mining	298	406	12.2	13.8	107	21.9	3.9
Manufacturing (excl. agro-processing)	873	851	35.7	29.0	-21	-4.4	-0.3
Utilities	77	124	3.1	4.2	47	9.7	6.2
Construction	525	643	21.5	21.9	118	24.1	2.6
Community, social, and personal services	667	902	27.3	30.7	235	47.8	3.8

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

IWOSS activities account for two-thirds (66.7 percent) of 8.8 million formal private sector jobs in South Africa in 2018, up from 65.5 percent of 7.8 million jobs in 2010. Two sectors account for close to two-thirds of this employment: financial and business services (34.4 percent) and trade (23.3 percent). The share of financial and business services has, however, increased from 30.7 percent, while the share of trade has declined from 25.6 percent. Horticulture and transit trade have also seen increases in their share of IWOSS employment.

The importance of IWOSS sectors is clear when we consider the share of change in formal private employment between 2010 and 2018, with the increase in IWOSS employment accounting for 71.8 percent of the change in employment over the period. All IWOSS sectors have seen an increase in employment apart from information and communication technology (declining at a rate of 1.2 percent per annum). ICT, however, accounts for just 1.3 percent of total IWOSS employment in 2019.

Non-IWOSS sectors account for close to three in 10 new jobs in the formal private employment sector over the period 2010-2018. The dominant contributor to employment growth in these sectors is

⁷ A standardized version of this table is present in the Appendix as Table A1.

community, social, and personal services, which grew at a rate of 3.8 percent per year, and accounts for just under half (47.1 percent) of the increase in non-IWOSS employment over the period. It is, thus, clear that IWOSS sectors have become more important contributors to employment in South Africa between 2010 and 2018, with IWOSS employment increasing at an average annual rate of 3.0 percent per annum, compared to 2.3 percent for non-IWOSS sectors employment.

It is also clear that, within the IWOSS sectors, one sector dominates with respect to the increase in employment, as financial and business services accounts for close to half (48.1 percent) of the increase in employment in the IWOSS sectors, growing at an annual average rate of 4.5 percent. The next fastest-growing sectors in terms of employment are commercial agriculture and horticulture. Employment in these sectors has grown at a rate of 4.0 percent per year. Collectively, these two sectors account for 11.4 percent of the change in total IWOSS employment. Tourism and transit trade have also seen considerable growth: Employment in both grew at a rate in excess of 3 percent per year, accounting for 14.5 and 8.3 percent, respectively, of total IWOSS employment growth over the period. Trade has grown at a relatively lower rate of 1.8 percent per year. However, it still accounts for the second-highest share of the change in total IWOSS employment (14.9 percent) over the period.

Three sectors (financial and business services, tourism, and trade), therefore, account for three-quarters of the growth in employment in the IWOSS sectors, with financial and business services being the major contributor to this growth. However, commercial agriculture, horticulture and transit trade have also seen employment growth greater than the average growth in IWOSS employment, while trade employment has been growing at a rate lower than the overall IWOSS average. These trends suggest that, apart from the dominant financial and business services sector, there may be considerable employment growth potential in the IWOSS sectors of tourism, horticulture, commercial agriculture, and transit trade.

Growth in both male and female employment has been higher in the IWOSS than in the non-IWOSS sectors. For both IWOSS and non-IWOSS sectors, female employment growth has been higher than male employment growth, growing at a rate of 3.5 percent per year (in comparison to 2.7 percent for men) in IWOSS, and at a rate of 2.9 percent per year (in comparison to 2.0 percent for men) in non-IWOSS. Males, however, account for a larger share of the total change in employment in both sectors.

Table 4 shows the change in and composition of employment in IWOSS and non-IWOSS sectors by gender and age. Notably, IWOSS employment is more female-intensive than non-IWOSS employment, with 41.9 percent of employment in the sector accounted for by women in 2018, compared to 33.3 percent in non-IWOSS sectors. The female share of employment has increased in both sectors (up from 40.3 percent in 2010 for the IWOSS sectors, from 31.7 percent for the non-IWOSS sectors).

In 2018, 15- to 24-year-olds accounted for 8.9 percent of employment in IWOSS sectors and 5.4 percent of employment in non-IWOSS sectors. The share of 25- to 34-year-olds in employment is also higher in the IWOSS sectors than the non-IWOSS sectors (33.9 percent in comparison to 29.0 percent). IWOSS sectors, thus, seem to be slightly more intensive in employing youth.

In terms of changes in the profile of employment over time by age, employment of 15- to 24-year-olds has declined in non-IWOSS sectors (at a rate of 0.5 percent per year) and remained virtually unchanged in IWOSS sectors. Employment of 25- to 34-year-olds has, however, increased in both IWOSS and non-IWOSS sectors, with the rate of increase higher in the IWOSS sectors (2 percent per year, in comparison to 1 percent per year for non-IWOSS). The greatest growth in both the IWOSS and non-IWOSS sectors has been for older cohorts, with employment for 35- to 65-year-olds growing at 4.3 percent and 3.5 percent per year for these sectors, respectively.

Table 4. Demographic and educational characteristics of IWOSS and non-IWOSS workers, 2010-2018

	Absolute change 2010-2018		Employment share 2010		Employment share 2018		Ave. annual growth		
	IWOSS	Non-IWOSS	IWOSS	Non-IWOSS	IWOSS	Non-IWOSS	IWOSS	Non-IWOSS	Total
	'000	'000	%	%	%	%	%	%	%
Total	1,246	491	100	100	100	100	3.0	2.3	2.8
By gender									
Male	648	290	59.7	68.3	58.1	66.7	2.7	2.0	2.4
Female	598	201	40.3	31.7	41.9	33.3	3.5	2.9	3.4
By age									
15-24 year olds	4	-31	11.2	7.8	8.9	5.4	0.1	-2.2	-0.5
25-34 year olds	294	63	36.6	32.2	33.9	29.0	2.0	1.0	1.7
35-65 year olds	946	454	51.2	59.0	56.4	64.6	4.3	3.5	4.0
By education									
Less than secondary	277	100	38.8	38.2	35.3	35.2	1.8	1.3	1.6
Secondary complete	653	184	39.7	34.2	42.4	34.8	3.9	2.5	3.5
Post-secondary	323	216	20.4	26.1	21.6	29.1	3.7	3.7	3.7

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

In 2018, 35.3 percent of those employed in the IWOSS sectors had less than secondary education compared to 35.2 percent of those employed in the non-IWOSS. Of those employed in IWOSS, 42.4 percent had completed secondary education compared to 34.8 percent in non-IWOSS. Over three-quarters (77.7 percent) of IWOSS employment is, thus, accounted for by individuals with a secondary or lower level of education in 2018 (down slightly from 78.5 percent in 2010). In non-IWOSS sectors, the share is 70 percent of employment (down from 72.4 percent in 2010).

The IWOSS sectors, thus, seem to be more youth-intensive than non-IWOSS sectors, with youth accounting for a larger share of employment in IWOSS and having higher growth rates in employment. However, total employment of those aged between 15 and 24 has remained virtually unchanged in IWOSS over the period.

IWOSS sectors are also more intensive in employment of individuals with lower levels of education, showing higher growth in employment for the two lower educational attainment groups than non-IWOSS sectors. This trend is suggestive of IWOSS sectors being better suited to absorb low-skilled individuals in South Africa.

Skilled employment accounts for 61.3 percent of IWOSS employment (down from 61.9 percent in 2010) and 64.7 percent of non-IWOSS employment (down from 66.6 percent in 2009). High-skilled employment accounts for 18.5 percent of employment in the IWOSS sectors (down from 19.6 percent in 2010), and 18.4 percent of non-IWOSS employment (down from 18.9 percent in 2010). The profile of employment suggests that IWOSS sectors are more intensive in low-skilled occupations. However low-skilled employment has grown at similar rates in both sectors. The profile also suggests that, while skilled employment accounts for a similar share of employment in both sectors and has seen its share decline in both sectors, the decline in share has been greater in IWOSS sectors. This finding suggests that lower-skilled employment is becoming more important over time in the IWOSS sectors. Furthermore, across all levels of skill, in absolute numbers, increases in employment have been greater in the IWOSS sectors.

Table 5 shows the composition of employment in IWOSS and non-IWOSS sectors by skill level.⁸ Low-skilled employment accounts for just over a fifth (20.3 percent) of all employment in IWOSS sectors, compared to 16.9 percent for non-IWOSS employment. Low-skilled employment is also the fastest-growing occupational category of employment across both the IWOSS and non-IWOSS sectors, growing at an annual average rate of 4.2 percent and 4.3 percent per year, respectively.

Skilled employment accounts for 61.3 percent of IWOSS employment (down from 61.9 percent in 2010) and 64.7 percent of non-IWOSS employment (down from 66.6 percent in 2009). High-skilled employment accounts for 18.5 percent of employment in the IWOSS sectors (down from 19.6 percent in 2010), and 18.4 percent of non-IWOSS employment (down from 18.9 percent in 2010). The profile of employment suggests that IWOSS sectors are more intensive in low-skilled occupations. However low-skilled employment has grown at similar rates in both sectors. The profile also suggests that, while skilled employment accounts for a similar share of employment in both sectors and has seen its share decline in both sectors, the decline in share has been greater in IWOSS sectors. This finding suggests that lower-skilled employment is becoming more important over time in the IWOSS sectors. Furthermore, across all levels of skill, in absolute numbers, increases in employment have been greater in the IWOSS sectors.

Table 5. Occupational structure of IWOSS and non-IWOSS worker, 2010-2018

('000)	Absolute		Share 2010		Share 2018		Ave. annual growth		
	IWOSS	non-IWOSS	IWOSS	non-IWOSS	IWOSS	non-IWOSS	IWOSS	non-IWOSS	Total
	'000	'000	%	%	%	%	%	%	%
Total	1,246	491	100.0	100.0	100.0	100.0	3.0	2.3	2.8
High skilled	180	78	19.6	18.9	18.5	18.4	2.3	2.0	2.2
Skilled	734	271	61.9	66.6	61.3	64.7	2.9	1.9	2.6
Low skilled	332	142	18.6	14.5	20.3	16.9	4.2	4.3	4.2

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

Note: Low-skilled employment refers to employment of Elementary workers. High skilled employment refers to employment of Managers, Professionals and Technicians. Skilled employment refers to employment of workers in all other occupations (Clerks, Craft workers, Operators and Assemblers, Skilled agriculture workers and Service and Sales workers).

Although the gap between the share of low-skilled workers in the IWOSS and non-IWOSS sectors has decreased marginally, IWOSS sectors remain more intensive in low-skilled occupations, and this intensity is increasing over time. While employment opportunities for skilled and high-skilled employment opportunities are also increasing, the shares of these skill categories are shrinking, albeit at a minimal pace. This finding suggests that IWOSS sectors may be better placed than non-IWOSS ones to provide jobs for the low-skilled unemployed in South Africa, while still providing jobs that can accommodate the higher-skilled among the labor force as well.

We have also noted that IWOSS seem to be more female- and youth-intensive in terms of the current composition of employment, suggesting that IWOSS sectors may have the potential to provide greater opportunities for employment for these groups in particular. Importantly, however, the broad IWOSS sectors consists of a number of different sectors, some of which may individually be better placed to provide the type of employment required to address South Africa's widespread unemployment.

Table 6 shows the shares of employment by gender and age in the eight IWOSS sectors in 2010 and 2018. The share of women in IWOSS sectors increased from 40.3 percent in 2010 to 41.9 percent in 2018. In 2018, four sectors in particular have a share of female employment that is higher than the overall IWOSS share of 41.9 percent: tourism (47.9 percent), trade (45.3 percent), agro-processing (45.1 percent), and ICT (43.5 percent). ICT, however, accounts for a very small share of total employment. Two sectors have a share of female employment that is particularly low: commercial

⁸ A standardized version of this table is available in Appendix as Table A2.

agriculture (18.3 percent) and transit trade (21.5 percent). This finding suggests that the former sectors (apart from the tiny ICT sector) may be better suited for targeting female employment creation, while the latter two may not be appropriate for this purpose.

In 2010, approximately one in every 10 workers were youth (11.2 percent of IWOSS sectors), compared to one in every eleven employed in 2018 (8.9 percent). In 2018, five IWOSS sectors have substantially higher than average shares of employment of those aged between 15 and 24 years. These are trade (11.9 percent), horticulture (11.1 percent), tourism (10.9 percent), agro-processing (9.7 percent) and ICT (9.3 percent). In the same period, for 25- to 34-year-olds, the share is highest in the trade (37 percent), tourism (35.9 percent), and financial and business services (33.9 percent) sectors. Combining the two youngest age cohorts, the share of employment of 15- to 34-year-olds is highest for trade (48.9 percent), tourism (46.8 percent) and horticulture (42.9 percent). This suggests that these sectors are most intensive in employment of youth and may have greater potential to absorb the unemployed youth than the other IWOSS sectors.

Table 6. Share of employment by gender and age, IWOSS sectors, 2010-2018

	Share 2010 (%)				Share 2018 (%)			
	Female	15-24	25-34	35-65	Female	15-24	25-34	35-65
Total IWOSS	40.3	11.2	36.6	51.2	41.9	8.9	33.9	56.4
Agro-processing	41.5	8.3	34.0	57.1	45.1	9.7	31.9	58.0
Horticulture	38.2	11.4	39.1	47.9	41.9	11.1	31.8	56.6
Commercial agriculture (excl. horticulture)	25.0	9.9	28.9	59.3	18.3	6.5	31.6	60.2
Tourism	49.2	14.4	39.9	44.6	47.9	10.9	35.9	52.2
ICT	29.2	5.9	37.9	56.2	43.5	9.3	25.9	64.8
Transit	18.4	5.8	29.5	64.1	21.5	4.8	26.5	67.9
Finance	41.6	11.2	37.5	50.1	42.9	6.5	33.9	58.8
Trade (excl. tourism)	42.3	12.7	37.4	49.2	45.3	11.9	37.0	50.1
Non-IWOSS	31.7	7.8	32.2	59.0	33.3	5.4	29.0	64.6
Total	37.3	10.0	35.1	53.9	39.0	7.7	32.3	59.1

Source: Authors' calculations based on Kerr, Lam, and Wittenberg [PALMS] (2019).

In 2018, the lowest share of employment of 15- to 24-year-olds is observed for the transit trade sector (with a 4.8 percent share of 15- to 24-year-olds). In the same period, financial and business services and commercial agriculture also have lower than average shares of employment of those aged between 15 and 24 for IWOSS sectors, with each of these sectors having a share of 6.5 percent. For 25- to 34-year-olds, transit trade is the only sector in which this cohort account for less than 30 percent of all employment (26.5 percent, three percentage points lower than in 2010). In 2018, combining the two youngest age cohorts, the share of employment of 15- to 34-year-olds is lowest for transit trade (31.3 percent), ICT (35.2 percent), and commercial agriculture (38.1 percent). This suggests that these sectors may be the worst suited among the IWOSS sectors to absorb the unemployed youth. The low share of employment of those aged between 15 and 24 in the financial and business services sector also suggests that this sector may not be well suited to provide employment for those aged between 15 and 24 in particular.

The first two of these may be particularly well-suited to absorb employment of those unemployed who have less than secondary education. With respect to the share of individuals who have completed secondary education, in 2018, four sectors again have a share higher than the overall IWOSS average: trade (55.7 percent), tourism (47.8 percent), transit trade (45.8 percent) and information and communication (40.4 percent). As noted, however, ICT accounts for just 1.3 percent of all IWOSS employment.

Table 7 shows the shares of employment in the eight IWOSS sectors by level of education in 2010 and 2018. Given that we are considering the potential of IWOSS sectors to provide employment for the unemployed who, on average, have relatively low levels of educational attainment, sectors that are more intensive in low-skilled occupations that require lower levels of education may be the most suited to absorb the unemployed. With respect to the share of individuals with less than secondary education, four sectors have a share that is higher than the average across all IWOSS sectors in 2018. These are horticulture (82.9 percent), commercial agriculture (74.5 percent), agro-processing (49.5 percent), and tourism (35.8 percent).

The first two of these may be particularly well-suited to absorb employment of those unemployed who have less than secondary education. With respect to the share of individuals who have completed secondary education, in 2018, four sectors again have a share higher than the overall IWOSS average: trade (55.7 percent), tourism (47.8 percent), transit trade (45.8 percent) and information and communication (40.4 percent). As noted, however, ICT accounts for just 1.3 percent of all IWOSS employment.

Table 7. Share of employment by education level, IWOSS sectors, 2010-2018

	Share 2010 (%)			Share 2018 (%)		
	Less than secondary	Secondary complete	Post-secondary	Less than secondary	Secondary complete	Post-secondary
Total IWOSS	38.8	39.7	20.4	35.3	42.4	21.6
Agro-processing	51.2	35.3	11.8	49.5	36.8	13.2
Horticulture	82.5	11.4	5.0	82.9	12.4	3.6
Commercial agriculture (excl. horticulture)	68.3	22.0	9.2	74.5	15.3	9.4
Tourism	37.8	43.5	17.3	35.8	47.8	15.3
ICT	12.5	36.1	50.1	10.2	40.4	48.7
Transit	40.3	38.7	19.1	33.3	45.8	20.1
Finance	27.2	40.3	31.7	25.0	39.6	34.7
Trade (excl. tourism)	36.3	47.4	15.4	28.7	55.7	14.8
Non-IWOSS	38.2	34.2	26.1	35.2	34.8	29.1
Total	38.6	37.8	22.4	35.2	39.8	24.1

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

Note: Some categories do not add up to 100 because of unspecified observations.

The composition of IWOSS employment across demographic, education, and skill characteristics thus reveals that tourism, trade, and agro-processing are most intensive in employing women; trade, tourism, and horticulture are most intensive in employing the youth; and horticulture, commercial agriculture, and agro-processing are most intensive in employing those with the lowest levels of education. At this point, we refer back to our initial discussion of structural transformation in the South African economy, which suggested that South Africa was already on an IWOSS-based growth path, but one that is dominated by growth in the financial and business services sector. Across our disaggregation of the broader IWOSS sectors, in terms of employing women, youth, and the lower-skilled—three groups with the worst employment outcomes in South Africa—the financial and business services sector has not been particularly intensive in employment of these groups.

Table 8 shows the shares of high-skilled, skilled, and low-skilled occupations across the IWOSS sectors, as well as the growth in employment in these occupation levels between 2010 and 2018. In 2018, three sectors had shares of low-skilled employment higher than the IWOSS average.

These are horticulture (80.3 percent), commercial agriculture (62.8 percent), and agro-processing (26.4 percent). This finding is in line with the suggestion from the educational profiles of employment

across the IWOSS sectors, suggesting further that these three sectors in particular have the potential to absorb low-skilled, unemployed youth should these sectors be scaled up. Sectors that do not seem well-suited to absorb low-skilled youth are ICT (which employs a negligible number of low-skilled workers), transit trade (with 12.7 percent of employment being low-skilled), and financial and business services (13.5 percent).

These findings suggest that, while South Africa is already on an IWOSS-based path, there is potential for a different IWOSS-based growth path that may be better suited to addressing South Africa's unemployment. A shift to other IWOSS sectors that are more intensive in their employment of lower-skilled workers may be necessary for realizing the full potential of IWOSS in generating employment. We explore the potential of a number of these specific IWOSS sectors and the skill requirements for these sectors later in this paper.

Table 8. Occupation structure of IWOSS sectors, 2010-2018

	Share 2010 (%)			Share 2018 (%)			Ave. annual growth (%)		
	High-skilled	Skilled	Low-skilled	High-skilled	Skilled	Low-skilled	High-skilled	Skilled	Low-skilled
Total IWOSS	19.6	61.9	18.6	18.5	61.3	20.3	2.3	2.9	4.2
Agro-processing	10.9	68.6	20.5	10.3	63.2	26.4	0.2	-0.1	4.2
Horticulture	4.1	19.1	76.7	3.8	15.9	80.3	2.9	1.6	4.5
Commercial agriculture (excl. horticulture)	9.5	32.7	57.8	8.0	29.2	62.8	1.7	2.5	5.1
Tourism	19.0	66.8	14.2	16.4	69.2	14.4	1.1	3.5	3.2
Information and communications	39.3	58.6	2.1	33.5	64.2	2.3	-3.1	-0.1	-0.1
Transit	21.8	66.8	11.4	20.5	66.8	12.7	2.6	3.5	4.9
Financial and business services	26.8	60.5	12.7	25.7	60.8	13.5	3.9	4.6	5.3
Trade (excl. tourism)	17.5	68.9	13.6	16.2	69.8	14.0	0.9	2.0	2.2

Source: Authors' calculations based on Kerr, Lam and Wittenberg [PALMS] (2019).

Box 1. Women, work, and the economy: The potential role of IWOSS

The pre-1994 South African labor market was characterized by institutionalized racial and gender discrimination (Mosomi, 2019). Job reservation policies guaranteed that whites occupied medium- and high-skilled jobs. A patriarchal culture meant that women were expected to remain at home (Seekings and Nattrass, 2008). However, since 1994, there has been a steady increase of historically under-represented groups in the labor market. Female labor force participation has increased by 6.9 percentage points from 42.7 percent in 1994 to 49.6 percent in 2019 (World Bank, 2020). However, this figure remains 12.9 percentage points below that of the male labor participation rate of 62.5 percent. The female unemployment rate is also approximately 4 percentage points higher than the male unemployment rate (Statistics South Africa, 2020). Finally, women are under-represented in managerial positions across all sectors of the economy (Statistics South Africa, 2018).

Against this background, we consider the potential of IWOSS sectors to increase female participation in the economy. Our findings here suggest that IWOSS sectors employ a higher proportion of females than non-IWOSS sectors (41.9 percent to 33.3 percent in 2018). The

difference in the female employment share between IWOSS and non-IWOSS sectors has remained constant at 8.6 percentage points between 2010 and 2018. Moreover, female employment growth was higher in IWOSS sectors (3.5 percent) than non-IWOSS sectors (2.9 percent). The IWOSS sectors with the highest female employment share are tourism (47.9 percent), trade (45.3 percent), agro-processing (45.1 percent), and ICT (43.5 percent).

Overall, it appears that higher IWOSS growth may have positive effects on female employment and has the potential to contribute to developing a more inclusive economy. IWOSS sectors have a substantially higher proportion of females employed than non-IWOSS sectors. Importantly, the proportion of females employed has continued to grow in IWOSS sectors. This trend looks set to continue, and is not necessarily limited to lower-skilled employment only, as women now comprise the majority of students at South African universities (Naidu, 2018), equipping them with the necessary labor market skills to obtain a number of different jobs. The prospects for inclusive growth seem particularly good in tourism, trade, agro-processing, and ICT.

However, there remains a need to target and improve employment outcomes of women more broadly—not only in the sectors in which they are not currently well-represented. Indeed, much of the female employment in some IWOSS sectors may be linked to the fact that jobs with particular assigned gender roles are likely to be located in these sectors. This trend is particularly the case in the tourism and trade sectors. Throughout this paper, we show that a variety of different employment opportunities, across different value chains, and at different skill levels, may be available through unlocking the potential of IWOSS sectors. It is important that women are supported so that they can access all of these opportunities.

5. Constraints to IWOSS growth

Key to appreciating and realizing the employment potential of any sector is understanding the constraints that currently inhibit its growth. In this section, we first consider the constraints that inhibit growth across all sectors in the economy. We then consider four IWOSS sectors with particular potential for employment growth in more detail in order to understand the constraints that may be inhibiting growth in those sectors specifically.

5.1 Constraints to growth: The broad operating environment for firms in South Africa

Page's (2020) growth constraints framework identifies four broad constraints facing IWOSS: the investment climate, exports, agglomeration, and firm capabilities. Here we outline a number of other overarching constraints that have an impact on the operating environment for firms, and that contribute to constraints in the four broad areas identified by Page (2020), by giving rise to an unfavorable investment climate and limiting: export potential, the benefits of agglomeration, and firm capabilities. We note five particular overarching constraints that impact the operating environment for all firms:

- (i) **Infrastructure.** The World Bank's Investment Climate Assessment shows that more than half of firms in over 50 percent of African countries consider the quality of electricity service a major hurdle to success (Page, 2020). Indeed, South Africa's current electricity crisis poses possibly the biggest constraint to economic growth. Eskom, the country's state-owned electricity utility, has implemented load-shedding—deliberate and planned shutdowns of power in parts of the power distribution system—to varying degrees since 2008 to prevent a complete shutdown of the system. According to Ateba et al. (2019), insufficient and unstable electricity supply has led to increased input costs and difficult

- industrial relations, affecting business enterprise performance and investment plans. Overall, declining electricity sustainability has contributed to the weakness of the country's economic growth (Ateba et al., 2019).
- (ii) **Fiscal pressure.** The proposed 2020 budget adopts a fiscal consolidation plan and suggests cuts to the wage compensation bill and poorly performing programs (National Treasury, 2020). These changes will include decreased spending on infrastructure. For instance, the provincial roads maintenance grant has been reduced by R500 million (\$32 million) in 2020/21, and the education infrastructure grant has also been reduced by equivalent to 4 percent of the grant's baseline in 2020/21, 5 percent in 2020/23, and 5.9 percent in 2022/23 (National Treasury, 2020). Extreme and consistent cuts in infrastructure investments might result in lower capital stock in the long run and, therefore, lower growth (Stupak, 2018).
 - (iii) **Lack of capacity and skills mismatch.** Another reason often cited for South Africa's poor infrastructure delivery is the public sector's lack of capacity and limited technical skills and expertise for infrastructure projects (DBSA, 2019). According to Consulting Engineers SA (Cesa), there is a dire shortage of engineers at a local government level, with only a fifth of municipalities having engineers leading their technical divisions (DBSA, 2019). Lack of capacity acts as a headwind to infrastructure investment in South Africa, contributing to dwindling economic growth.
 - (iv) **Labor market regulation.** According to Borhat and Stanwix (2018), the most frequently cited constraints facing employers and firms are the regulations governing firing, hiring, and other non-wage costs. The study found that South Africa, in comparison to other countries, ranks relatively high in difficulty of firing and hiring employees, and also in rigidity of working hours. (Bhorat and Stanwix, 2018).
 - (v) **Corruption and political interference.** Since 1996, the World Bank's global governance indicators show a steady fall in South Africa's estimate of corruption control and governance effectiveness⁹ (WGI dataset, 2020). The estimate of corruption control declined from 0.73 in 1996 to -0.02 in 2018 (WGI dataset, 2020). In the same period, the estimate of governance effectiveness also declined by 0.68, from 1.02 to 0.34. During the Zuma era,¹⁰ the integrity and effectiveness of state institutions were undermined by political interference (Cilliers & Aucoin, 2016). Corruption and patronage have compromised the strength of many state institutions, leading to a waning international confidence (Cilliers & Aucoin, 2016).

5.2 Constraints to growth in specific IWOSS sectors

Tourism

As the world has become more interconnected, tourism has emerged as one of the pivotal service export sectors for many countries. South Africa, with its multitude of cultural, historical, and scenic sites, is well-placed to take advantage of this rise in demand for tourism (Phiri, 2016). In 2017, 10 million tourists visited South Africa—by far the most in sub-Saharan Africa and second on the continent only to Morocco (11.3 million) (UNWTO, 2019). In 2018, there were an estimated 849 000 formal private sector jobs in tourism,¹¹ representing 5 percent of total employment in South Africa.

In Figure 5, Daly and Gereffi (2017) illustrate the value chain for leisure tourism.¹² The value chain is designed from the perspective of an international tourist and has three main components: consumers

⁹ Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance).

¹⁰ Jacob Zuma was the president of the Republic of South Africa from 9 May 2009, until his resignation on 14 February 2018.

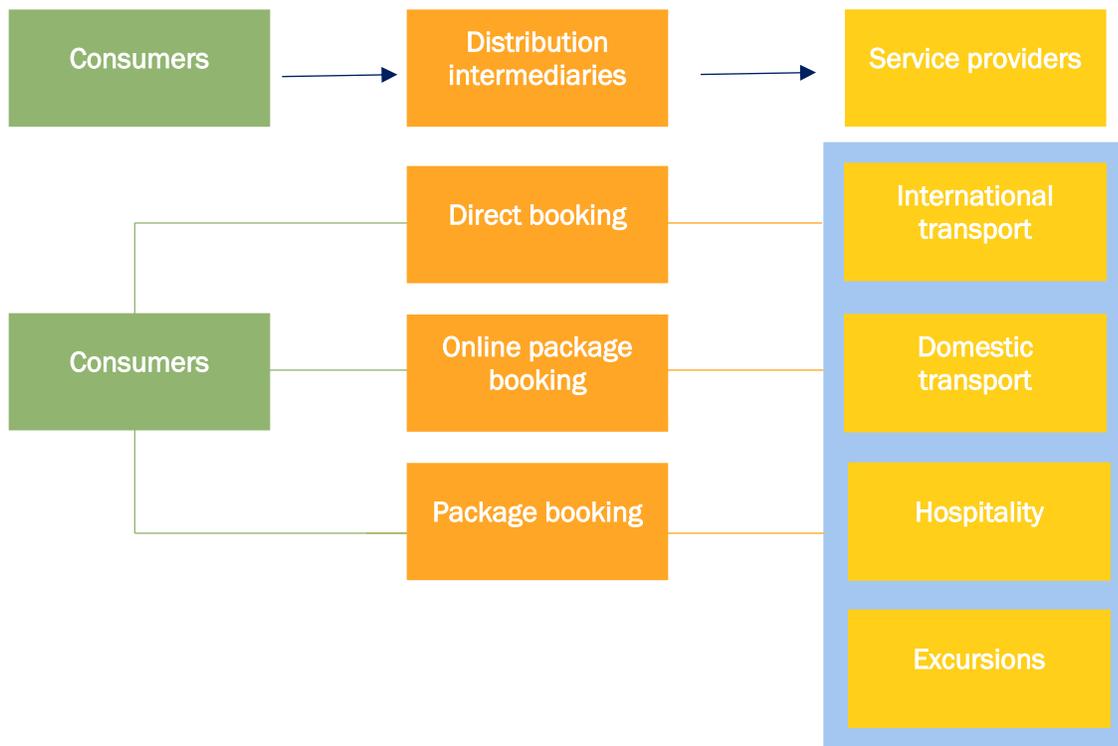
¹¹ Refer to Table 3.

¹² Leisure tourism accounts for 66.0 percent of SA's tourism GDP compared to 34.0 for business tourism (World Travel and Tourism Council, 2020).

(tourists), distribution intermediaries, and service providers. This illustration is intended to be representative at the broadest level: In reality, there is likely to be integration between the “distribution intermediaries” and “service provider” segments of the value chain.

When consumers decide to visit another country, they have three main distribution channels: direct booking, online package booking, and package booking. Direct booking involves consumers that book directly through service provider websites (e.g., South African Airways or Sun International Hotels) and book leisure activities (such as a boat tour) independently. The online package booking distribution channel has experienced the highest growth of the three distribution channels in the past five years (Daly & Gereffi, 2017). Consumers using this channel book a range of services—such as flights, car rentals, hotels, and excursions—on one website such as Expedia or Travelstart. Not only is this method convenient, but consumers can often obtain discounts when purchasing a package of services.

Figure 5: Leisure value chain



Source: Adapted from Daly & Gereffi (2017).

The package booking distribution channels consist of travel agents and global tour operators with a physical presence in a country. A key difference between the online package booking and package booking channels is the latter can sell itinerary-based tour packages, a feature that is difficult to replicate online (Daly & Gereffi, 2017). Furthermore, such businesses can also assist consumers in obtaining visas and relevant permits (e.g., Pentravel) (Daly & Gereffi, 2017).

Table 9 displays some of the most common occupations in the ‘distribution intermediary’ and “service provider” segments of the value chain. These six occupations are low and medium-skilled and thus may present opportunities for employment for low-skilled unemployed youth in the country.

Constraints to realizing the potential of tourism and its associated employment in South Africa can be thought of in terms of the three key agents involved in the value chain: consumers, intermediaries, and service providers. With respect to these components of the value chain, the tourism sector faces a number of challenges which inhibit it from reaching its full potential

Table 9: Common occupations in the leisure tourism value chain

	Position	Skill level
Distribution intermediaries	Inbound tour operator	Low / medium
	Travel agent	Low / medium
Service providers	Airline agents	Medium
	Front office staff	Medium
	Restaurant / bar staff	Low / medium
	Housekeeping	Low / medium

Source: Adapted from Daly and Gereffi (2017).

A number of factors limit the number of consumers of South African tourism (that is, the demand for tourism), including government regulations, perceptions, and ease of access. With respect to the first, in mid-2014, the Department of Home Affairs introduced new visa regulations to reduce child trafficking (Oxford Business Group, 2015). The regulations were onerous in that they required all children under the age of 18 and entering South Africa to have an unabridged birth certificate. In addition, for countries in which a visa is required to enter South Africa, all applicants had to appear in person during the application process to obtain the new biometric visa (Oxford Business Group, 2015).

A further constraint influencing consumer demand is crime (Department of Tourism, 2016a). South Africa has one of the highest crime rates in the world with many instances in the media in which international tourists have been victims of crime. These stories create a negative perception of South Africa as unsafe and, as a result, deter potential international tourists.

In terms of ease of access, the country is far from many key source markets—such as the United Kingdom or Germany—which makes flights expensive. Furthermore, attracting visitors from new countries is made more difficult by the inconvenience of a lack of direct flights (Department of Tourism, 2012a).

Service providers, on the other hand, contend with not only limited consumer demand but factors that limit their ability to fulfill consumer demand. A report noted that approximately 30 percent of employment in the sector¹³ was difficult to fill because the skills requirements were high, with the consequence that these occupational roles were not filled or filled by individuals with insufficient skills (Department of Higher Education and Training, 2019). However, the report did not stipulate which specific skills were in shortage.

While there is potential to develop tourism services where they do not currently exist, a number of obstacles inhibit that growth. Although South Africa has a well-developed tourist market, the focus remains on established tourist hubs such as Cape Town, Durban, the Garden Route, and national parks in the North-West and Mpumalanga provinces, such as the Kruger National Park (Africa Geographic Travel, 2017). At the same time, rural communities have been neglected, despite the many new opportunities they could present to both local and international travelers (Department of Tourism, 2012b). Development of tourist experiences in rural communities could lead to a much-needed cash injection into local, low-income economies, and empower people who have been economically marginalized for decades.

The distribution intermediaries play an important role in connecting the consumers with the service providers, and constraints at this part of the value chain can have an impact on both the demand for and supply of tourism. As noted, however, it does not seem that major constraints to tourism in the country are currently being experienced at this level of the value chain. The online package booking distribution channel, in particular, has grown in recent years (Daly & Gereffi, 2017).

¹³ The sector combined the culture, arts, tourism, hospitality and sports sub-sectors.

Horticulture

Horticulture can be defined as “the cultivation, processing, and sales of fruits, nuts, vegetables, and ornamental plants as well as many additional services” (Shyr and Reily, 2017). According to the Agriculture Research Council (2018), horticultural crops include, *inter alia*, almonds, blueberries, raspberries, kiwi fruit, and cactus pears. Floriculture, a subset of horticulture, is concerned with the cultivation of flowers. In South Africa, the protea is South Africa’s main horticultural export (Netnou-Nkoana & Eloff, 2012). In 2018/19, horticulture contributed 30.3 percent—or R8,312 million—to gross agriculture production, compared to 49.2 and 20.2 percent for the field crops and animal products sub-sectors, respectively (Department of Agriculture, Forestry & Fisheries (DAFF) 2019). According to Bekker (2019), horticulture accounts for one-third of total employment in the South African agriculture sector. Formal private sector employment was 331,000 in horticulture in 2018.¹⁴

Figure 6 shows a generic fresh fruit and vegetable (FFV) value chain (adapted from Sohnen et al., 2015) as an example of a typical horticultural value chain. The value chain has six segments, beginning from the planting of a fruit or vegetable seed through to the purchase of the final product by consumers. Not all activities are undertaken by different agents, with a number of integrated firms involved in many activities along the value chain.

Figure 6. Horticulture: Fresh fruit and vegetable (FFV) value chain



Source: Adapted from Sohnen et al. (2015).

Table 10 shows common occupations along the horticultural value chain. With the exception of the processing segment, there is at least one occupation that is low-skilled in each segment, a finding that suggests that a growing horticultural sector, along with its linkages to other sectors, can provide a number of different employment opportunities for youth (especially low-skilled) in South Africa. Furthermore, occupations that require a higher skill level, such as production supervisors or warehouse managers, are likely to be available to the youth once a certain amount of experience has been gained from the more junior roles. This trend is important as the prospect of career advancement will allow employers to retain employees, who might otherwise look for employment in other sectors.

Other horticultural value chains may also provide further opportunities for employment. For example, in floriculture, the more attractive employment opportunities may be found in the retail segment of the value chain. Although there are no formal entry requirements to become a flower grower, the amount of capital required—to lease land, purchase the correct flowers, etc.—combined with the high-risk that

¹⁴ Refer to Table 3.

comes with being an entrepreneur, means that the youth may not view such a career as attractive at that stage of their lives.

There are indications that this sector will continue to be a source of growth in the future. Sihlobo (2018) showed that, while employment in agriculture halved between the 1960s and 2018, the field crops and horticulture sub-sectors experienced an increase in employment as a result of the increase in area planted. Indeed, two-thirds of agriculture employment in South Africa are now in the field and horticultural sub-sectors, and this share of employment is expected to grow as global demand for food and fibers increase (Sihlobo, 2018). This expected growth is further supported by the increase in horticulture production over the past five years, growing at an average of 7.1 percent per annum. Future forecasts suggest that income from horticulture will be boosted by 40 percent as a result of a growing middle class with higher levels of disposable income (Agriseta, 2018). Further, key export markets, such as the European Union (which accounts for 35 percent of South Africa's deciduous fruit exports) and the Middle East/Asia region, are expected to demand more horticulture products in the future as consumers demand more variety (Agriseta, 2018).

Table 10: Common occupations in the horticulture value chain

	Position	Skill level
Production	Farm worker	Low
	Tractor driver	Medium
	Pest controller	Medium
FFY wholesalers	Storage laborer	Low
Processing	Industrial machinery mechanic	Medium
	Quality controllers	High
	Production supervisors	High
Distribution	Hand packers	Low
	Labelling machine operator	Medium
	Warehouse managers	High
Retail	Cashiers	Low
	Shelf fillers	Low
	Purchasing managers	High

Source: Adapted from Sohnen et al. (2015).

Note: The skill level of an occupation is categorized according to the ISCO-08 classification.

Despite this potential for growth, a number of constraints inhibit expansion of the sector. With respect to inputs in particular, high input costs—especially for seeds and fertilizer—are a constraint for especially smaller-scale producers. There are a variety of seeds for a particular crop and the higher-quality seeds cost more money, which many farmers cannot afford (Harvest SA, 2016). The lack of high-quality seeds ultimately affects the yield of the crops, and the profits of the farmer.

Poor infrastructure is a further constraint faced across the value chain. On the production side, many farmers lack proper farm equipment such as tractors and fences. However, in terms of product distribution, many farmers also do not have easy access to markets, which is crucial in developing a steady supply of customers (Harvest SA, 2016). Indeed, the poor state of road infrastructure in rural areas makes it difficult for farmers to guarantee wholesalers that they will deliver their products on time.

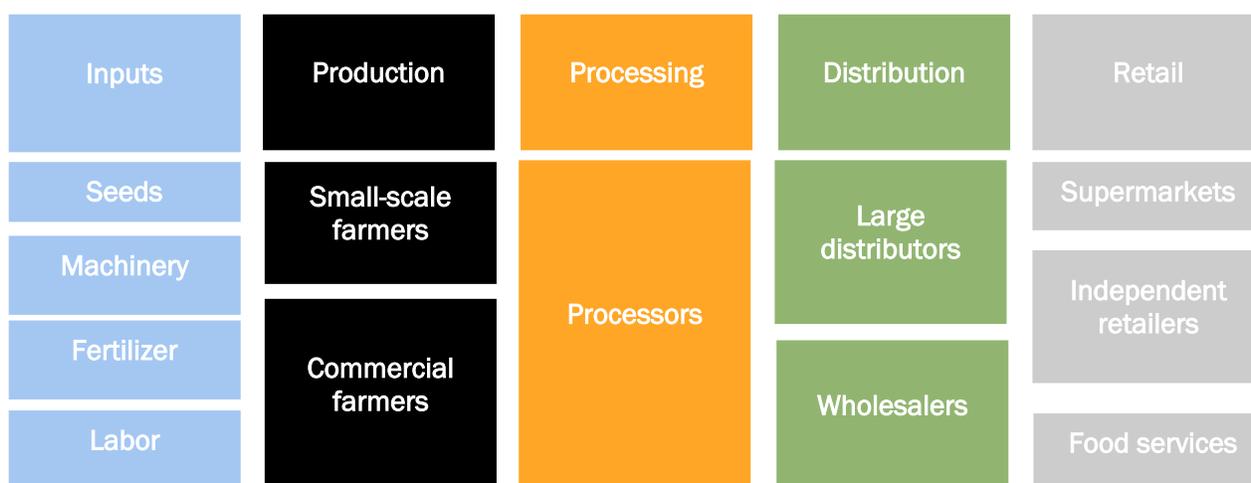
Climate change also remains an ongoing concern for horticulture farmers, as many horticulture crops are rain-fed and therefore susceptible to variations in the climatic conditions of the area (Harvest SA, 2016). In addition, long-term land degradation caused by climate change has made the land less resilient to the changing climatic conditions, exacerbating the effects of droughts (Harvest SA, 2016).

Agriseta (2018) identified a list of “hard-to-fill” vacancies across the horticultural value chain. Employers pinpointed the insufficient number of students with the necessary mathematics and science grades to enter agriculture-related degree programs and a lack of experience among graduates for one set of horticulture occupations. For another set of horticulture occupations, employers noted that certain occupations were not seen as a career path in agriculture (e.g., market researcher), and other industries were regarded as more attractive than agriculture in certain occupations.

Agro-processing

The Food and Agriculture Organization (1997, p. 222) defines the agro-processing sector as ‘the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector.’ The DAFF identified 11 sub-sectors which comprise agro-processing: food, beverages, tobacco, rubber, furniture, footwear, textiles wearing apparel, paper and paper products, wood and wood products, leather and leather products (DAFF, 2018). In 2018, there were 593 000 formal private sector employees in agro-processing, comprising one-third of total employment in manufacturing. In Figure 7 below, we provide a generic value chain through which agricultural products are processed for further distribution and sale. The chain of activities relevant to the sector includes agricultural inputs and production, as well as distribution and retail. Notably, the key value addition of this sector is in the processing segment of the value chain—for example, processing oranges into orange juice.

Figure 7: Agro-processing value chain



Source: Adapted from Dube et al. (2018).

Table 11 shows common occupations in the agro-processing sector. The required skill level of some common agro-processing occupations is higher than that of common occupations noted in tourism and horticulture. However, due to its linkages with other sectors, a thriving agro-processing industry has potential to support low- and medium-skilled employment in other sectors as well. The potential employment impact of agro-processing should thus also be thought of in terms of the types of jobs the sector could contribute to in those sectors as well.

Through its strong upstream and downstream linkages, the agro-processing sector stimulates the agriculture sector by establishing new output markets and boosting farmers’ incomes (Dube et al. 2018). The agro-processing sector exhibits strong linkages by sourcing inputs from a wide variety of sectors, including agriculture, wholesale, and retail and business services. The sector also has strong internal linkages with 13 percent of inputs sourced within the sector itself. In terms of output linkages,

the agro-processing sector sells the majority of its output within the sector. Other big purchasers come from agriculture, forestry and fishing, and catering and accommodation services.

Table 11: Common occupations in the agro-processing sector

	Position	Skill level
Processing	Factory worker	Low
	Canning machine operator	Medium
	Industrial machinery mechanic	Medium

Source: Adapted from Bureau Labour of Statistics (2019).

Note: The skill level of an occupation is categorized according to the ISCO-08 classification.

Due to the sector's ability to stimulate economic activity in multiple industries, the National Development Plan (NDP), which was released in 2011, identified agro-processing and agriculture as critical sectors in delivering inclusive growth in South Africa. Indeed, the NDP estimates that potentially 1 million new job opportunities in this sector could be created by 2030. Since the release of the NDP, government policy documents—including the various iterations of the Industrial Action Policy Programmes, Agricultural Policy Action Plans, and the Presidential 9-point plan—repeatedly note the importance of agro-processing for development.

However, the sector faces a number of constraints that inhibit its potential for growth, particularly with respect to small and medium enterprises in the sector. With respect to inputs, a key constraint is the lack of raw material supply. Firms report challenges in obtaining inputs of sufficient quality and supply (DAFF, 2012). In addition, the high cost and volatility of inputs, such as animal feed, put further pressure on businesses.

The lack of access to capital is another constraint, impeding the ability of firms to expand their operations. Small firms are unable to provide enough collateral for the loans they require (DAFF, 2012). Moreover, banks regard lending to the agro-processing industry as risky, due to the inherent uncertainty of variables such as weather, which can greatly affect the amount of revenue that a firm can be expected to earn.

Lack of skills is another challenge in the agro-processing sector: In 2018, the FoodBev Sector Education and Training Authority analyzed 633 firms in the sector and found that about 43 percent of firms cited a lack of skilled people as the reason they could not fill vacancies, while a further 27 percent cited an inadequate supply of suitable candidates (FoodBev, 2018). Furthermore, firms cited the following skill gaps which existed in the sector: soft skills (e.g., communication, team and interpersonal skills) and managerial skills. The latter skill gap arose because some individuals had earned promotion to managerial positions, however, did not yet have all the requisite skills (FoodBev, 2018).

Firms in the sector also encounter challenges in supplying their goods to the retail market. Stringent regulations and standards are set by the retail market, which constitutes a lucrative source of income for small agro-processing firms. However, many smaller firms cannot meet the standards due to the huge investment required (DAFF, 2012) and so turn to supply the informal sector, which then hinders firm expansion.

Transit trade (logistics)

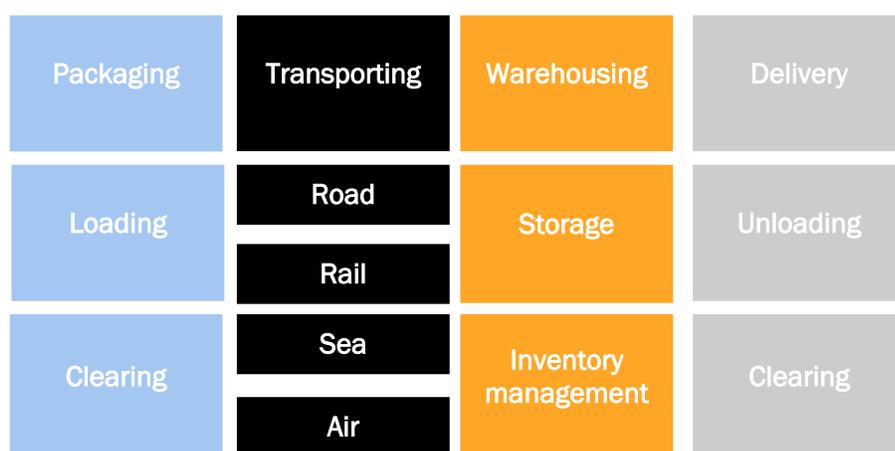
The transport and storage sector contributed 6.4 percent to South Africa's GDP in 2018 (Quantec, 2019). In developed countries, the transport sector's GDP contribution is at the lower end of the range, between 6 and 12 percent of GDP (Department of Transport, 2017). In terms of employment, 436,000

individuals were employed in the sector in 2018,¹⁵ representing 42 percent of employment in the wider transport, storage and communications sector.

The logistics sector in South Africa is comprised of two types of companies: First, there are the conglomerates, such as Imperial Logistics and Barloworld Logistics, which can transport any type of good whether it be vegetables, pharmaceuticals, steel, or cement (Global Africa Network, 2018). Second, there are logistics companies that specialize in transporting particular kinds of goods. For instance, Cargo Carriers transports fuel, steel, chemicals, and gas, while Laser Logistics transports footwear, clothing, and electronic appliances (Global Africa Network, 2018). The logistics industry plays a crucial role in many industries, including agro-processing and horticulture, and thus the full value that logistics provides might not be captured in a single value chain.

Figure 8 illustrates the components of a typical logistics value chain. Goods are first received from a manufacturer and are packaged into the correct container (Erkan, 2014). Once the goods are packaged, they are transported to a warehouse using various modes of transport. In these warehouses, the goods are re-packaged into a suitable format for customers and then are finally delivered to customers, either indirectly through retailers or directly through door-to-door delivery (Erkan, 2014).

Figure 8: Transit trade (logistics) value chain



Source: National Skill Development Corporation (2010).

Table 12 shows common occupations within the value chain. There are multiple opportunities for medium and high-skilled individuals along the value chain. However, for youth without access to post-secondary education, options are somewhat limited, with the best opportunities in the packaging and warehousing segments, in which low-skilled occupations are common.

The logistics industry can be divided into three main constituent parts in South Africa: road, rail and ports/maritime. A key constraint to further development of the sector is the distinct lack of integration across the various logistics sub-sectors in South Africa. Havenga (2011) notes that South Africa has 10 departments or agencies responsible for the country’s logistics system. The number of departments involved create fragmentation, a lack of accountability, and policies inconsistent with each other. Ultimately, the lack of policy coordination creates sub-optimal outcomes for the logistics

¹⁵ Refer to Table 3.

sub-sectors involved. The lack of a national coherent policy framework also undermines the chances of better regional integration with South Africa's neighbors.

Table 12. Common occupations in the logistics value chain

	Position	Skill level
Packaging	Packer	Low
	Quality manager	High
	Packaging engineer	High
Transporting	Truck driver	Medium
	Transportation manager	High
Warehousing	Warehouse assistant	Low
	Forklift operator	Medium
	Warehouse supervisor	High
Delivery	Delivery driver	Medium

Sources: Logistics Training Council (2020), Doyle (2019).

Note: The skill level of an occupation is categorized according to the ISCO-08 classification.

Related to a lack of policy coordination at the national level are two issues: a lack of standardized documentation and no document integration (Barloworld Automotive and Logistics, 2013). Both result in companies having to fill out many different forms and send them to different institutions, increasing the time they have to focus on administration rather than the movement of goods.

A key metric in the logistics industry is efficiency. Specifically, efficiency refers to the speed at which goods can be delivered to the customer. In this value chain especially, any bottlenecks along the way can substantially impact the value of the goods. For example, fruits and vegetables destined for export require certain time targets to be met and, if these targets are not met, retailers will refuse to accept them, costing the farmers and other intermediaries a lot of revenue. Currently, the average loading and off-loading times in South Africa are long, around 4 hours (Barloworld Automotive and Logistics, 2013). Furthermore, cross-border clearance takes between 24-48 hours (Barloworld Automotive and Logistics, 2013).

Given the skills profile of common occupations in the sector, the sector also faces skills constraints. Heyns and Luke (2012), who conducted a survey aimed at determining the skill gaps within the logistics industry, found that, while operational positions were relatively easy to fill, 63 percent of strategic level positions were difficult to fill. Furthermore, respondents were asked to rate the most important skills for logistics managers. Of the top 10 skills, five were behavioral/interpersonal skills (e.g., problem solving, teamwork), three were general management skills (e.g., ability to plan and priorities), and two were logistics sector-specific skills.

6. Trends into the future: A labor force survey-based analysis of potential growth and labor demand of IWOSS

We now consider whether the employment potential of IWOSS sectors can be quantified, as well as what varying estimates of employment potential for IWOSS sectors imply for skill gaps among the youth. While Section 4 emphasized the role of IWOSS sectors in generating employment in South Africa and made suggestions about which IWOSS sectors might be best suited to address youth unemployment in the country based on the employment composition of these sectors, in this section we perform two analyses which consider the potential of IWOSS sectors to address youth unemployment:

- (i) We use the labor to value-added ratio as a measure of labor intensity¹⁶ to calculate a simple projection of IWOSS employment (and therefore the number of new jobs) in the next 10 years on the current growth path; and
- (ii) We adjust these estimates to consider the potential of these sectors to generate jobs and reduce unemployment—especially youth unemployment—should these sectors be scaled up and enabled to grow beyond the current growth path (that is, at a rate greater than the historical growth trend suggests due to constraints in particular IWOSS sectors having been addressed).

For both of these projections, we also note the occupational profile of the projected new IWOSS jobs, and consider whether the skills required for these occupations exist or are likely to exist among the youth. We start our discussion with a consideration of labor-to-value added ratios as a measure of labor intensity. We then use this measure to project IWOSS employment between 2020 and 2028 in the case of the current growth path and then beyond the current growth path.

6.1 Labor-to-value added ratios

Labor-to-value added ratios can be interpreted as the number of jobs that could potentially be created by an additional R1 million increase in output or GVA respectively. The most recent available empirical evidence from South Africa for labor-to-value added ratios is presented in Table 13. While we are unable to calculate IWOSS and formal private sector-specific ratios, we have grouped the broad sectoral classifications into IWOSS and non-IWOSS sectors.

Table 13: Sectoral labor-to-value added ratios at the 1-digit SIC level, 2018

Sector	Labor-to-value added ratio
	2018
Agriculture	11.57
Trade	7.72
Transport	3.66
Financial and business services	3.92
Average	6.72
Mining	1.82
Manufacturing	4.63
Utilities	2.26
Construction	13.78
Community services	7.80
Average	6.06
Average (excluding community services)	5.62

Source: Stats SA (2014, 2019), Kerr, Lam and Wittenberg [PALMS] (2019).

Note: Employment figures by sector are publicly available from official data sources in the form at both the 1-digit and 3-digit SIC level. For the purpose of calculating labor-to-value added ratios, employment data for all quarters of 2018 has been used (PALMS, 2019) in conjunction with the most recent 2018 GVA figures (in 2010 prices) (StatsSA, 2019). The averages are simple averages.

IWOSS dominant sectors are, on average, more labor-intensive than non-IWOSS dominant sectors, with an average labor-to-value added ratio of 6.72 for IWOSS-dominant sectors compared to 6.06 for the others. If “community services,” which includes government employment in these calculations, is excluded, the gap between the averages for the two groups widens. Among the remaining non-IWOSS

¹⁶ Labour intensities are indicative of the labour absorptive capacity of an industry. Paired with projections of output, they can be used to provide a simple projection of employment at a point in the future. We make use of labour-to-value added ratios to project employment in South Africa up to 2028. Labour-to-value-added ratios are the ratio of employment to gross value-added (GVA). A technical explanation of the computation of labour-to-value added ratios is available in Bhorat et al (2020).

dominant sectors, construction is the only one that is considerably more labor-intensive than the IWOSS dominant sectors.

For the manufacturing sector, the labor-to-value added measure indicates that 4.63 jobs are associated with each 1 million rand in value added in the sector. In comparison to manufacturing, two IWOSS dominant sectors are more labor-intensive. The agriculture labor-to-value added ratio of 11.57 is more than double the value for manufacturing. The labor-to-value added ratio for trade is 70 percent higher compared to manufacturing. These numbers suggest not only that IWOSS sectors may have the potential to generate jobs in the place of a declining manufacturing sector; but also that the IWOSS sectors best suited to generate these jobs are those that are agriculture- or trade-based.

For the remainder of this section, we will rely on the labor-to-value added ratios to project employment in IWOSS sectors up to 2028.

6.2 Employment projections and skill gaps

The current growth path

Projection of jobs on the current growth path

This section presents simple projections of new employment in formal, private, non-domestic employment in IWOSS and non-IWOSS, making use of the labor-to-value added ratios presented above.¹⁷ Constant linear growth rates across the nine main sectors at the 1-digit SIC level are applied on the basis of established trends in gross value-added (GVA) in these sectors over 2010-2018.¹⁸ The annualized growth rate is applied to the period 2018-2028¹⁹ to estimate employment in IWOSS and non-IWOSS on the current growth trend. Table A3 in the appendix shows the annualized GVA rates for each sector using this approach, and Table A4 shows the employment growth rates applied to project employment for the IWOSS and non-IWOSS sectors based on these sectoral GVA growth rates.

Table 14 shows the growth patterns of jobs across IWOSS and non-IWOSS sectors from 2019 to 2028 using these projected growth rates. It is immediately clear that, on the current growth path, the majority of employment growth will be concentrated among IWOSS sectors, and that, up to 2028, IWOSS employment growth will consistently account for around 78 percent of total employment growth in South Africa.

South Africa is not on a manufacturing-based growth path, and services—especially financial and business services—are dominant in the country’s current growth path. Indeed, on the current growth path, financial and business services can be expected to account for just over one-third of the increase in total employment over the period. Employment in this sector is expected to grow at an annual average rate of 2 percent over the period, on the basis of historical growth between 2010 and 2018. The sector accounting for the second-highest proportion of new jobs is trade, with approximately one in five new IWOSS jobs being projected to be created in this sector between 2019 and 2028. The three

17 We note two limitations in using this measure to consider employment potential of IWOSS sectors here. The first is that, while the employment data can be disaggregated at the IWOSS level, the GVA data cannot and is only available at the one-digit SIC sectoral level. The second is that we are interested in the employment potential of IWOSS sectors in the formal private sector only. The GVA data can also not be disaggregated at this level. In this regard, bearing the limitations in mind, individual IWOSS sub-sector estimates are obtained by multiplying sectoral labor-to-value added ratios by the projected GVA for the period for the nine main sectors at the 1-digit SIC level and then allocating these new jobs for each main sector to each IWOSS. This is done using the proportion of employment in each main sector which can be attributed to an individual IWOSS. This ratio is based on employment data for all quarters of 2018 and assumed to be constant for the forecasting period. This is a shortcoming of this approach as the evidence thus far suggests that IWOSS’s share of total employment will increase in the foreseeable future.

18 Given that this was a particularly poor period for economic growth across most sectors in the country, it may be that projections based on these rates may not represent the growth potential of the sectors. In the next section, we consider what different assumptions about the growth potential of the economy and particular sectors in the economy will have on the results obtained here on the basis of current growth trends in the economy.

19 The base year is 2018, as this is the latest year that we have GVA data and all Quarterly Labour Force Survey data for the entire year.

largest sectors in IWOSS (financial and business services, trade, and tourism) collectively, then, are expected to contribute 61.5 percent of all new jobs in South Africa over the period. In contrast, non-IWOSS employment growth is only expected to account for 22.6 percent of all new jobs between 2019 and 2020, with community, social and personal services projected to be the dominant driver of the increase in employment in the non-IWOSS sector.

Overall, the evidence suggests that South Africa is already on an IWOSS-intensive growth path., The IWOSS sectors most intensive in the employment of low-skilled workers are horticulture, agriculture, and agro-processing. Collectively, these sectors are projected to account for just 11.1 percent of the increase in IWOSS employment between 2019 and 2028 on the current growth path. Thus, while IWOSS seems to be the major driver of future employment growth the subsectors driving current IWOSS growth are not those best suited for the employment of the low-skilled and youth. The current growth path will be unable to generate future jobs at the scale and skill level required for the country's labor force.

Table 14. New jobs in IWOSS and non-IWOSS, 2019-2028, current trends in growth

	Employment level ('000s)			Share of change (%)		
	2019	2023	2028	2019-2023	2023-2028	2019-2028
IWOSS	5,979	6,426	7,033	77.19	77.53	77.39
Agro-processing	598	618	645	3.53	3.38	3.45
Horticulture	335	354	379	3.24	3.18	3.21
Other agriculture	203	214	229	1.96	1.92	1.94
Tourism	864	927	1,012	10.82	10.79	10.80
ICT	76	82	90	1.05	1.06	1.06
Transit trade	444	480	529	6.19	6.22	6.21
Finance	2,066	2,259	2,527	33.47	34.13	33.85
Trade	1,394	1,492	1,624	16.92	16.84	16.87
Non-IWOSS	2,965	3,097	3,273	22.81	22.47	22.61
Mining	406	406	406	0.02	0.02	0.02
Other manufacturing	858	888	926	5.08	4.86	4.95
Utilities	124	122	120	-0.28	-0.26	-0.27
Construction	652	687	735	6.20	6.07	6.12
Community services	925	993	1,085	11.79	11.78	11.79
Total	8,944	9,522	10,306	100.00	100.00	100.00

Source: Authors' calculations based on projections using Kerr, Lam and Wittenberg [PALMS] (2019) and StatsSA (2019).

Occupational distribution of new jobs on the current growth path

We proceed now to consider the skills profile of these new jobs on the basis of the most recently available skills profile of employment across sectors in South Africa.^{20, 21} In Table 15, we present both

20 This is based on an average of the shares of employment for each occupational and education group across all quarters of 2018. Here, we make an assumption that the occupational employment profile in the different sectors will remain constant over time. In reality, however, it is likely that in many of these sectors skill requirements will become higher. Therefore, any skill requirements and gaps estimated here should be interpreted as a lower bound. That is, the skill requirements for many sectors may be higher in the future, and thus an estimate based on the current occupational distribution of employment may be an under-estimate of the skill requirements, and consequently, the skill gap calculated in the next section.

21 The methodology is further detailed in Borat et al. (2020).

the numbers of individuals in different occupations and the number of individuals of different levels of education required for the new jobs projected in the years 2019, 2024, and 2028.

Between 2019 and 2028, we project that just over 1 million new jobs will be created in IWOSS. Of these new jobs, around one in five (21.4 percent) are projected to be created for service, shop, and market sales occupations, while another 18.1 percent are projected to be created for elementary occupations. These two occupations are followed by clerks (17.6 percent of new jobs) and managers and senior officials (14.3 percent). These four occupational categories account, therefore, for just over 70 percent of all jobs projected to be created on the current growth path during that time period. Only one of these (elementary occupations), however, is a low-skilled occupation. Other lower-skilled occupations (craft workers, plant and machine operators, and assemblers) account for 13.5 percent of the projected new jobs collectively. Around one in three new jobs (31.6 percent) are thus expected to be created in the three lowest-skilled occupational categories.

Table 15. Occupational and educational distribution of projected new jobs in IWOSS sectors, 2019-2028

	Employment level ('000s)			Share of change (%)		
	2019	2024	2028	2019-2024	2024-2028	2019-2028
Occupation						
Legislators, senior officials, and managers	823	904	974	14.26	14.28	14.27
Professionals	289	321	350	5.75	5.82	5.78
Technical and associate professionals	480	530	574	8.87	8.94	8.90
Clerks	1,017	1,116	1,203	17.60	17.62	17.61
Service workers, shop, and market sales workers	1,184	1,304	1,409	21.37	21.44	21.40
Skilled agricultural and fishery workers	33	36	38	0.42	0.41	0.42
Craft and related trades workers	415	450	480	6.21	6.17	6.19
Plant and machine operators and assemblers	528	569	605	7.34	7.27	7.31
Elementary occupations ²²	1,210	1,312	1,401	18.17	18.05	18.11
Total	5,979	6,543	7,033	100.00	100.00	100.00
Level of education required						
Pre-secondary	475	511	541	6.30	6.18	6.24
Secondary	3,469	3,790	4,069	56.99	56.92	56.96
Post-secondary	722	793	854	12.50	12.53	12.51
University degree	1,168	1,289	1,395	21.46	21.60	21.53
Post-graduate degree	145	160	174	2.74	2.77	2.76
Total	5,979	6,543	7,033	100.00	100.00	100.00

Source: Authors' calculations based on projections using Kerr, Lam, and Wittenberg [PALMS] (2019) and StatsSA (2019).

Looking at the education profile, it is projected that over half of all of the new jobs (57 percent) will require a completed secondary education, while 36.8 percent will require a post-secondary education. Just 6.2 percent of the new jobs will require individuals with less than completed secondary education, which is concerning, given that this group still accounts for a large proportion of the current unemployed as well as those entering the labor force each year.

²² "Elementary occupations consist of simple and routine tasks which mainly require the use of hand-held tools and often some physical effort." (International Labor Organization, 2020).

Skill gaps²³ on the current growth path

Table 16 shows the difference between the number of jobs required in each education category in 2028, and the number of youth that fall into these categories in the same year. Of course, the gap (or surplus) does not take into account that the stock of supply here (the youth) is not the only pool from which employment for IWOSS will be drawn. It also does not take into account that the youth will be employed in non-IWOSS sectors as well. It should thus be interpreted as an indicator of whether the skills required can be drawn from the youth population alone, while bearing in mind that in reality it will not be the case that all skill requirements will come from not only the youth population, and the youth population's skills will not serve the skills requirement needs of the IWOSS sectors only.

The table shows that, on the current growth path, the skills required for new jobs will be available in the youth labor force in 2028. In fact, there will be a surplus of available skills at all education levels, with this surplus decreasing considerably from over 1 million individuals for both pre-secondary and completed secondary, to just 33,900 for post-graduate as the education level increases.

Table 16. Sectoral skill gap for IWOSS with respect to the youth, 2028

<i>Thousands</i>	Pre-secondary	Secondary complete	Post-secondary	University degree	Post-graduate
Labor supply (youth labor force)	1,281.8	1,262.0	138.41	93.0	37.4
Labor demand	7.8	71.8	15.8	27.3	3.5
Legislators, senior officials, and managers	-	1.6	1.6	12.9	1.9
Professionals	-	-	0.1	5.7	1.6
Technical and associate professionals	-	0.5	2.2	8.6	-
Clerks	-	13.7	8.4	0.2	-
Service workers, shop, and market sales	0.1	26.4	0.6	-	-
Skilled agricultural and fishery workers	0.0	0.2	0.3	-	-
Craft and related trades workers	0.8	4.4	2.6	-	-
Plant and machine operators and assemblers	0.0	9.1	0.1	-	-
Elementary occupations	6.9	15.9	0.0	-	-
Sectoral skill gap	1,274.0	1,190.2	122.6	65.7	33.9
Sectoral skill requirement availability ratio	165.3	17.6	8.7	3.4	10.7

Source: Authors' calculations based on projections using Kerr, Lam and Wittenberg [PALMS] (2019), United Nations (2019) and Stats SA (2019).

The skill availability ratio in Table 16 measures the extent to which the skill requirements exist in the target population (in this case, the youth)—in short, it is the number of individuals required at each particular level of education to the number of individuals available. It serves to provide an indication of whether it is possible that the skills required could be drawn from the youth population at a particular point in time. High skills availability ratios suggest that the skills required can be found in the pool of youth labor, but it also suggests that there are not enough jobs to provide employment for all individuals seeking employment.

For those with less than secondary education, we calculate the skills availability ratio in 2028 to be 165.3, reflecting a surplus of individuals with this level of educational attainment. While this is not as high as the ratio for the previous category, the ratio for completed secondary is 17.6, suggesting that

²³ A technical explanation for the estimation of skill gaps is available in Borat et al (2020).

new IWOSS jobs that require this level of education could be sourced from the youth population. The availability ratio dips to 8.7 for post-secondary non-degree education, suggesting that there may be challenges in obtaining youth specifically with this education level to fill the new IWOSS jobs at this level.

Notably, the ratio is under five for a university degree (3.4), suggesting that it would be unlikely for jobs with this requirement to be filled by the youth. Furthermore, both IWOSS and non-IWOSS sectors will employ the youth, implying a smaller skills availability ratio than estimated in Table 16.

The next section considers how employment numbers and skill gaps can be expected to change should potential in IWOSS sectors be realized.

Beyond the current growth path

In this section, we project employment using the same methodology used in section 6.1, but instead apply a higher rate of job creation across four selected IWOSS sectors with the potential to create jobs across the skills spectrum in South Africa. The exercise makes no judgment about the precise potential of these sectors to provide employment opportunities, but serves to illustrate the potential impact of increased growth of the IWOSS sectors under consideration on the creation of employment opportunities for the youth.

In the previous section, we presented simple projections of new employment in IWOSS and non-IWOSS sectors, by applying constant linear GVA growth rates. In this section we apply higher growth rates for the four IWOSS sectors of horticulture, agro-processing, tourism, and transit trade.²⁴

Since growth will require gradual policy and implementation reforms, the projection considers three distinct periods over 2019-2028. These are: (i) a period in which the employment growth rate first remains on the current growth trajectory (2019 to 2021); (ii) a period in which the employment growth rate increases by a constant proportion every year until the employment growth rate reaches a new higher potential growth rate (2022 to 2026); and (iii) a period where growth continues on the new growth path which has been reached (2027 onwards).²⁵

Furthermore, to illustrate the impact of prioritizing sectors that seem to have the greatest potential, we apply a higher potential employment growth rate to two IWOSS sectors (tourism and horticulture) that we believe have the greatest potential for employment creation for youth (based on our preceding analysis). Table 17 shows the employment growth rates that are applied to project IWOSS employment on this path.

Table 18 shows the growth patterns of jobs across IWOSS and non-IWOSS sectors from 2019 to 2028. Under this higher growth path scenario, IWOSS employment growth will account for 79 percent of total employment growth between 2019 and 2023, and 84 percent of total employment growth between 2023 and 2028. For the overarching period 2019-2028, then, IWOSS employment growth will account for around 82 percent of total employment growth in South Africa, with this share increasing as growth increases in the four selected IWOSS sectors.

²⁴ While the previous section made use of GVA growth rates to project employment, in this section we make use of the employment growth rates implied by the GVA growth rates we used before as a basis for the analysis. This is because we are unable to apply a sector-specific GVA growth rate to the IWOSS sectors, as we do not have access to sector-level GVA data. This essentially means that the new growth path projections scale up the employment creation projections of the previous section for the four IWOSS sectors according to the new growth path scenario laid out here.

²⁵ The analysis does not take external growth shocks into consideration such as a global financial crisis.

Table 17. Employment growth in IWOSS sectors under a higher IWOSS growth path scenario, 2019-2028

	2019-2021	2022	2023	2024	2025	2026-2028
IWOSS						
Agro-processing	0.84	1.01	1.18	1.35	1.52	1.69
Horticulture	1.37	1.92	2.47	3.02	3.56	4.11
Other commercial agriculture	1.37	1.37	1.37	1.37	1.37	1.37
Tourism	1.76	2.47	3.17	3.88	4.58	5.28
ICT	1.96	1.96	1.96	1.96	1.96	1.96
Transit trade	1.96	2.35	2.74	3.13	3.52	3.91
Finance	2.26	2.26	2.26	2.26	2.26	2.26
Trade	1.71	1.71	1.71	1.71	1.71	1.71

Source: Authors' calculations using Kerr, Lam and Wittenberg [PALMS] (2019) and StatsSA (2019).

Table 18. Employment in IWOSS and non-IWOSS, 2019-2028, higher growth path

	Employment level ('000s)			Share of change (%)		
	2019	2023	2028	2019-2023	2023-2028	2019-2028
IWOSS	5,979	6,461	7,358	78.50	83.59	81.74
Agro-processing	598	623	674	4.04	4.75	4.49
Horticulture	335	360	433	4.02	6.84	5.81
Other commercial agriculture	203	214	229	1.77	1.40	1.54
Tourism	864	946	1,200	13.40	23.62	19.90
ICT	76	82	90	0.92	0.77	0.83
Transit trade	444	485	581	6.74	8.95	8.14
Finance	2,066	2,259	2,527	31.50	24.94	27.33
Trade	1,394	1,492	1,624	15.96	12.31	13.64
Non-IWOSS	2,965	3,097	3,273	21.50	16.41	18.26
Mining	406	406	406	0.00	0.00	0.00
Other manufacturing	858	888	926	4.89	3.54	4.03
Utilities	124	122	120	-0.33	-0.19	-0.24
Construction	652	687	735	5.70	4.47	4.92
Community services	925	993	1,085	11.07	8.58	9.49
Total	8,944	9,558	10,631	100.00	100.00	100.00

Source: Authors' calculations based on projections using Kerr, Lam and Wittenberg [PALMS] (2019) and StatsSA (2019).

On this higher growth path, financial and business services—the current dominant sector in the South African economy—can be expected to account for 27 percent of the increase in total employment over the period, with this share declining from just under a third (32 percent) for 2019-2023, to 25 percent for 2023-2028. At the same time, tourism is expected to increase its share of the change in total employment from 13 percent for the 2019-2023 period, to 24 percent for the 2023-2028 period (averaging 20 percent for the full 2019-2028 period). Thus, by 2028, under this scenario, tourism attains a level of job creation on par with financial and business services. Tourism, unlike financial and business services, is not concentrated in one services sector of the economy.²⁶ Thus, expansion

26 While all financial and business services employment can be found in one services sector, tourism employment is found in multiple services sectors including trade, community services, and financial and business services. The type of skills required in these services sectors is typically lower than the type of skills required in the financial and business services sector.

of the tourism sector can be expected to have more inclusive growth outcomes and stimulate growth in other sectors of the economy that are linked to tourism.

Horticulture is also expected to increase its share of the total change in employment considerably from 4 percent in the 2019-2023 period to 7 percent in the 2023-2028 period (averaging 6 percent for the full 2019-2028 period). In comparison to the current growth path, this higher share of horticulture in the change in employment suggests a more balanced IWOSS-based growth path under the higher growth path scenario, where growth in employment in the skills-biased financial and business services sector is complemented by growth in more inclusive sectors such as tourism and horticulture.

We now consider the skills profile of these new jobs on the basis of the most recently available skills profile of employment across sectors in South Africa.²⁷ In Table 19, we present both the numbers of individuals in different occupations and the number of individuals of different levels of education required for the new jobs projected in the years 2019, 2024, and 2028 for the new growth path scenario.

Table 19. Occupational and educational distribution of projected new jobs in IWOSS sectors on a higher IWOSS growth path, 2019-2028

	Employment level ('000s)			Share of change (%)		
	2019	2024	2028	2019-2024	2024-2028	2019-2028
Occupation						
Legislators, senior officials, and managers	823	913	1016	14.12	13.90	14.00
Professionals	289	322	355	5.28	4.37	4.79
Technical and associate professionals	480	533	588	8.36	7.33	7.80
Clerks	1,017	1,127	1,251	17.26	16.66	16.94
Service workers, shop, and market sales workers	1,184	1,319	1,483	21.43	21.90	21.69
Skilled agricultural and fishery workers	33	36	40	0.44	0.48	0.46
Craft and related trades workers	415	453	495	6.07	5.64	5.84
Plant and machine operators and assemblers	528	578	644	7.92	8.85	8.42
Elementary occupations	1,210	1,331	1,486	19.11	20.86	20.06
Total	5,979	6,613	7,358	100.00	100.00	100.00
Level of education required						
Pre-secondary	475	522	592	7.34	9.45	8.48
Secondary	3,469	3,835	4,276	57.74	59.25	58.56
Post-secondary	722	800	890	12.33	12.01	12.16
University degree	1,168	1,295	1,422	20.01	17.09	18.43
Post-graduate degree	145	161	178	2.57	2.21	2.38
Total	5,979	6,613	7,358	100.00	100.00	100.00

Source: Authors' calculations based on projections using Kerr, Lam and Wittenberg [PALMS] (2019), United Nations (2019) and StatsSA (2019).

27 As noted above, this is based on an average of the shares of employment for each occupational and education group across all quarters of 2018. Here, we make an assumption that the occupational employment profile in the different sectors will remain constant over time. In reality, however, it is likely that in many of these sectors skill requirements will become higher. Therefore, any skill requirements and gaps estimated here should be interpreted as a lower bound. In other words, the skill requirements for many sectors may be higher in the future, and thus an estimate based on the current occupational distribution of employment may be an underestimate of skill requirements and, consequently, the skills gap calculated in the next section.

Between 2019 and 2028, we project that around 1.4 million new jobs will be created in IWOSS. Under the current growth path, this number was estimated at just over 1 million. Of these new jobs, around one in five (21.7 percent) is projected to be created for service occupations, while another one in five (20 percent) is projected to be created for elementary occupations. These two occupations are followed by clerks (16.9 percent of new jobs) and managers and senior officials (14 percent). These four occupational categories account, therefore, for 72.6 percent of all jobs projected to be created over the period on this growth path. Compared to the current growth path, the share of jobs expected to be elementary is higher (20 percent, compared to 18 percent for the current growth path). Just over a third of all new jobs (34.3 percent) are expected to be created in the three lowest-skilled occupational categories.

Looking at the education profile, it is projected that over half of all of the new jobs (58.6 percent, higher than the share of 57 percent for the current growth path) will require a completed secondary education, while a third will require a post-secondary education (lower than the share of 36.8 percent for the current growth path). Around 8 percent of the new jobs will require individuals with a less-than-complete secondary education, higher than the 6.2 percent share of new jobs for this group of individuals on the current growth path. Thus, a greater share, and number, of jobs that can be accessed by individuals who do not have high levels of educational attainment under the new growth path scenario will emerge.

Table 20 shows the difference between the number of jobs required in each education category in 2028 and the number of youth that fall into these categories in the same year. As noted above, the gap (or surplus) does not take into account that the stock of supply here (the youth) is not the only pool from which employment for IWOSS will be drawn. It also does not take into account the fact that the youth will be employed in non-IWOSS sectors as well. Thus, the indicator only specifies whether the skills required are available within the youth population.

Table 20. Sectoral skill gap for IWOSS with respect to the youth, 2028

<i>Thousands</i>	Pre-secondary	Secondary complete	Post-secondary	University degree	Post-graduate
Labor supply (youth labor force)	1,281.8	1,262.0	138.41	93.0	37.4
Labor demand	19.1	117.9	23.8	33.3	4.3
Legislators, senior officials, and managers	-	4.3	4.0	16.7	2.5
Professionals	-	-	0.2	6.5	1.9
Technical and associate professionals	-	1.3	3.1	9.9	-
Clerks	-	21.7	11.1	0.2	-
Service workers, shop, and market sales	0.1	42.4	1.2	-	-
Skilled agricultural and fishery workers	0.0	0.3	0.6	-	-
Craft and related trades workers	1.8	6.0	3.3	-	-
Plant and machine operators and assemblers	0.1	17.5	0.1	-	-
Elementary occupations	17.1	24.5	0.0	-	-
Sectoral skill gap	1,262.75	1,144.05	114.65	59.67	33.11
Sectoral skill requirement availability ratio	67.2	10.7	5.8	2.8	8.6

Source: Authors' calculations based on projections using Kerr, Lam and Wittenberg [PALMS] (2019), United Nations (2019) and StatsSA (2019).

The table shows that, in 2028, overall, the skills required for the new jobs on the new growth path will be available in the youth labor force. There is a surplus of available skills at all education levels, with this surplus decreasing considerably from over 1 million individuals for both pre-secondary and completed secondary to just 33,100 for post-graduate as the education level increases. Given the greater demand for labor, the surplus is lower than under the current growth path case.

As in the above scenario, the skill availability ratio measures the extent to which the skill requirements exist in the target population (in this case, the youth). For those with less than secondary education, we calculate the ratio in 2028 to be 67.2 (less than the ratio of 165.3 for the current growth case), again reflecting a surplus of individuals with this level of educational attainment, but not as acute as the current growth path. The ratio is 10.7 for completed secondary (compared to 17.6 for the current growth path)—again not as high as the ratio for the previous category, but still suggestive that new IWOSS jobs that require this level of education could be filled by the youth population.

The availability ratio dips to 5.8 (compared to 8.7 for the current growth path) for post-secondary non-degree education, suggesting that there may be considerable challenges in finding youth specifically with this education level to fill the relevant new IWOSS jobs. The ratio is under 5 for degree (2.8, not considerably different from 3.4 for the current growth path) but increases again to 8.6 (lower than 10.7 for the current growth path) for post-graduate education. The low ratio for university degree holders particularly suggests that it would be unlikely for jobs with this requirement to be filled by the youth. Under the high growth scenario, there is increased strain on the higher-skilled occupations required to support higher growth.

These projected numbers suggest that, while increased employment opportunities may arise from overcoming sector-specific constraints, the accessibility of such opportunities depends on the availability of suitable skills. In comparison to the current growth scenario, there remains a surplus of individuals in the labor force in the higher growth scenario. However, in terms of skill requirements, there is likely to be a low proportion of youth who can take advantage of employment opportunities in higher-skilled occupations. In contrast, there will be a sufficient supply of youth for lower skilled job opportunities.

7. Firm survey results

This section supplements the above analysis by using the findings of interviews conducted with 18 firms across the four chosen IWOSS sectors. The approach is case study-based and aimed at generating relevant insights applicable to a broad spectrum of firms within these four sectors. These results should not be seen as representative of all firms in the sectors under consideration.

The results presented are a first consideration of the occupations that youth tend to be employed in; whether there are any potential business expansion plans that may result in increased youth employment in the future; and the current gaps in skills among the youth. These surveys only capture information on youth who are currently employed, meaning that skill gaps among the youth population will likely be underestimated due to the absence of information on those individuals who are unemployed.²⁸

This section proceeds as follows: It first provides an overview of the approach, the firms interviewed, and the questionnaire used to guide the interviews. It then proceeds to consider the results of the surveys across the different sectors.

²⁸ The skill gap is likely to be underestimated rather than overestimated since employed youth are likely to have higher skill attainment levels than their unemployed counterparts, thus allowing them to obtain a job in the first place.

7.1 Approach

In Section 6, we used labor force survey data to provide projections of employment for various IWOSS sectors and provide estimates of skill gaps in the youth population in line with these projections. Although this method can provide informative insights, it does have a number of disadvantages: Primarily, the quantitative approach undertaken relies on historical data, which are limited in their scope for explaining future trends in employment and skills. Furthermore, the use of education as a proxy for skills is problematic as educational attainment is only loosely linked to skills used on the job, as well as being an inconsistent measure across countries (Green, 2006). Within South Africa, educational quality is heterogenous, which raises concerns about whether a year's worth of education is comparable across educational institutions.

To address these shortcomings, we conducted firm surveys that allow for deeper insight into skill profiles than is available through labor force surveys. For example, firm surveys can provide data regarding soft skills²⁹ and hard skills³⁰ generally available from a labor force survey. Where appropriate, these surveys were also used to gauge the potential for employment growth in different IWOSS sectors in South Africa.

In total, 18 semi-structured firm interviews were conducted (Table 21). Fifty percent of interviews were conducted in the tourism sector, while the remaining 50 percent were split equally across the agro-processing, horticulture, and logistics sectors. The greater number of interviews in the tourism sector was driven by a number of factors, including the diverse range of activities within the sector; the large number of linkages that tourism has to other sectors; the size of the tourism industry in comparison to the other three sectors; and the high proportion of youth involved in the sector (see Bhorat *et al.*, 2016).

Table 21. Interviews by sector

Sector	No. of interviews
Agro-processing	3 firms
Horticulture	3 firms
Tourism	9 firms
Logistics	3 firms

The survey instrument used to conduct the interviews—comprised a mixture of closed-ended and open-ended questions—aims to provide measures of the following factors, among others: the main occupations within the firm; the current skills profile of the firm; the expansion plans of the firm; and the future employment, occupational, and skills needs of the firm.

In order to obtain a comparable measure of skill level, formal education requirement is used as a preliminary proxy for level of skill. Although flawed, the use of a formal education requirement as a proxy for skill would—if the interviews were truly representative—allow for these results to be mapped to labor force survey data in order to compute skill gaps according to the method adopted in Section 6 of this paper.

Beyond formal educational attainment, however, it is also prudent to understand occupational skills requirements, which can act as an input to the development of a national skills development strategy. Respondents were asked about the occupational requirements for a highly disaggregated list of soft and hard skills, including, among others, mathematics, active learning, troubleshooting, and

29 'Non-technical and not reliant on abstract reasoning, involving interpersonal and intrapersonal abilities to facilitate mastered performance in particular context' (Hurrell, Scholaris & Thompson, 2012: 162).

30 'The abilities to perform a certain type of task or activity' (Cimatti, 2016: 97).

persuasion. The various skills are aggregated into six overarching categories, which are consistent with classifications provided by O*NET (2019b). We also classify these categories according to whether they are a “hard” or “soft” skill.

- Basic skills: skills that facilitate learning or the more rapid acquisition of knowledge (*soft skill*).
- Social skills: skills that are used to work with people to achieve goals (*soft skill*).
- Problem-solving skills: skills that are used to solve novel, ill-defined problems in real-world settings (*soft skill*).
- Resource management skills: skills that are used to allocate resources efficiently (*soft skill*).
- Technical skills: skills that are used to design, set up, operate, and correct malfunctions involving application of machines or technological systems (*hard skill*).
- Systems skills: skills that are used to understand, monitor, and improve socio-technical systems (*hard skill*).

Consistent with metrics used in the O*NET database (O*NET, 2019a), respondents were asked to classify each skill in the above categories according to two metrics: level and importance. The level of a skill refers to how complex the application of the skill is in the occupation’s daily course of events.³¹ A skill’s level was measured on a scale ranging from 1 (lowest) to 5 (highest). On the other hand, importance of a skill can be thought of as how critical it is that an individual has this skill in order to complete their day to day tasks. Importance was also measured on a scale of 1 (not important) to 5 (critically important).³²

Importantly, all respondents interviewed were either human resource managers or floor managers directly supervising the operations of the business. Thus, they can reasonably be assumed to have an adequate understanding of the skill requirements of each of the identified occupations. Despite this, an important caveat regarding these responses is that they only reflect the opinion of one person in the firm. There is, therefore, a degree of subjective bias present in these results. Nonetheless, the results provide an indication of the perceptions of managers in the firms with regard to the skill requirements for identified occupations.

Finally, respondents were asked to estimate the severity of the skill gap of youth hires for each skill category. In other words, respondents would consider a category of skills—for example, Basic Skills—and compare the required level of these skills to the level of the skill exhibited by youth hires in the firm. The skill deficit rating is measured on a 5-point scale, with a rating of 1 indicating that most employees met the skill requirements, and as a result, there is little to no skill gap present. On the other hand, a rating of 5 indicated that most employees did not meet the skill requirements at all and that there was a critical gap present for the relevant skill. Where a skill was not identified as applicable to a certain occupation, respondents did not provide an estimate of the skill gap.

Due to the small sample size, we adopted a case study approach, which “allows in-depth, multi-faceted explorations of complex issues in real-life settings” (Crowe *et al.*, 2011: 1). While not representative of all firms in the sectors, the results obtained provide valuable initial insights into the various industries in the South African context.

31 For example, mathematics may be classified as a low-level skill for a receptionist, while it would be classified as a high-level skill for a professor of mathematics at a university.

32 It is important to note that there is not necessarily a correlation between the importance of a skill and the level of a skill: for example, a receptionist taking telephone messages for their superior may not require a high level of active listening, however, it is essential that this skill is present in order for the individual to complete their daily tasks. In this case, the “active listening” skill would present as low-level, but high-importance.

The following subsections turn to the results obtained from the interviews. We begin by discussing current and future youth employment (in all sectors), followed by skill requirements, and conclude by examining current skill deficits.

7.2 Youth employment: Current and expected

In order to assess the future employment potential for the youth in all four sectors, it is necessary to understand the roles that the youth currently occupy in each of these sectors. In the tourism sector,³³ the three most common occupations identified by the surveyed firms as relevant to youth are chefs, waitrons, and front office staff. These occupations comprise the majority of interviewed firms' current workforces. In fact, two firms reported that these three occupations account for over 80 percent of their current workforce. Furthermore, certain occupations were associated with different responsibilities depending on firm type. For example, front office staff in high-end hotels were at times referred to as "guest liaisons" where responsibilities include interacting with guests and servicing their needs throughout their stay. On the other hand, within a hotel environment, front office staff could also refer to receptionists who are responsible for guest check-in and bookings.

In the horticulture sector, two of the three interviewed firms indicated that they employ either no or very few youth. However, all respondents indicated that this number was highly variable, especially since all three firms employ seasonal workers to assist during peak season. In fact, one respondent indicated that youth could account for up to 61 percent of employment in the peak season.

In both the agro-processing and logistics sectors, youth comprised between 2 percent and 8 percent of the workforce. A potential explanation for this low level of youth employment in both sectors is to do with the high formal education requirements present in the sectors, which will be discussed further in the following section.

In the horticulture, agro-processing, and logistics sectors, most firms indicated they only employ a small number of youth. In agro-processing and logistics, youth comprised between 2 percent and 8 percent of the workforce. One explanation for this low level of youth employment, specifically in the logistics industry, is to do with the high formal education requirements present in this sector, which will be discussed further in the following section.

In terms of expected job creation, respondents indicated they expect to create a total of 458 jobs over the next five years across all four sectors, 158 of which are expected to be in the tourism sector.³⁴ Of these, 115—or 73 percent—would come from occupations that already exist within the firm, while 33—or 27 percent—would come from firms hiring individuals for "new" occupations³⁵—not necessarily jobs that don't currently exist in the world of work, but rather could be—and generally are—occupations that already exist in the economy, but that respondent firms do not have listed as part of their current workforce.

In horticulture, a total of 18 jobs are expected to be created within the next five years, with 55 percent of potential new jobs in the farm worker occupational role.³⁶ A key insight is that all new jobs are

33 A list of the tourism firms interviewed is available in the Appendix as Table B1.

34 Two firms—the edutainment business and a restaurant—did not have future expansion plans, or they were at their maximum capacity, and thus could not provide us with future job opportunity information.

35 Although these—and subsequent—numbers are quoted in the absolute, many interviewed firms indicated that they were unsure of exactly how many jobs would be created through their expansion plans and could simply give an expectations-based estimate of job creation. Thus, these figures serve as a best estimate for the number of jobs to be created, although practically, job creation may differ from the figures reported here.

36 Although respondents indicated that these jobs could cater towards youth, the roles would likely be filled by non-youth hires. One respondent noted that young individuals generally were not interested in taking manual jobs in horticulture, making the pool of available youth hires much smaller.

expected to come from current occupations—no new occupations were identified by any of the respondents.

In agro-processing, the potential for youth employment in the future is relatively large: The three respondent firms indicated that they expected to create approximately 186 jobs that could be filled by youth hires within the next five years. These jobs are predominantly as a result of expanding current operations (90 percent of the created jobs would be within existing occupations).

The logistics industry seems well-positioned to create a large number of jobs for youth, with an estimated 96 jobs created within the next five years. However, these jobs are mostly concentrated within one company in the role of merchandiser. Furthermore, only one new occupation was identified for the logistics industry—that of a data analyst.

Overall, the finding that most new jobs will come from existing occupations is consistent with the expansion plans outlined by firms across all sectors: In general, firms were focused on expanding their capacity for their current economic activities, rather than increasing the suite of services offered to clients. This expansion trajectory would naturally then lead to a more-than-proportional growth in existing occupations compared to new occupations, as reflected in the data.

7.3 Skill requirements for the youth

Formal education requirements

Table 22 shows the number of occupations that require a certain level of education across the sample of firms.³⁷ In general, just under half of all occupations present in respondent firms require completed secondary education or lower. In general, this finding speaks towards job creation potential for relatively lower-skilled youths, particularly in the tourism sector, where these occupations are concentrated. Of all the interviewed firms, those in the agro-processing industry present as the most skill-intensive, with half of their current occupations requiring a completed degree or postgraduate degree.

Table 22. Minimum educational requirements for current occupations, all firms

Educational level	Number of distinct occupations requiring this educational qualification			
	Tourism	Horticulture	Agro-processing	Logistics
No formal education	6	2	1	
Secondary	4	1	2	1
Post-secondary	4	1	1	7
University degree		1	3	
Post-graduate degree		1	1	

Source: Own data.

Note: Formal education requirements represent the modal education requirement reported by firms in a given category.

Education requirements in logistics are also relatively high, with all occupations requiring at least a completed secondary education, and seven out of eight occupations requiring some sort of post-secondary non-degree qualification. This finding may explain the low youth representation rate in logistics firms. The education requirements seem relatively homogenous in level (Table 22). Notably, the high education requirement for merchandisers³⁸—the majority of the jobs in the logistics sector—are likely to act as a barrier to the logistics industry being a key player in driving youth employment in the future.

³⁷ More detailed tables, showing the minimum educational requirements by occupation and firm type, is available in the Appendix as Tables, B5, B7, B8, B10.

³⁸ See Appendix Table B10.

On the contrary, educational requirements in the horticulture and agro-processing industries are much more spread out: Individuals with low levels of formal education can find jobs as general workers or factory workers in the agro-processing industry, or as field workers in the horticulture industry. On the other hand, those with high levels of education can find jobs as seed analysts and product developers, or laboratory analysts and section managers in the horticulture and agro-processing industries, respectively.

Shifting focus to *future* occupational skill requirements, Table 23 shows the minimum expected education requirements for new occupations that are expected to be created in the surveyed firms over the next five years.³⁹ In general, according to respondents, the education level that will be required for new occupations is higher than what is required for existing occupations in each industry. This result is most striking in the tourism sector, where respondents report that approximately 71 percent of new jobs will require a post-secondary education or higher—significantly higher than the estimated 12.5 percent of new jobs requiring a post-secondary education in all IWOSS sectors (see Table 15). This difference might be explained by the number of tourism firms interviewed, which was small and, thus unlikely to be broadly representative of the tourism sector.

Table 23. Minimum educational requirements for future occupations, all firms

Educational level	Number of distinct occupations requiring this educational qualification			
	Tourism	Horticulture	Agro-processing	Logistics
Secondary	3		4	
Post-secondary	3		2	
University degree	2		2	
Post-graduate degree				1

Source: Own data.

The educational requirements for new occupations in the agro-processing industry, however, are highly comparable to those for existing occupations: Overall, hires will require at least a completed secondary education, with half of new occupations requiring further study in the form of a post-secondary qualification or degree. This finding is broadly in line with the overall educational requirements for new IWOSS jobs (see Table 15). The relatively high minimum educational qualifications support the finding that the agro-processing sector is unlikely to cater to low-skilled youth employment in the future.

One firm in the logistics industry identified “data analyst” as a potential source of employment. Notably, this occupation requires a postgraduate degree specialized in information systems or computer science, which is a particularly high educational requirement, especially for youth between the ages of 15 and 24.

Hard, soft, and digital skill requirements

This section examines firm responses regarding hard, soft, and digital skill requirements for the occupations identified above. Hard and soft skills are assessed along two dimensions, following the O*NET organizing framework: the importance⁴⁰ of the skill, and the level⁴¹ at which the skill is required in a given occupation. Digital skills are assessed more broadly as they pertain to each industry. Detailed results for hard and soft skill results are available in the appendix (Figures B1-B4).

³⁹ A more detailed table, showing the minimum educational requirements by occupation and firm type, is available in the Appendix as Tables B6 and B9.

⁴⁰ The degree to which the skill is required to carry out day-to-day tasks.

⁴¹ The complexity of the application of the skill in day-to-day tasks.

Broadly speaking, the surveys reveal that, for the respondents the importance of skills outstrips the level at which the skill is required. Table 24 presents the level and importance of each skill grouping across the four industries of interest. On average, the agro-processing industry shows the highest skill level and importance figures, followed by horticulture. The tourism industry, on the other hand, indicated a relatively low average skill level of 1.6 out of 5, with a corresponding average importance of 2.56 out of 5. These results are indicative that the tourism industry may be best-placed to absorb low-skilled labor, while the agro-processing industry would be least well-placed to do so.

Table 24. Average importance and level of hard and soft skills, all sectors

	Importance	Level	Importance	Level	Importance	Level	Importance	Level
	Tourism		Horticulture		Agro-processing		Logistics	
Basic skills	2.70	1.65	3.56	2.38	4.52	2.79	2.96	2.24
Problem solving skills	1.96	1.35	3.18	2.64	4.87	2.88	3.16	2.46
Resource management skills	2.95	1.80	3.93	2.60	4.78	3.75	4.33	3.54
Social skills	2.65	1.55	3.84	2.74	4.68	2.84	2.28	1.70
Systems skills	2.47	1.47	4.18	2.95	4.85	3.18	2.22	1.80
Technical skills	2.63	1.76	3.86	2.93	2.41	2.31	3.69	2.84
Aggregate	2.56	1.60	3.76	2.71	4.35	2.96	3.11	2.43

Source: Own data.

Note: Averages are calculated by weighting responses according to the proportion of jobs in interviewed firms represented by the response.

Of all the skill groups identified, respondents across all industries rank resource management skills of the highest importance. For example, in the logistics industry, respondents considered resource management skills for documentational assistants and operational assistants critically important for operation of the firm.⁴² Systems and technical skills were highly valued by employers in the horticulture industry, although especially so in more analytical, laboratory-based roles, such as plant pathologists and seed analysts.⁴³

Employers in the agro-processing industry indicate that all skills, except technical skills, are of very high importance for their firms. Although the level of skill is generally not expected to be very high, a large proportion of skill groupings are ranked at maximum importance. More specifically, respondents indicated that their businesses operated potentially dangerous machines and so were held to high safety and hygiene standards. These factors go some way towards explaining the high importance level of some skills: In order for workers to maintain the high standards expected in the industry, it is critical that they possess and display the required skills for their jobs.

Further to the above hard and soft skill requirements, the majority of occupations identified by firms as pertaining to youth require some level of digital skills. Digital skills, as defined by UNESCO (2018) are “a range of abilities to use digital devices, communication applications, and networks to access and manage information.” Due to their importance in the current economic climate, these skills are interrogated separately in the survey instrument.

Although the level of digital literacy required varied by respondent, firms across all industries indicated that workers had to possess some rudimentary digital ability at the very least. At a basic level, housekeepers in mid-tier hotels are expected to report their housekeeping progress through task-

⁴² In the cases of these two roles, individuals are expected to coordinate the procurement of documentation and shipping of products to clients, thus explaining why the resource management skills are considered critically important.

⁴³ It should be noted that these occupations were only identified as applicable to youth by one firm: the seed distributor. As a result, it is impossible to know whether this measure of importance is representative of the industry view of the importance of these skills.

management software and waitrons are expected to be able to use point-of-sale systems to place orders, as well as operate card payment machines. More advanced digital skills are required in the case of aquarists, plant pathologists, and seed analysts, for example, who are expected to be able to research and read scientific journals using online search engines, as well as interpret and analyze data using digital machinery and data manipulation packages such as Microsoft Excel.

Furthermore, respondents were generally of the opinion that digital skills would become more important in the future operations of their firms, with firms in the agro-processing industry indicating that individuals without some level of digital literacy would soon be unable to complete the tasks required of them in their jobs. Furthermore, respondent firms in the tourism industry noted that the use of tablets in the workplace was likely to become more common. In particular, hotels across our sample reported that they were at various stages of rolling out a digital system to track and monitor housekeeping activities. A number of these hotels indicated that they would adopt this system fully within the next calendar year.

Firms also indicated that online management of human resources and payroll practices would become increasingly important across the vast majority of firms, with online self-service portals being set up to manage employees' leave, pay slips, and shifts. A shift from paper-based to digital human resource management would require increased digital literacy on the part of the employee, ultimately increasing the digital skills requirement in the tourism sector as a whole.

7.4 Skill gaps of the employed youth

This section analyses firm responses on skill gaps relating to the hard and soft skills described in the previous section. Bearing in mind that these skill deficits apply to those youth already employed in each relevant industry, these results should be considered in conjunction with those found in Section 6. In particular, if a formal education skill gap for youth in a particular industry exists, the results presented in this section indicate that these unemployed youth may well be disadvantaged with skill deficits in competencies⁴⁴ as well.⁴⁵ The skills deficit rating used for this section ranges across a 5-point scale, with a rating of 1 indicating most employees met most skill requirements of their roles, while 5 indicates most employees did not meet the skill requirements at all.

Table 25 (below) shows the results from these surveys.

Table 25: Skills deficit: All sectors

Skills group	Skills deficit value			
	Tourism	Horticulture	Agro-processing	Logistics
Basic skills	2.3	3.0	2.7	2.0
Problem solving skills	2.7	3.0	1.0	1.5
Resource management skills	2.3	3.7	2.0	2.7
Social skills	2.3	1.7	2.0	2.7
Systems skills	2.4	5.0	1.0	1.0
Technical skills	1.8	3.0	1.7	1.0
Aggregate	2.3	3.2	1.7	1.8

Source: Own data.

Note: The skills deficit rating used in this table ranges across a 5-point scale, with a rating of 1 indicating most employees met most skill requirements of their roles, while 5 indicates most employees did not meet the skill requirements at all.

⁴⁴ Competencies refers to the six overarching skills categories provided by O*NET: basic, problem solving, resource management, social, systems and technical skills.

⁴⁵ Skills does not only refer to educational qualifications but competencies as well. Thus, skill gaps do not only refer to individuals not having the correct educational qualifications but also the right competencies.

Overall, the skill deficit of employees is greatest in the horticulture industry, with a score of 3.2 out of 5. A respondent in the horticulture industry indicated that skills among new hires are critically underdeveloped in the youth, but not necessarily from a lack of education. In fact, this respondent indicated that they felt the skill deficit was attributable in large part to a lack of practical application and experience obtained in the current education system, resulting in individuals who had the requisite educational attainment level, but were unable to cope with the practical problems presented to them. Although this situation is of concern, it also suggests that these skills could be developed among youth by learning on the job.

The tourism sector has the second-highest average skill gap, with a measure of approximately 2.3 out of 5, indicating a moderate skill gap. Of particular concern here is the deficit of social skills present among youth in the tourism industry, especially given the customer-facing nature of many of these occupations. Employers in the tourism sector have noted, however, that the deficit in social skills in youth hires is particularly pronounced at the start of their employment. These skills do develop over time through on-the-job experience and through gaining confidence in one's role.

Resource management—primarily time management in the context of the occupations covered—was also noted to be a key area of deficit across all firms. Many interviewees stated that cell phones easily distract young employees from performing their duties. Since resource management skills were rated among most important skill groups across all occupations in the respondent firms, its high deficit is a concern.

Interestingly, in agro-processing, despite the required high levels of education and the high importance of soft skills, the skill deficit in the sector is not severe, with an average score of only 1.7 out of 5. The highest skill deficit—in basic skills—reaches a value of 2.7, indicating only a moderate deficit. The level of this deficit is consistent with that in the tourism and horticulture sectors, which lends support to the argument that individuals are not being adequately prepared for work in this sector by South Africa's formal education system. For the remainder of the skill groupings, however, deficits are low, with systems skills and problem-solving skills reported as not in deficit at all.

7.5 Overall insights

In summary, the results suggest that the types of jobs created in each of the four target industries are varied and could cater to different sections of the unemployed youth population. While the tourism and horticulture industries seem to provide the most scope for catering towards low-skilled individuals, the agro-processing and logistics industries would cater towards higher-skilled individuals.

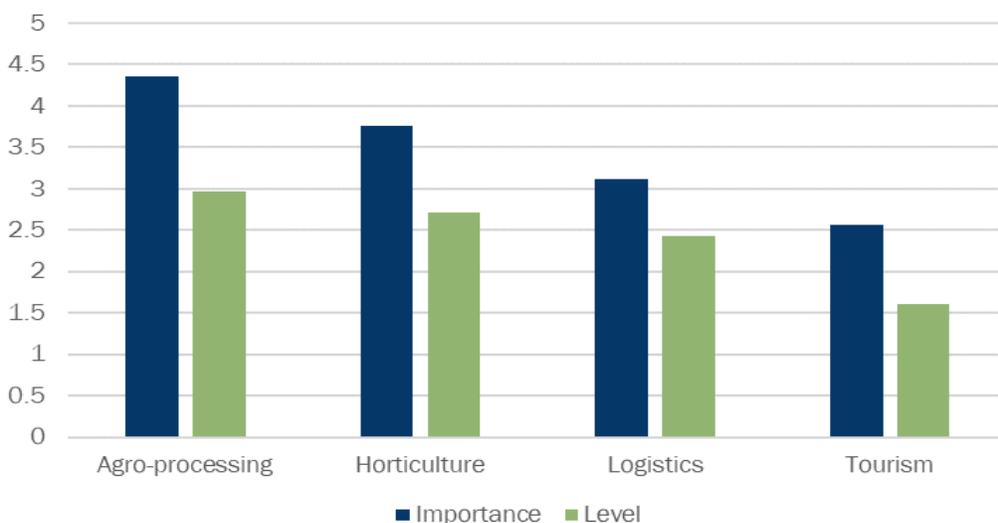
Consistent with the findings in Section 6, it seems that the majority of formal skill requirements are low—whether they be for current or new occupations. Many firms indicated that they would look for employees with a secondary education to fill the majority of the roles they would create. A much smaller proportion of roles would require post-secondary (certificate/diploma) qualifications or degrees.

The weighted average level and importance of soft skill requirements are presented in Figure 9. These results paint a slightly different picture to the formal educational requirements, and instead indicate that the horticulture sector requires the second-highest level of soft skills out of all sampled IWOSS sectors—a finding likely driven by the sector's need for many laboratory technicians and plant pathologists, and does not necessarily take away from the high employment potential for unskilled youth in roles requiring less specialized skills, such as farm workers, operators, and plant extractors. The tourism sector still presents as a potential employment opportunity for low-skilled workers, with a low aggregate level of soft skills required in this sector.

Turning the focus to job growth, the results are more heterogenous: Although a total of approximately 458 jobs were expected to be created across all 18 interviewed firms in the next five years, the number of jobs per firm differ greatly by industry. Interviewed firms in the agro-processing industry showed the

highest job creation potential over the next five years, with 62 jobs per firm, while the interviewed horticulture firms project to create approximately 6 jobs per firm. This job growth pattern is heavily skewed towards semi-skilled occupations, which is concordant with the findings in the data from Section 6.

Figure 9. Average level and importance of soft skills by IWOSS sectors



Source: Own data.

Note: Averages are calculated by weighting responses according to the proportion of jobs in interviewed firms represented by the response.

It should, however, be noted that all respondent firms indicated an increasing reliance on digital skills for the majority of their occupations. Firms indicated that these skills would become increasingly important in the medium term and that there will be little scope for future new employees who do not possess at least some form of rudimentary digital literacy.

However, high deficit scores in certain key skill groups (basic, social, and resource management skills) suggest that finding youth to fill the positions that are created may be challenging. Assuming that unemployed youth have similar, if not greater, skill deficiencies than employed youth, the soft skill deficits found in this section are concerning for the employability of future youth. A particular deficit that appeared across all industries was that of basic skills. Given that basic skills include those skills that should be developed in early stages of formal education—e.g., reading, mathematics, active listening—it may be worthwhile to more carefully monitor the South African education system to uphold education standards to those required by firms.

Table 26 presents a summary of the incidence of job creation and skill deficits across the interviewed IWOSS firms. From the first row of the table, it is clear that the majority (42 percent) of new jobs are projected to be created in the agro-processing sector, with the overwhelming majority of these jobs being in occupations that currently exist within the firms. Across the 18 interviewed firms, a total of 448 jobs were expected to be created, with 96 percent of these occurring in sectors that present with relatively low skill deficits of between 1.7 and 2.29 out of 5.⁴⁶ Only 4 percent of jobs projected to be created by these firms are as a result of the horticulture sector, which presents the highest aggregate skill gap of employed youth.

⁴⁶ Recall that the scale used in measuring skill deficits codes 1 as “Meeting skill requirements.”

An important finding is the degree of heterogeneity across the firms and across industries more generally, a trend that should be taken into account when designing policies for increasing employment in the sector. The differences between and within sectors must be recognized and understood so that appropriate actions can be taken to grow the sector and for youth to be able to access employment in them.

Table 26. Incidence of job growth and skill deficits, IWOSS sectors

Sector	Agro-processing	Horticulture	Logistics	Tourism	All
Share of jobs created	0.42	0.04	0.21	0.33	1.00
... from existing occupations	0.38	0.04	0.20	0.26	0.88
... from new occupations	0.04	0.00	0.01	0.07	0.13
Average skill deficit (out of 5)	1.70	3.20	1.80	2.29	1.98

Source: Own data.

Note: Figures may not add up correctly due to rounding.

8. Policy recommendations

In prescribing policy options for IWOSS, and specifically the four industries of focus in this study, we emphasize that these industries are heterogeneous and, as such, there is no single policy prescription or “magic bullet” that will unlock growth for these sectors. Rather, a coherent plan, with multiple policies which complement each other, will unlock the growth potential of IWOSS sectors.

Thus, this section explores four high-level interrelated recommendations for enabling growth and job creation in IWOSS sectors. These are:

1. Facilitating an enabling operating environment in which firms can thrive across the economy.
2. Crafting and implementing policies that focus on enabling the growth of specific IWOSS sectors and addresses the specific constraints faced by different IWOSS sectors.
3. Developing relevant skills that will support the growth of IWOSS sectors.
4. Ensuring that all policies to grow the economy and IWOSS are inclusive.

8.1 Facilitating an enabling operating environment to promote economic growth

The country-level constraints to economic growth discussed in Section 5—particularly infrastructure, fiscal consolidation, labor market regulation, and corruption—must be addressed to facilitate an enabling operating environment for firms to grow so that employment can be generated. Here, we propose some changes that can be made to facilitate an operating environment. We focus specifically on infrastructure development and government spending challenges.

Infrastructure

In respect to infrastructure, it is important that there be adequate investment in the right type of infrastructure. In this regard, municipalities have a large degree of power on how to spend the money allocated to them on infrastructure. Unfortunately, many municipalities consistently underspend on infrastructure (Fourie, 2006). Therefore, as a first policy priority, institutional capacity at a municipal level must be increased, especially in the engineering and town-planning fields (Fourie, 2006).

Secondly, the emphasis in infrastructure development is currently on building new infrastructure. However, the quantity of infrastructure is less of a problem than the quality of infrastructure in South Africa. A greater amount of money should be allocated to the maintenance, rehabilitation and upgrading of existing infrastructure (Fourie, 2006).

Finally, transnational infrastructure development—key to facilitating economic integration between countries—should be a policy priority. Currently, there is an existing corridor of three South African provinces—Gauteng, Limpopo and Mpumalanga—with Maputo, the capital of Mozambique. However, this corridor only includes two countries. For developments that involve more countries to become a reality, institutional capacity in organizations such as the Southern African Development Community and the Southern African Customs Union must be improved, and appropriate financing arrangements need to be put in place.

Government spending

Lower-than-expected revenue collection emanating from a combination of slow economic growth, high unemployment, and a shrinking tax base has forced the government to lower its expenditure. In this regard, Tito Mboweni, the South African finance minister, has also suggested that South Africa should move to a zero-based budgeting approach (Business Insider SA, 2020), which requires each government department to justify their budget each year, rather than use the previous year's departmental budget as a starting point for budget negotiations. This requirement offers the opportunity for higher allocations for projects if their returns on investment are high enough, but also creates the possibility that budgets will actually be lowered.

The risk of corruption in all levels in the public sector (and this loss of public funds) has not disappeared in South Africa, a multi-faceted approach with accountability, a meritocratic public service, and strongly funded and supported anti-corruption bodies such as the National Prosecuting Authority is required (Gumede, 2017).

8.2 Focused policies that enable the growth of specific IWOSS sectors

Tourism

Formal private tourism employment grew by 26.9 percent between 2010 and 2018, from 669,000 to 849,000 workers.⁴⁷ Considering the relative size of the industry (in terms of employment), this impressive figure reinforces the importance of tourism as a sector with potential to generate a large number of new jobs, especially low-skilled ones that can benefit the youth. Both our quantitative analysis and the firm survey supplement these findings. However, for the employment potential of the sector to be achieved, a number of constraints need to be overcome. These include:

- Negative perceptions of South Africa as a tourist destination and the lack of ease of access to South Africa, and
- The concentration of tourism experiences in South Africa, and the lack of inclusion of individuals from disadvantaged backgrounds within the service provider segment of the value chain, particularly.

However, as the above evaluation of the constraints of the tourism value chain reveal, the multifaceted nature of tourism requires many different parts to work together. In particular, private-public cooperation is vital to secure the future of the tourism industry. Indeed, this is the underlying thrust of the policy recommendations provided by Saunders (2019),⁴⁸ outlined immediately below.

Actively develop and promote tourism markets in less established areas. According to Viljoen & Tlabela (2007), current tourism marketing is focused on promoting South Africa's established tourism markets in Cape Town, Johannesburg, and Durban. The little attention paid to less-developed tourist regions limits the growth of the industry more broadly as well as excludes of disadvantaged individuals in the

⁴⁷ Refer to Table 3.

⁴⁸ Saunders was a special advisor to the previous tourism minister, Derek Hanekom.

tourism sector. More active development of and marketing for these smaller markets—especially with increased support from SA Tourism—can encourage travel to these outlying markets.

Enhance crime-prevention strategies, especially in tourist hotspots. In this regard, the tourism industry and the country’s South African security apparatus—including the South African Police Service, the metro police, and the private security industry—must coordinate more closely. Leaders should also examine lessons learned from other countries that have successfully tackled crime threatening their tourism markets.

Develop and implement a world-class e-visa system. An easy-to-use interface, support for multiple languages, non-onerous documentation requirements, and quick turnaround times for visa applications will increase ease of access to South Africa as a tourist destination. The government could also develop a national air access route initiative that incentivizes airlines to add new routes and increase capacity and frequency of flights. Indeed, in 2019, Wesgro—the Western Cape’s tourism, trade, and investment promotion arm—successfully lobbied U.S.-based United Airlines to offer the first non-stop flight from the United States to Cape Town (Puckett, 2019). Similar efforts could increase the overall number of travelers to the country.

Horticulture

Formal private employment in horticulture increased from 243,000 to 331,000 between 2010 and 2018, an increase of 36.2 percent over the period—and 1.4 times greater than the overall agriculture sector. Future growth is expected in key export markets as the middle class expands, especially in Asia (Kharas, 2017). The potential of horticulture for employment generation has attracted the interest of policymakers, who have committed to pursuing several policies: expanding irrigation infrastructure so that the horticulture growing area can expand by 50,000 hectares; assistance for exporters to obtain various product quality certifications; and the designation of a horticulture representative on a committee investigating the improvement of transport links between areas of production and export hubs (Sihlobo, 2018).

We have shown that horticulture has many job opportunities for the low-skilled youth in particular. However, numerous constraints faced by firms undermine investment in the sector, and consequentially the ability of the sector to generate jobs. Key constraints include:

- Insufficient financial support to farmers (as well as other individuals who wish to enter other components of the value chain), and
- Inadequate infrastructure that inhibits production and distribution from farmers to wholesalers and to retailers.

To overcome these constraints, Lemmer (2017) outlines a few major policy recommendations that, if enacted, would enable growth of the sector. These include:

Implement comprehensive water infrastructure development. South Africa is the 30th driest in the world (World Wildlife Fund, 2020) and experiences extreme “dry years,” that create intense water shortages. As such, policymakers should increase support for project that expand the storage capacity of South Africa’s dams, maintain the upkeep of water irrigation schemes, and more efficiently utilize its current water reserves.

Allocate sufficient financial aid to the agriculture sector in order to mitigate shocks: The tough climatic conditions that face the country’s agriculture sector create the conditions for negative shocks such as drought and pests. Furthermore, the development of affordable, specialist insurance products that cover natural disasters is necessary.

Partially subsidize input costs for emerging farmers: To encourage new entrants into the industry, the government should partially subsidize the high input costs for emerging farmers. High input costs act as a barrier to entry to new market entrants, resulting in an industry that is highly concentrated and will not provide additional employment opportunities for the youth.

Agro-processing

Formal private employment in agro-processing increased by 43,000 between 2010 and 2018—an increase of 8.0 percent over the period and a stark contrast to the overall manufacturing sector, which experienced a 3.1 decrease in employment during that time. The fact that the agro-processing sector was able to generate jobs as a sub-sector when the overall sector is shrinking indicates that it is resilient in face of economic difficulties and can be expected to experience faster growth when more favorable economic conditions return. However, for the substantial employment potential to be reached, decisive action needs to be taken to address key constraints faced by the sector. These include:

- High costs and a lack of access to capital, and
- Lack of support to small- and medium-sized enterprises in particular.

Owoo and Lambon-Quayefio (2018) discuss a number of policies that helped the Ghanaian agro-processing sector grow and may be applicable to the South African agro-processing sector given the similar challenges that the sectors face in each country (Dube et al., 2018). These include:

Create a comprehensive incentives program for imported agro-processing equipment and inputs. Incentives could take the form of a reduction in the value-added tax and/or import duties on specified equipment and inputs such as fertilizer. Furthermore, given the large role that agro-processing plays in exports in the South African economy—it accounts for 10 percent of South Africa’s total exports (DAFF, 2019)—policymakers should explore the feasibility of an Export Processing Zone for agro-processing to further increase exports.

Increase the co-ordination between the public and private spheres around relevant technology. Much of the equipment and inputs used in agro-processing are expensive because they are imported. To reduce this reliance on imports and enhance competitiveness, it would be worthwhile for the government to facilitate technological transfer between publicly funded research institutions (such as universities) and the private sector, which can utilize these inventions.

To aid small businesses in overcoming stringent food safety standards, Humphrey (2017) provides a number of policy options. These include:

Create government-funded training programs on reaching stringent food safety standards, especially for small businesses that go from low (or no) food safety standards to one with more exacting standards in a rapid space of time.

Impose the same food safety standards in the domestic market as the export market.

Transit trade (logistics)

The logistics sector experienced robust employment growth between 2010 and 2018, with formal private employment in the sector increasing by 31.3 percent from 332,000 to 436,000 employees.⁴⁹ South Africa’s logistics sector is advanced compared to most in the region: A report comparing South Africa’s logistics sector to nine other African economies found that South Africa had the most developed one (PwC, 2018). The country was also rated best for trade facilitation logistics and transport infrastructure in Africa (PwC, 2018). As such, South African logistics companies seem well-placed to expand into Africa more broadly and take advantage of the surge in demand for raw materials

⁴⁹ Refer to Table 3.

in other African countries, as well as develop well-structured supply chains in retail and manufacturing sectors in Africa (PwC, 2018).

While the results of our study suggest that job opportunities for low-skilled youth will be limited, for the youth who obtain the requisite education, there are multiple job opportunities along the logistics value chain. For those opportunities to be realized, however, constraints facing the sector must be overcome. These include:

- The lack of integration within the sector,
- The lack of a coherent national policy framework for the sector, and
- Inefficiencies along the value chain.

To this end, it is worth examining the case of Saudi Arabia, which transformed its logistics sector into a significant economic growth enabler. In 2019, the Governor of the Saudi Arabian General Customs Authority, His Excellency Ahmed Alhakbani, outlined key lessons that other countries could learn from Saudi Arabia at the International Federation of Freight Forwarders Associations conference (Sivalingum, 2019). These include:

Take an integrated approach to the logistics sector. The logistics sector should not be treated as a sector that can operate by itself, but rather one that is involved in many others, like agriculture, mining, and manufacturing. In South Africa, this move would require a coherent national strategy for the sector as well as mechanisms to ensure that the sector is integrated with others in the economy.

Eliminate regulations that increase the difficulty of doing business and adopt technologies that make businesses more efficient. Alhakbani states that, in Saudi Arabia, a regulatory change that reduced the required number of forms and allowed for electronic submissions reduced the average customs clearance time from eight days to less than 24 hours (Sivalingum, 2019). Furthermore, Saudi Arabia introduced an innovative truck appointment system that reduced the average time to offload goods from 2 to 3 hours to 30 minutes. Technology was key: In Saudi Arabia, most clearance procedures are automated, and the government has developed an integrated electronic platform that makes 135 services easily available to customers.

Cooperate with global organizations to reduce the number of obstacles that hinder the free flow of goods through the country. The primary instrument to achieve this goal would be Free Trade Agreements (FTAs), which remove barriers to trade between signatories of the FTA. Currently, SA has FTAs with the European Union and the European Free Trade Association (Lichtenstein, Norway, Switzerland and Iceland) (Centre for Export Development, 2018). In addition, South Africa recently signed the African Continental FTA, which involves tariff free access for 97 percent of goods across the African continent. According to the South African Institute of International Affairs (2020), the agreement will result in \$16.1 billion in welfare gains, an increase in GDP growth between 1 percent and 3 percent and intra-African trade growth of between 33 percent and 50 percent. Despite this progress, South Africa still lacks FTAs with three of its five biggest export trading partners—China (1st), U.S. (3rd), and Japan (5th) (Workman, 2020) and reaching an FTA must be a priority going forward.

8.3 Developing skills to support the growth of IWOSS sectors

There are two possible skill requirement implications of increased growth in IWOSS sectors, depending on the type of IWOSS activities that are growing. In short, when IWOSS growth occurs in sectors that favor low-skilled employment, skills do not need to be formally developed. Conversely, IWOSS sectors that offer opportunities for low-, medium-, and high-skilled employment require a labor pool with a range of skill levels.

Overall, the projected skill gaps for the current and higher IWOSS growth path scenarios suggest that there will be a large labor surplus of youth for roles in the IWOSS sectors. However, for occupations

that require either an undergraduate or postgraduate university degree, there may be challenges in finding youth specifically with these educational qualifications. In order to ensure a sustainable supply of individuals educated at the required levels, Asmal et al. (2020) suggest that there be a demand-led approach to the attainment of qualifications through a collaboration between employers and post-secondary educational institutions. Employers can provide input regarding their skill requirements in order for the youth to obtain qualifications valued in the labor market. As skill requirements differ across sectors, businesses across all sectors must be consulted on a regular basis. This consultation is particularly important in an era in which significant changes in the labor market are predicted to occur because of the Fourth Industrial Revolution.

Providing better qualification support is not enough, however, because soft skill gaps exist as well in different sectors and occupations, as demonstrated in the firm surveys. Profound changes in the nature of work will increase the value of soft skills in the future as employers look for individuals who are proactive, collaborative, and adaptable. As the firm surveys show, youth, including those who are employed, often lack not only formal qualifications, but also soft skills. Possible measures to increase the number and intensity of soft skills, according to Lapm (2016), include the following:

- Including compulsory courses on public speaking and written and verbal communication in all post-secondary schooling courses. All students can benefit from developing skills such as listening, eye-contact, and communicating ideas in a coherent fashion.
- Promoting a culture of volunteerism at secondary school and post-secondary educational institutions. Volunteer work can develop skills such as teamwork, time management, and written communication. Further, it can teach young people the importance of performing tasks without obtaining any personal gain.
- Encouraging extracurricular teamwork activities. These activities can range from team-based sports to participation in religious institutions or music bands. Participation in such activities can teach young people the importance of working together to achieve a goal.

Finally, it is important for employers to develop mentorship and ongoing training programs for new trainees. Mentors can teach life-skills to young people and highlight areas of strength and of improvement. Moreover, mentors are usually people who hold more senior positions at a company and, therefore, help new trainees understand the skills required to reach such a position—particularly considering skills that may not have been able to develop through the school system. From our firm surveys, it seems that horticulture, in particular, may be a sector in which this type of intervention may be important.

8.4 Promoting inclusive growth: Policy must be cognizant of the most vulnerable

When considering the policies described above, policymakers must consider the differing impacts such policies can have on under-represented groups such as women and the youth and incorporate the needs of those groups into national development strategies (Onyeiwu, 2015).

With respect to gender, while a number of IWOS sectors employ a considerable number of women, their access to employment in different occupations across the value chain is variable. For example, the Department of Tourism (2016b) notes that, despite women accounting for much of the employment in the sector, many of the women are in low-skilled occupations, with women comprising only 40 percent of managerial positions and 20 percent of general management roles. Career Junction (2019) surveyed 1,600 businesses and found a discrepancy between males and females in senior management positions in the logistics sector: 10 percent of males were in such positions, compared to only 4 percent of females. In other sectors, such as logistics, the representation of women is low at all levels. Turnbull (2013) finds that, while 43.8 percent of women participate in the South African labor market, they comprise only 19.6 percent of the employed in the transport, storage, and communications sector.

Policies need to incorporate channels through which those who remain excluded from participation in the economy (such as the women and the youth), are consciously targeted. For example, this may mean ensuring that tourism is developed in areas where there are currently no established tourism markets, or ensuring that women or youth are actively targeted and supported to obtain the skills that are required in IWOSS sectors, and linked to employment opportunities in those sectors.

In this regard, the legal environment can be used to achieve socially inclusive outcomes: Affirmative action measures in relation to hiring practices, equal pay for equal work, and higher education opportunities are all policy levers available to policymakers—some of which are already part of South Africa’s labor legislation. However, it is ultimately important that there is buy-in from all sectors of society to achieving inclusive growth. In this regard, developing inclusive growth policies with the private sector is important to facilitate an environment in which collaborative action can be taken by all relevant stakeholders to achieve the desired outcomes.

9. Conclusion

South Africa has been in a long-run, low-growth trap since the onset of democratic rule in 1994, resulting in persistently high rates of unemployment and relatedly rising income inequality levels. In the absence of manufacturing sector growth, “industries without smokestacks,” (IWOSS) which share a number of characteristics with manufacturing, may have the potential to produce both the number and type of jobs required in the country. IWOSS sectors are tradable, have relatively high value added per worker, exhibit the capacity for technological change and productivity growth, and show some evidence of scale and/or agglomeration economies. These sectors also have the potential to absorb low- and medium-skilled labor—an important facet for countries like South Africa with a large number of unemployed who are predominantly low-skilled.

The question for South Africa is not whether there is a role for IWOSS in the economy, but rather which particular IWOSS sectors have the potential to address South Africa’s unemployment crisis. The country already appears to be on a path of structural transformation characterized by a shift toward IWOSS, dominated by financial and business services. In this paper, through the use of a quantitative labor force survey-based analysis as well as firm interviews, we consider the employment potential of specific IWOSS sectors in South Africa and the obstacles around skill requirements and gaps among the youth hindering the country from meeting this potential.

Overall, IWOSS sectors seem to be more intensive in low-skilled occupations, and this intensity is increasing over time. While employment opportunities for skilled and high-skilled employment opportunities are also increasing, the shares of these skill categories is slowly shrinking. This finding suggests that IWOSS sectors may be better placed than non-IWOSS ones to provide jobs for the low-skilled unemployed in South Africa, while still providing jobs that can accommodate the higher-skilled among the labor force as well.

IWOSS also seems to be more female- and youth-intensive in its current composition of employment, suggesting that growth in the IWOSS sectors may provide greater opportunities for employment for these groups in particular. More specifically, we find that tourism, trade, and agro-processing are most intensive in employing women; trade, tourism, and horticulture are most intensive in employing the youth; and horticulture, commercial agriculture, and agro-processing most intensive in employing those with the lowest levels of education.

We project employment in IWOSS sectors between 2020 and 2028, and our findings suggest that, on the current growth path, the IWOSS sectors will be unable to generate the number and types of jobs

required. Our projections suggest a surplus of individuals with less than secondary education relative to the skill requirements of IWOSS on the current path. Our projections of employment on a growth path in which employment creation is increased in four IWOSS sectors (tourism, horticulture, agro-processing, and transit trade) suggest that employment can be increased considerably through growth of these sectors. Due to tourism's strong linkages to other sectors of the economy, employment growth in tourism will stimulate employment growth in these other sectors. In other words, tourism acts as an "employment multiplier". Horticulture is also expected to increase its share of the total change in employment considerably on this path.

The calculated sectoral skill gaps for this higher growth scenario, however, also suggest a suitable supply of skills is required to take advantage of future job opportunities. This concern is particularly acute in relation to new jobs in high-skilled occupations. In contrast, there is a sufficient supply of individuals with suitable skills to fulfil new jobs in low-skilled occupations.

The analysis was supplemented by 18 firm interviews across the four selected IWOSS sectors. The findings from the surveys suggest that the types of jobs created in each of the four considered IWOSS sectors are varied and could cater to different segments of the unemployed youth population. While the tourism and horticulture industries seem to provide the most scope for absorbing low-skilled individuals, the agro-processing and logistics industries are better oriented towards employing higher-skilled individuals.

Despite low formal qualification requirements for many of the jobs done by youth in the firms surveyed, high deficit scores in certain key skill groups (basic, social, and resource management skills) suggest that finding youth to fill the positions that are created may be challenging. Assuming that unemployed youth have similar, if not greater, skill deficiencies than employed youth, the soft skill deficits we find are concerning for the employability of future youth. A particular deficit that appeared across all industries was that of basic skills—skills that facilitate learning or the more rapid acquisition of knowledge. Government should ensure that basic skills are acquired by individuals through the education system. Further, all respondent firms indicated an increasing reliance on digital skills for the majority of their occupations.

An important finding, across both the quantitative analysis and the firm-interview results, is the degree of heterogeneity of skills requirements across the firms and across industries more generally. When designing policies for increasing employment in any sector, policymakers must consider the differences between and within sectors so that appropriate action can be taken.

Ultimately, the findings suggest that IWOSS do have a role to play in generating the numbers and types of jobs required to address youth unemployment in South Africa. Among the sectors considered, tourism and horticulture seem particularly well placed in this regard. However, importantly, challenges remain both from the perspective of the broader economy and individual sectors. South Africa's overall growth performance must be improved, and sector-specific constraints must be addressed—especially those related to skills—in order for the potential of these sectors to generate employment opportunities to be reached.

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Appendix A: Data tables

Table A1. How employment and employment share have changed in IWOSS and non-IWOSS since 2010

	Employment	Employment share		Annual % growth		
	2010	2018	Absolute	2010	2018	2010-2018
	('000)	(%)		(%)		
Total formal private employment	7,069	8,806	1,737	100.0	100.0	2.8
Total IWOSS	4,627	5,873	1,246	65.5	66.7	3.0
Agro-processing	549	593	43	7.8	6.7	0.9
Horticulture	243	331	88	3.4	3.8	3.9
Commercial agriculture (excl. horticulture)	146	200	54	2.1	2.3	4.0
Tourism	669	849	180	9.5	9.6	3.0
ICT	81	74	-7	1.2	0.8	-1.2
Transit	332	436	104	4.7	4.9	3.5
Finance	1,421	2,020	599	20.1	22.9	4.5
Trade (excl. tourism)	1,185	1,371	186	16.8	15.6	1.8
Total non-IWOSS	2,442	2,933	491	34.5	33.3	2.3
Mining	298	406	107	4.2	4.6	3.9
Manufacturing (excl. agro-processing)	873	851	-21	12.3	9.7	-0.3
Utilities	77	124	47	1.1	1.4	6.2
Construction	525	643	118	7.4	7.3	2.6
Community, social, and personal services	667	902	235	9.4	10.2	3.8
Other	2	7	5	0.0	0.1	14.0

Source: PALMS (2019).

Table A2. Breakdown of sectoral employment by skill level, 2018

	Employment			Share 2018		
	High skilled	Skilled	Low skilled	High skilled	Skilled	Low skilled
	('000)			(%)		
Total formal private employment	1,624	5,495	1,686	18.4	62.4	19.1
Total IWOSS	1,085	3,598	1,191	18.5	61.3	20.3
Agro-processing	61	375	157	10.3	63.2	26.4
Horticulture	13	53	265	3.8	15.9	80.3
Commercial agriculture (excl. horticulture)	16	58	126	8.0	29.2	62.8
Tourism	139	588	122	16.4	69.2	14.4
ICT	25	48	2	33.5	64.2	2.3
Transit	89	291	55	20.5	66.8	12.7
Finance	519	1,229	272	25.7	60.8	13.5
Trade (excl. tourism)	223	957	192	16.2	69.8	14.0
Total Non-IWOSS	539	1,897	496	18.4	64.7	16.9
Mining	24	283	99	5.8	69.8	24.4
Manufacturing (excl. agro-processing)	139	596	116	16.3	70.0	13.6
Utilities	28	91	5	22.9	72.9	4.2
Construction	114	392	137	17.7	61.0	21.3
Community, social, and personal services	231	533	138	25.6	59.1	15.3
Other	3	3	1	40.1	45.4	14.5

Source: PALMS (2019).

Table A3. Annualized GVA growth rate by industry, 2008-2018

Sector	GVA growth rate (%)
Agriculture	1.37
Mining	0.01
Manufacturing	0.84
Utilities	-0.33
Construction	1.35
Trade	1.71
Transport	1.96
Finance	2.26
Community, social, and personal services	1.79
Total	1.57

Source: Authors' calculations using Kerr, Lam and Wittenberg [PALMS] (2019) and StatsSA (2019).

Table A4. Annualized employment growth rate applied to project employment in IWOSS and Non-IWOSS sectors on the current growth path, 2019-2028

	Employment growth rate (%)
IWOSS	1.81
Agro-processing	0.84
Horticulture	1.37
Other commercial agriculture	1.37
Tourism	1.76
ICT	1.96
Transit trade	1.96
Finance	2.26
Trade	1.71
Non-IWOSS	1.08
Mining	0.01
Other manufacturing	0.84
Utilities	-0.33
Construction	1.35
Community, social, and personal services	1.79
Total	1.57

Source: Authors' calculations using Kerr, Lam and Wittenberg [PALMS] (2019) and StatsSA (2019).

Appendix B: Firm survey responses

A. Overview of activities of firms by sector

We provide an overview of the economic activities undertaken by each type of firm interviewed (by sector), as well as their corresponding 3-digit SIC code mapping, in the tables below.

Tourism

Table B1. Main economic activities by firm, tourism

Firm type	Description of economic activity undertaken	3-digit SIC code
High-end hotels (3)	Serve food and beverages	561, 563
	Luxury accommodation services	551
	Host weddings and conferences	823
	Spa services	960
Mid-tier hotels (2)	Serve food and beverages	561, 563
	Accommodation services	551
	Host weddings and conferences	823
	Spa services	960
Food and beverages (2)	Serve food and beverages	561, 563
	Provide food and beverage take-away services	561
Edutainment business (1)	Marine and environmental education	854
	Nature reserve/zoological activities	910
Broad-based business (1)	Serve food and beverages	561, 563
	Recreational sport (golf)	931
	Maintenance of sports grounds	931
	Real estate activities	681, 682

Source: Own data, StatsSA (2012).

Note: The number of firms interviewed by firm type is indicated in brackets. Among the five hotels interviewed, there is a clear delineation between 5-star hotels and the mid-tier hotels (4-star and 3-star). All 5-star hotels emphasized that one of their main functions was providing an experience that replicated what their clients would be familiar with at home, in terms of the 'home comforts' to which they were accustomed.

Horticulture

Table B2. Main economic activities by firm, horticulture

Firm type	Description of economic activity undertaken	3-digit SIC code
Flower grower and wholesaler	Growing flowers	011
	Selling flowers	476, 478
	Marketing and management of e-commerce website	620
Commercial nursery	Germinate and grow plants in hothouses	011
	Wholesale of plants to commercial retailers and landscapers	462
Seed grower and distributor	Growing flowers	011
	Seed production	011
	Specialized brand retail (seeds)	462
	General public retail activities (selling seeds)	476
	Landscaping services	813

Source: Own data, StatsSA (2012).

*Agro-processing***Table B3. Main economic activities by firm, agro-processing**

Firm type	Description of economic activity undertaken	3-digit SIC code
Fruit processing plants	Manufacture of citrus concentrates and oils	103
	Extraction of juice for concentrates/oils	103
	Retail trade of fruit and vegetables	472
	Warehousing and storage of fruit concentrates, oils and juices	521

Source: Own data.

*Transit trade***Table B4. Main economic activities by firm, logistics**

Firm type	Description of economic activity undertaken	3-digit SIC code
Media logistics firm	Freight transport (rail, road, air) of media products	491, 492, 511
	Merchandising in stores	731
	Sales consultation	702
	Account management	692
	Support activities to distribution	522
Perishable goods logistics	Freight transport (rail, road, air) of perishable goods	491, 492, 511
	Support activities to transport	522
Road freight logistics	Road freight transportation	492
	Support activities to road freight transport	522

Source: Own data.

A. Minimum educational requirements by sector

Table B5: Minimum educational requirements for current occupations, tourism firms

Occupation	Demanding firm industry	Formal education requirement
Aquarist	Edutainment	Secondary education
Barista	Mid-tier hotel	No formal education
	Food and beverage	No formal education
Bartender	Mid-tier hotel	No formal education
Chef	High-end hotel	Post-secondary education
	Food and beverage	No formal education
	Broad-based business	No formal education
Front office staff	High-end hotel	Post-secondary education
Junior restaurant manager	Mid-tier hotel	Post-secondary education
Maintenance staff	Broad-based business	No formal education
Room attendant/housekeeper	High-end hotel	No formal education
	Mid-tier hotel	Secondary education
Visitor services	Edutainment	Secondary education
Waitron	High-end hotel	Post-secondary education
	Mid-tier hotel	Secondary education
	Food and beverage	No formal education
	Broad-based business	No formal education

Source: Own data.

Table B6. Minimum educational requirements for future required occupations, tourism firms

Occupation	Demanding firm industry	Formal education requirement
Cashier	Food and beverage	Secondary education
Events coordinator	High-end hotel	Post-secondary education
	Broad-based business	Post-secondary education
IT support	High-end hotel	University degree
Lifeguard	Mid-tier hotel	Secondary education
Maintenance staff	High-end hotel	Post-secondary education
	Mid-tier hotel	Secondary education
Manager	Food and beverage	Post-secondary education
Marketing manager	Broad-based business	University degree
Spa therapist	High-end hotel	Post-secondary education
Tour operator	High-end hotel	Post-secondary education
Tourism resource team	High-end hotel	Post-secondary education
Trainer	High-end hotel	Post-secondary education

Source: Own data.

Note: No new occupations were expected to provide employment in the near future for the edutainment business. Formal education requirements represent the modal education requirement reported by firms in a given category.

Table B7: Minimum educational requirements for current occupations, horticulture firms

Occupation	Formal education requirement
Farm worker	No formal education
Horticulturist	Secondary education
Plant extractor	No formal education
Plant pathologist	University degree
Product developer	Postgraduate degree
Seed analyst	Post-secondary education

Source: Own data.

Table B8. Minimum educational requirements for current required occupations, agro-processing firms

Occupation	Formal education requirement
Factory workers	Secondary education
Food technician	University degree
General worker	Secondary education
Laboratory analyst	Post-secondary education
Machine operators	University degree
Office administrator	University degree
Section manager	Postgraduate degree
Supervisor	No formal education

Source: Own data.

Table B9. Minimum educational requirements for future required occupations, agro-processing firms

Occupation	Formal education requirement
Cashiers	Secondary education
Depot managers	Post-secondary education
Drivers (truck & forklift)	Secondary education
IT technician	University degree
Industrial relations clerk	Secondary education
Impact safety officer	Post-secondary education
Marketing and sales manager	University degree
Shop assistant	Secondary education

Source: Own data.

Table B10. Minimum educational requirements for current required occupations, logistics firms

Occupation	Formal education requirement
Administrator	Secondary education
Apprentice	Post-secondary education
Data capturer	Post-secondary education
Documentation assistant	Post-secondary education
Financial controller	Post-secondary education
Learner	Post-secondary education
Merchandiser	Post-secondary education
Operational assistant	Post-secondary education

Source: Own data.

B. Skill requirements by sector

Figure B1: Level and importance of soft and hard skills by occupation, tourism firms

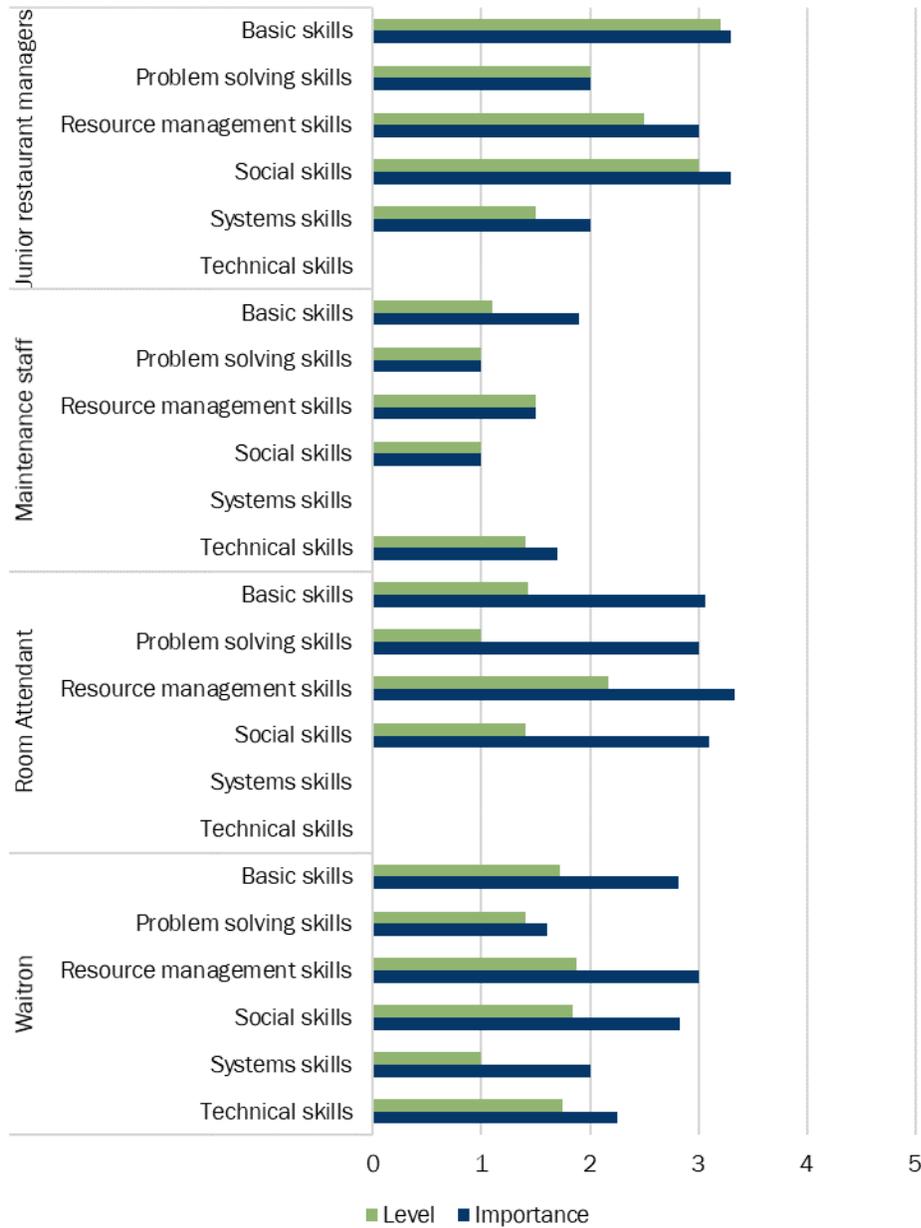
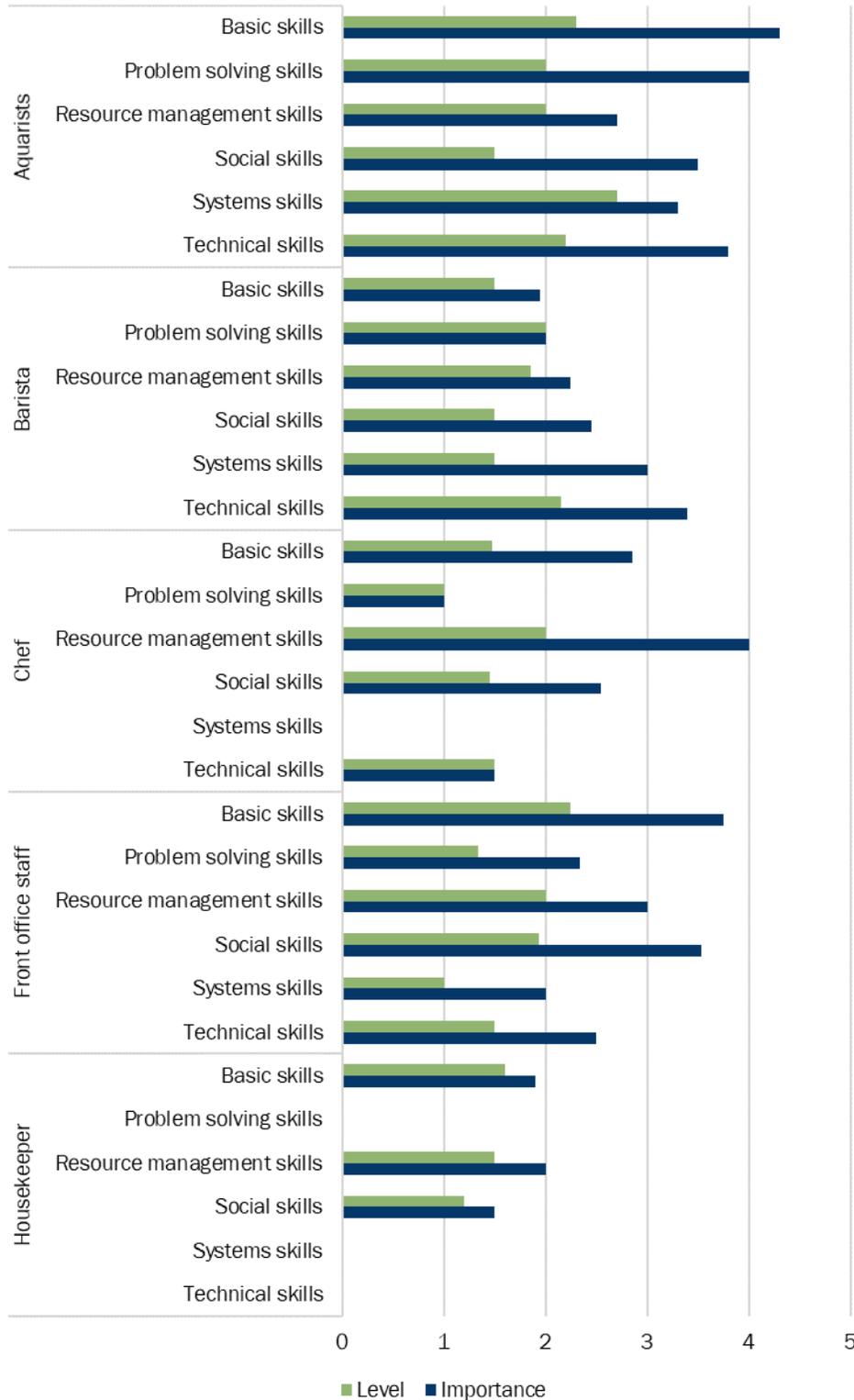
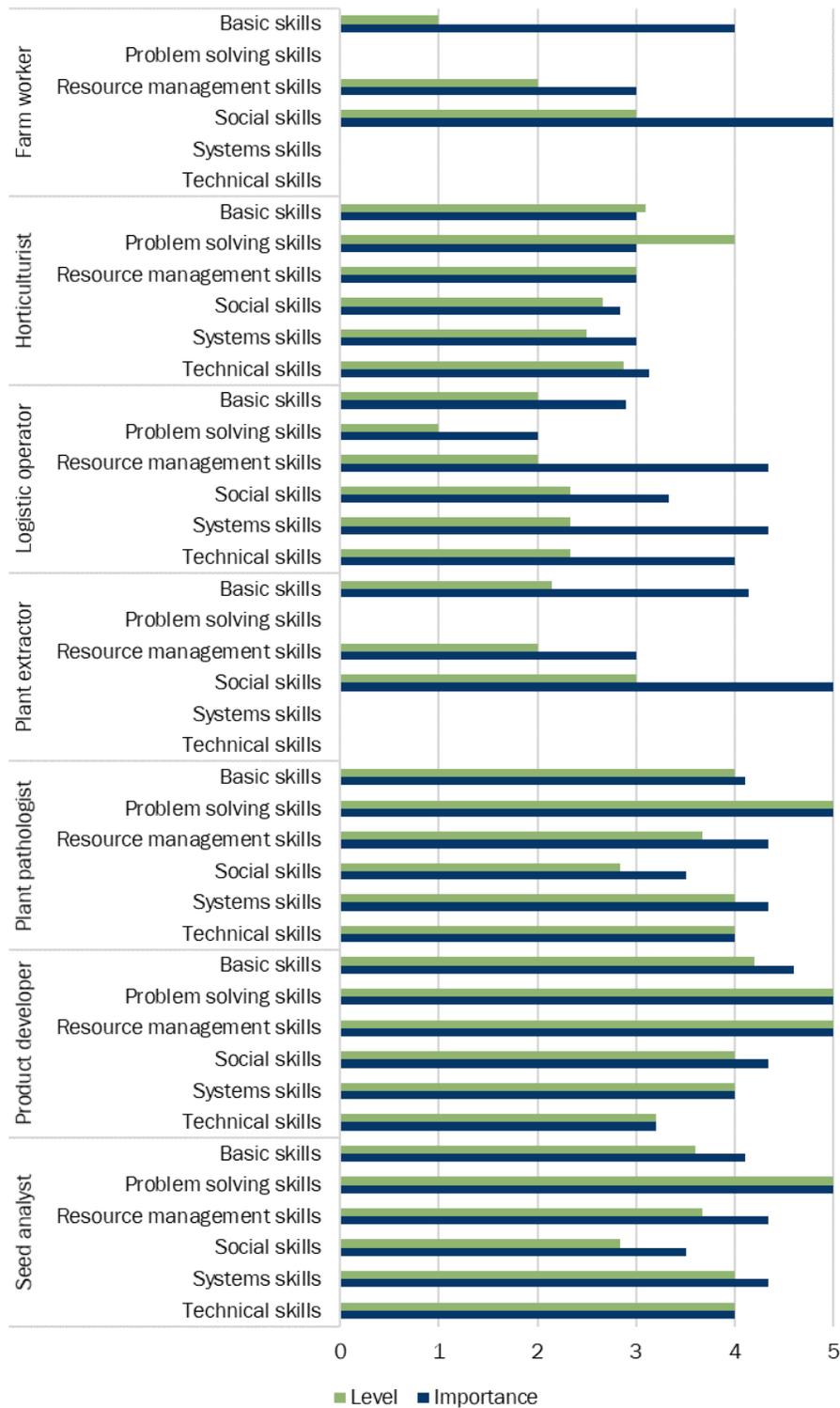


Figure B1: Level and importance of soft and hard skills by occupation, tourism firms (continued)



Notes: 1. No scores are recorded for skills that respondents did not think were relevant for an occupation.
 2. Where occupations across businesses were the same, a simple arithmetic average was taken.
 Source: Own data.

Figure B2. Level and importance of hard and soft skills by occupation, horticulture



Notes: 1. No scores are recorded for skills that respondents did not think were relevant for an occupation.
 2. Where occupations across businesses were the same, a simple arithmetic average was taken.
 Source: Own data.

Figure B3. Level and importance of soft skills by occupation, agro-processing

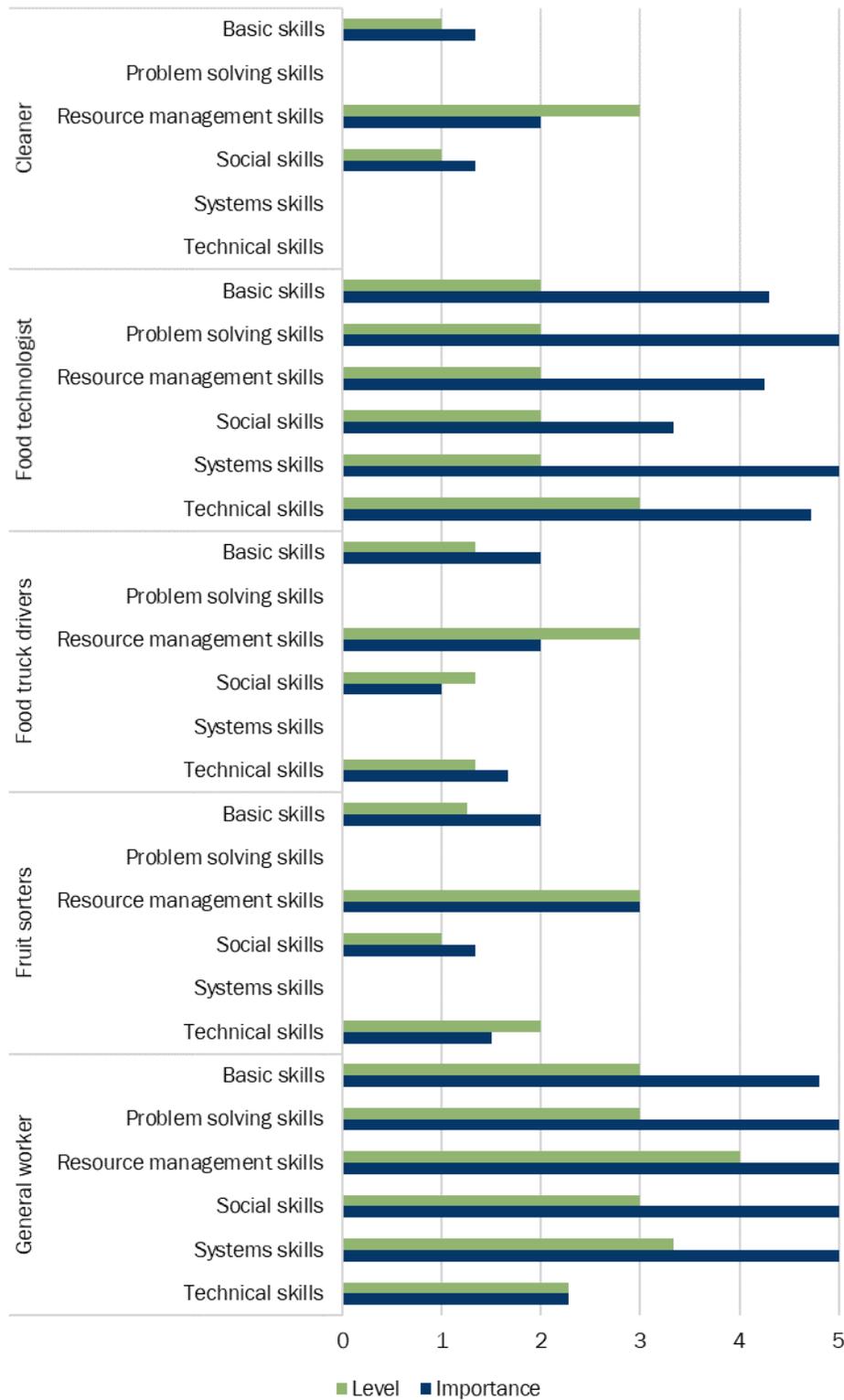
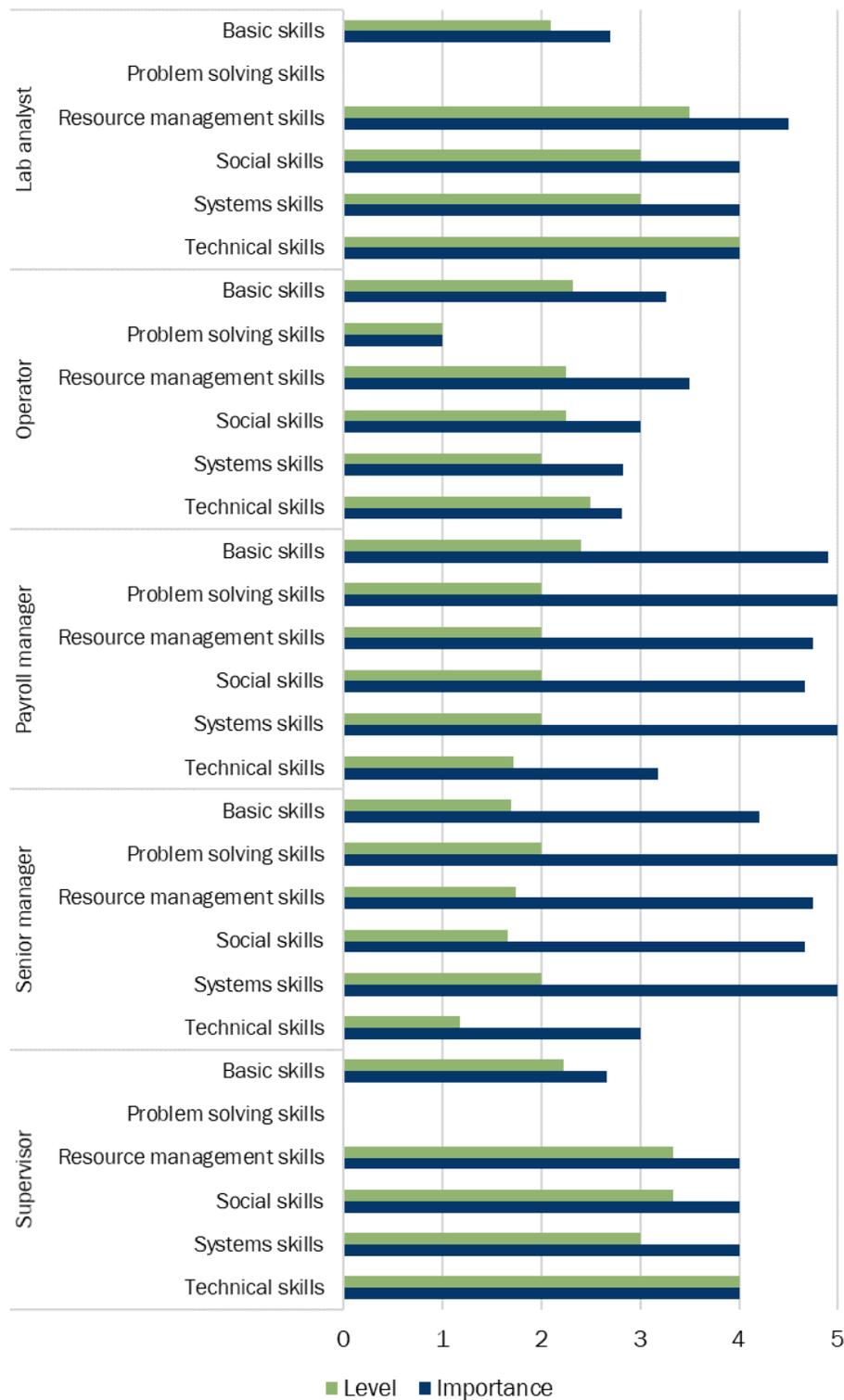


Figure B3. Level and importance of soft skills by occupation, agro-processing (continued)



Notes: 1. No scores are recorded for skills that respondents did not think were relevant for a occupation.
 2. Where occupations across businesses were the same, a simple arithmetic average was taken.
 Source: Own data.

Figure B4: Skill requirements, logistics

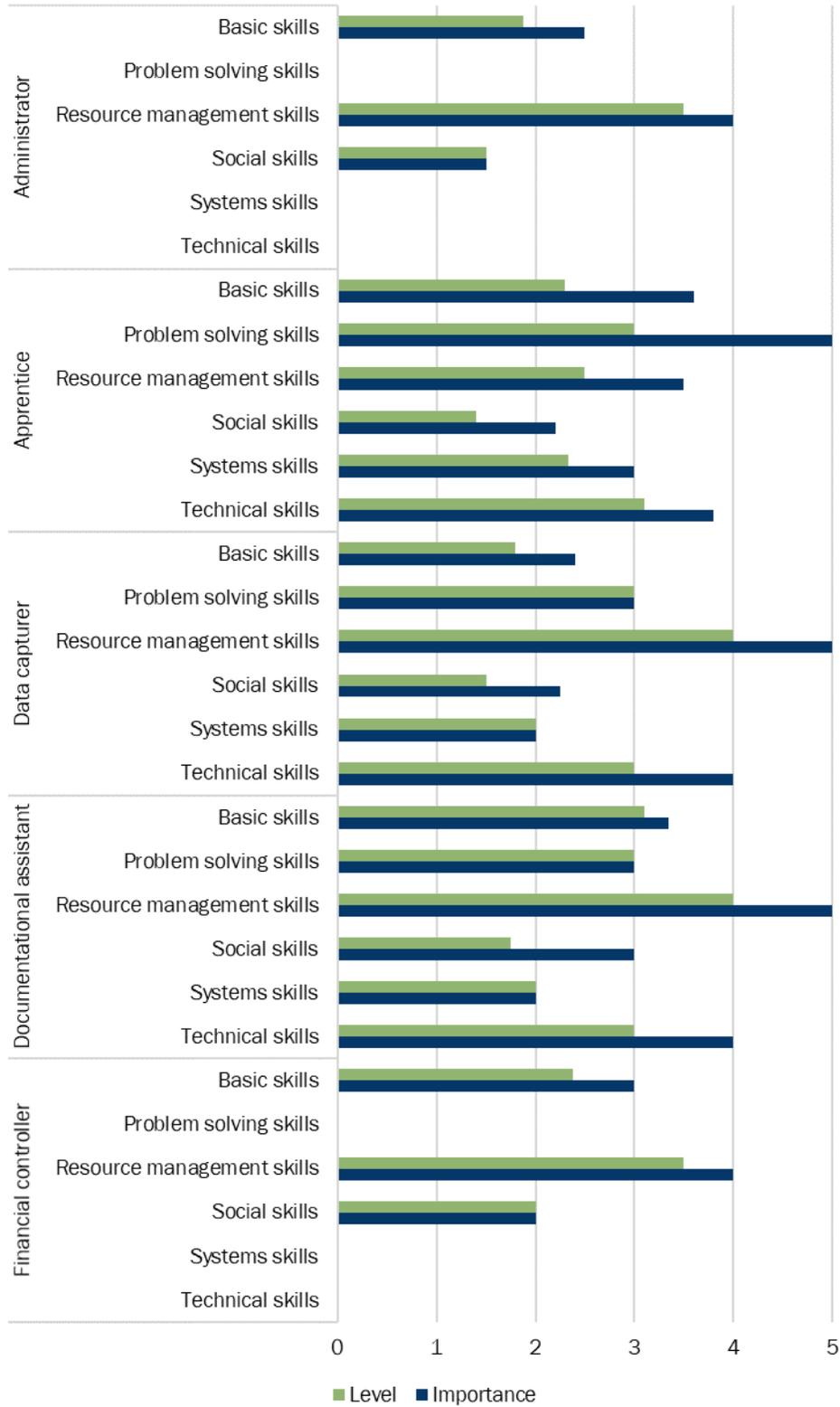
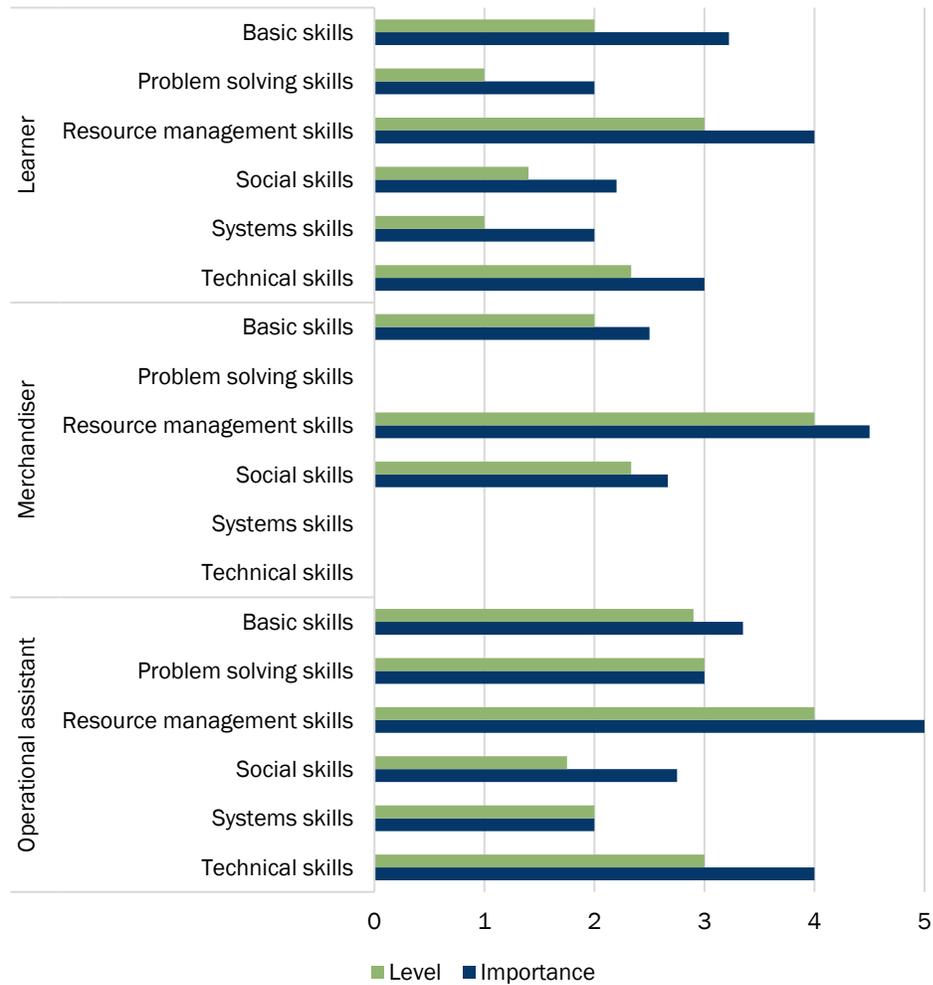


Figure B4: Skill requirements, logistics (continued)



Notes: 1. No scores are recorded for skills that respondents did not think were relevant for an occupation.
 2. Where occupations across businesses were the same, a simple arithmetic average was taken.
 Source: Own data.

Appendix C: Data collection instrument

Addressing Africa's Youth Unemployment through Industries without Smokestacks The South African Case Study

University of Cape Town, South Africa

September, 2019

Data Collection Instrument⁵⁰

Responses will be collected via a telephonic interview and firm visits

⁵⁰ Formatting of the original data collection instrument has been adjusted for space for reprint here.



I. Baseline Information

Name	
Industry	
Type of Business	
Number of Employees	

II. Global Value Chain Activities

What are the current work activities that you are undertaking?

Brief bullet points

III. Identifying Occupations in the Business

Questions are based on the three main occupations for youth (15-24 years) in your firm.

Post-secondary would be a certificate or diploma – anything that is not a degree or a higher diploma.

Occupation No.	Occupation (Job Title)	No. of employees
1		
2		
3		

Occupation No.	Pre-secondary	Secondary	Post-secondary	Degree	Post-graduate
1					

2					
3					

Occupation No.	Training period (days, weeks, months)
1	
2	
3	

IV. Identifying Skills in the Business

Do not press interviewees on importance and only question level if more than 1 point different from your expectations. Refer to excel spreadsheet for this question and ask about each skill for all three occupations before moving on to the next skill.

All questions are based on the three main occupations for youth (15-24 years) in your firm.

A. The following questions concern the skills that you feel are required for each occupation, and not those skills that your employees have:

Importance: 1 Not important – 5 Very important

Level: See appendix

If a skill does not apply leave the block blank

	Skill	Definition	Importance (1-5)	Level (1-5)
Basic Skills	Active Learning	Understanding the implications of new information for both current and future problem-solving and decision-making.		
	Active Listening	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.		
	Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.		
	Learning Strategies	Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things		
	Mathematics	Using mathematics to solve problems.		
	Monitoring	Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.		
	Reading Comprehension	Understanding written sentences and paragraphs in work related documents.		
	Science	Using scientific rules and methods to solve problems.		
	Speaking	Talking to others to convey information effectively		
	Writing	Communicating effectively in writing as appropriate for the needs of the audience.		

Social Skills	Coordination	Adjusting actions in relation to others' actions.		
	Instructing	Teaching others how to do something.		
	Negotiation	Bringing others together and trying to reconcile differences		
	Persuasion	Persuading others to change their minds or behavior		
	Service Orientation	Actively looking for ways to help people.		
	Social Perceptiveness	Being aware of others' reactions and understanding why they react as they do.		
Problem Solving	Complex Problem Solving	Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.		
Technical Skills	Equipment Maintenance	Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.		
	Equipment Selection	Determining the kind of tools and equipment needed to do a job.		
	Installation	Installing equipment, machines, wiring, or programs to meet specifications.		
	Operation and Control	Controlling operations of equipment or systems.		
	Operation Monitoring	Watching gauges, dials, or other indicators to make sure a machine is working properly.		
	Operations Analysis	Analysing needs and product requirements to create a design		
	Programming	Writing computer programs for various purposes		
	Quality Control Analysis	Conducting tests and inspections of products, services, or processes to evaluate quality or performance.		
	Repairing	Repairing machines or systems using the needed tools.		
	Technology Design	Generating or adapting equipment and technology to serve user needs.		
	Troubleshooting	Determining causes of operating errors and deciding what to do about it.		
Systems Skills	Judgement and Decision Making	Considering the relative costs and benefits of potential actions to choose the most appropriate one.		
	Systems Analysis	Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.		
	Systems Evaluation	Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.		
Resource Management	Management of Financial Resources	Determining how money will be spent to get the work done, and accounting for these expenditures.		
	Management of Material Resources	Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.		

	Management of Personnel Resources	Motivating, developing, and directing people as they work, identifying the best people for the job.		
	Time Management	Managing one's own time and the time of others.		

B. The following question concerns the differences between the skills that you have identified as being required for each occupation and the skills that your employees have:

Skill deficit: 1 Meets skill requirements – 5 Does not meet skill requirements at all

Skill category	Skill deficit (1-5)
Basic skills	
Social skills	
Problem solving skills	
Technical skills	
Systems skills	
Resource management skills	

C. Do any of the three main occupations identified require digital skills?

If yes, what type of digital skills are required (list activities requiring digital skills).

Brief bullet points

D. How do you foresee digital skills becoming more important in the future, especially with regards to the occupations we have discussed?

Brief bullet points

V. Future Occupational and Skill Needs

A. Turning to the plans for the future of the business: Based on the activities identified in Section II, do you have any plans to grow/expand your business in ...

1. the medium-term (next 5 years)?	Yes	No
If yes, what do these plans entail?		
2. the long-term (next 10 years)?	Yes	No

If yes, what do these plans entail?	
-------------------------------------	--

Enumerator note: The plans for growth and expansion need not be too detailed, as firms may not want to discuss their business plans openly. But short bullet points such as “Open more franchised restaurants”, or “Acquire new premises to expand current business operations” would be sufficient.

If “No” to both A1. and A2:

Why do you not plan on expanding your business in the future?

Short bullet point answers.

--

Only answer questions B to E if “Yes” to A1. and/or A2.

Consider the expansion path of your business in the medium-term (next 5 years):

B. Assume that your business’ expansion plans outlined above are realised. How would employment numbers for each of the three main identified occupations for youth be affected? In other words, how many more of each type of employee do you expect to hire in the next 5 years, and what would the required educational attainment level of these employees be?

Enumerator note: Table should be completed with numbers indicating the number of employees (or respondent’s best estimate) required in a given cell. If respondents **cannot** give numbers, the cell should simply be marked with an “X” to indicate that there will be individuals needed.

Occupation No.	Pre-secondary	Secondary	Post-secondary	Degree	Post-graduate	Total
1						
2						
3						

Consider the expansion path of your business in the long-term (next 10 years):

C. Assume that your business’ expansion plans outlined above are realised. How would employment numbers for each of the three main identified occupations be affected? In other words, how many more of each type of employee do you expect to hire in the next 10 years, and what would the required educational attainment level of these employees be?

Enumerator note: Table should be completed with numbers indicating the number of employees (or respondent’s best estimate) required in a given cell. If respondents **cannot** give numbers, the cell should simply be marked with an “X” to indicate that there will be individuals needed.

Occupation No.	Pre-secondary	Secondary	Post-secondary	Degree	Post-graduate	Total
1						
2						
3						

D. Still assuming that your business’ expansion plans outlined above are realised, do you expect there to be any **new** occupations created within your company that would provide employment opportunities to the youth? If so, what are the three main new occupations you can identify?

New Occupation No.	Description (if needed)
1	
2	
3	

E. What level of education would you expect the employees in these new occupations to have?

Enumerator note: New occupation Table should be completed with numbers indicating the number of employees (or respondent's best estimate) required in a given cell. If respondents **cannot** give numbers, the cell should simply be marked with an "X" to indicate that there will be individuals needed.

New Occupation No.	Pre-secondary	Secondary	Post-secondary	Degree	Post-graduate	Total
1						
2						
3						