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Skills Supply and Demand in South Africa

Labour Market Intelligence Programme

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Acronyms and abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial intelligence
AR	Augmented reality
ASGISA	Accelerated Shared Growth Initiative of South Africa
ATR	Annual Training Report
BACI	Base pour l'Analyse du Commerce International
CESM	Classification of Educational Subject Matter
CET	Community education and training
CHE	Council on Higher Education
CSP	Community, social, and personal services
CTLF	Clothing, textiles, leather, and footwear
DAFF	Department of Agriculture, Forestry, and Fisheries
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
DTI	Department of Trade and Industry
FTEN	First-time entering
GDP	Gross domestic product
GER	Gross enrolment ratio
GEAR	Growth, Employment, and Redistribution Strategy
GETC: ABET	General Education and Training Certificate: Adult Basic Education and Training
GFCI	Gross fixed capital investment
GVA	Gross value added
HE	Higher education
HEI	Higher education institution
HEMIS	Higher Education Management Information System
HP	Hodrick-Prescott
HRD-SA	Human Resource Development Strategy for South Africa
HSRC	Human Sciences Research Council
IFR	Institute for Futures Research
ILO	International Labour Organisation
ILOSTAT	International Labour Organisation Database
INSETA	Insurance Sector Education and Training Authority
IoT	Internet of things
IPAP	Industrial Policy Action Plan

ISCED	International Standard Classification of Education
LFPR	Labour force participation rate
LFS	Labour Force Survey
LMIP	Labour Market Intelligence Partnership
NC(V)	National Certificate (Vocational)
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NEET	Not in employment, education, or training
NEETs	Individuals who are not in employment, education, or training
NIPF	National Industrial Policy Framework
NPPSET	National Plan for Post-School Education and Training
NQF	National Qualifications Framework
NSC	National Senior Certificate
NSDP	National Skills Development Plan
NSDS	National Skill Development Strategy
O*NET	Occupational Information Network
OECD	Organisation for Economic Co-Operation and Development
OFO	Organising Framework of Occupations
PIVOTAL	Professional, vocational, technical, and academic learning
PSET	Post-school education and training
PSP	Priority Skills Plan
QLFS	Quarterly Labour Force Survey
RDP	Reconstruction and Development Programme
SARB	South African Reserve Bank
SET	Science, engineering, and technology
SETA	Sector Education and Training Authority
SONA	State of the Nation Address
Stats SA	Statistics South Africa
STEM	Science, technology, engineering, and mathematics
TETA	Transport Education and Training Authority
TIMMS	Trends in Mathematics and Science Study
TVET	Technical and vocational education and training
UKCES	United Kingdom Commission for Employment and Skills
UNISA	University of South Africa
WEF	World Economic Forum
WPPSET	White Paper for Post-School Education and Training
WSP	Workplace skills planning

Foreword by the Director-General

It is generally well known that South Africa is experiencing significant imbalances between the supply of and demand for skills. Previous research has shown that there is growing demand for people with high-level skills, while the majority of the population possess low-level skills. In addition, many people in South Africa are either overqualified or underqualified for their current jobs. The research reveals notable mismatches between the field in which workers are employed and the field of study in which they are qualified. In some instances, workers' level of education is not aligned with the educational qualification required by their job.

The Department of Higher Education and Training has initiated a five-year research programme on labour market intelligence (the Labour Market Intelligence Programme). This is the second phase of the programme, implemented in partnership with the University of Cape Town. Through the programme, the Department monitors the imbalances between the demand for and the supply of skills, with a view to being as responsive to the needs of the labour market as possible.

To this end, it is my pleasure to present to you the third edition of the *Skills Supply and Demand in South Africa* report. The report is aimed at supporting skills planning by providing insights into the labour market. Within the Department, the evidence emanating from the report is being used to strengthen enrolment planning at our post-school education and training institutions via improved career information services. It is also being used to guide resource allocation (as in the case of the National Skills Fund), to guide uptake of international scholarships, and to guide the prioritisation of qualifications development (as in the case of the Quality Council for Trades and Occupations).

It is hoped that our stakeholders will use this report as a reference on matters pertaining to skills planning and the provision of education and training. Your feedback, including suggestions for improvement, can be emailed to Khuluvhe.M@dhet.gov.za.

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Pretoria, South Africa

Executive summary

This report provides a holistic overview of the supply of and demand for skills in South Africa, with the aim of informing future skills policy and supporting an inclusive economic growth path. Through careful analysis, the report attempts to understand the complexities and intricacies surrounding how supply and demand interact and the corresponding implications for reform.

The report largely uses data for the Q2 2009–Q2 2019 period from the Statistics South Africa (Stats SA) Quarterly Labour Force Surveys and data for the 2011–2017 period from the Department of Higher Education and Training (DHET). It also makes use of other sources, where appropriate, to supplement its analysis. Investigating both the demand for and supply of skills involved an exploration of the state of the economy, the characteristics of the employed and unemployed individuals who make up the labour force, trends in the sectoral and occupational distributions of employment, and trends in the post-school education and training (PSET) system. The interaction between supply and demand provides the basis for identifying signals regarding the nature and extent of the skills imbalances facing South Africa. By understanding these imbalances, it is possible to steer supply, guiding future investment and interventions and, ultimately, ensuring that the PSET system supports an inclusive skills development path.

Key trends in skills supply and demand in South Africa

- Economic growth has been poor in South Africa over the past decade. This has led to poor employment growth, which has been inadequate to absorb an increased labour force. In order to have absorbed all labour market entrants between Q2 2009 and Q2 2019, employment should have increased by 30 percent over the period. The employment absorption rate for the period was, however, 46 percent, with employment only growing by 13.6 percent. The result has been an increased unemployment rate.
- There is an overarching structural imbalance between labour demand and labour supply. Economic growth has favoured medium- and high-skilled workers, despite the fact that the majority of the labour force have low skill levels.
- The South African labour force was made up of 16.3 million employed and 6.7 million unemployed people in Q2 2019. The number of unemployed people rises to 10.2 million when the non-searching unemployed are considered as well. 75.1 percent of the employed and 89.4 percent of the unemployed are from the black African population group. Women account for 43.7 percent of the employed and 48.8 percent of the unemployed. The highest rate of unemployment is observed among South African youth (those aged between 15 and 34), at 41.1 percent. This rate has risen as more young people have joined the labour force.
- In Q2 2019, there were 8.2 million South African youth not in employment, education, or training (NEET), an increase from 7.5 million in Q2 2013. Relative to other BRICS countries, South Africa has the highest rate of individuals between the ages of 15 and 24 who are NEET, at 32.6 percent. The NEET rate for those aged between 25 and 34 was even higher, at 48.5 percent. The NEET rate was highest for individuals with primary or lower education (55.3 percent) and for those with incomplete secondary schooling (43.2 percent). These individuals are of particular concern: they remain disconnected from the country's formal economy, given that they are low-skilled, not engaged in employment, and not developing their skills to improve their employment prospects.
- The education levels of the labour force increased on average between Q2 2009 and Q2 2019. However, the average level of educational attainment remains low. Among the employed, 9.1 percent

have a higher education (HE) qualification, 12.4 percent have a technical and vocational education and training (TVET) qualification, and 32.8 percent have completed secondary schooling. Over two-fifths of the employed (44.4 percent) have not completed secondary schooling. This amounts to 7.2 million individuals, as of Q2 2019.

- A concerning trend is the rising unemployment rates among even those with HE and TVET qualifications. Unemployment among individuals with HE qualifications increased at an annual average rate of 14.4 percent per year between Q2 2013 and Q2 2019, while unemployment among individuals with TVET qualifications grew at an average rate of 10 percent per year over the same period. These increases are troubling and suggest that, on the whole, there is insufficient demand for individuals with HE and TVET qualifications in the economy. They indicate that the specific qualifications attained by individuals are not in demand, or else that the skills obtained through these qualifications are not aligned with the skills needs of employers.
- By rate of increase, growth in unemployment among individuals with HE qualifications has been highest for those with health, education, other humanities, and engineering qualifications. For individuals with TVET qualifications, those with business and engineering qualifications have seen the greatest increase in unemployment.
- There has been a structural shift towards a service economy, with community, social, and personal (CSP) services and financial and business services dominating and experiencing the highest rates of growth. These industries are more intensive in medium- and high-skilled labour than in low-skilled labour.
- Between Q2 2009 and Q2 2019, there were considerable increases in employment for the following occupations: service and sales workers (an increase in employment of 769 000 jobs, with close to all of this increase accounted for by increased demand in the tertiary sector), elementary workers (an increase of 644 400 jobs, with this increased employment coming from different sectors), managers (an increase of 422 100 jobs, driven mainly by the tertiary sector), clerks (an increase of 170 900 jobs, driven by increased employment in the tertiary sector), and skilled professionals (an increase of 129 700 jobs, driven by increased employment in the tertiary sector, particularly in CSP services).
- In terms of highest level of educational attainment, there has been an increase in the number of individuals employed with incomplete secondary schooling, completed secondary schooling, certificates or diplomas, and degrees. The rate of increase has, however, been highest for individuals with degrees. Overall, it is clear that, across the secondary and tertiary sectors, there has been significant increased demand for individuals with degrees and a decline in the relative share of employment for individuals with incomplete schooling. In the primary sector, conversely, the share of individuals employed with degrees has declined slightly, while employment of individuals with incomplete schooling still accounts for close to three-quarters of all employment in this sector. It is also the case that the increased demand for individuals with degrees has not been sufficient to absorb the growing number of job seekers graduating from universities, resulting in rising unemployment for degree holders.
- Within the tertiary sector, there was a clear increase in the absorption of individuals with HE qualifications across all fields of study (except arts) between Q2 2009 and Q2 2019. For individuals with TVET qualifications, however, this trend was not observed. The tertiary sector, while dominant and expanding, seems to offer muted demand for TVET qualifications, except those in the business and health fields.
- The inadequate quality of basic education remains a critical constraint on the education and training system and the labour market. Of all the learners who start school, only about 60 percent write their matric examinations 12 years later. For the 2008 matric cohort, the pass rate was 63 percent. However, taking into account that only approximately 60 percent of the learners who started school

12 years earlier wrote the matric examination, the proportion of learners who passed matric in 2008 was only 38 percent. Thus, only 12 percent of the original 2008 matric cohort who started school 12 years prior would go on to access HE, only 2 percent would go on to complete an undergraduate diploma, and only 4 percent would go on to complete an undergraduate degree within six years of matriculating.

- In 2017, there were 1.2 million students enrolled at higher education institutions (HEIs). Undergraduate degree enrolments made up 53.6 percent of the total enrolments at public universities in 2017. Between 2011 and 2017, undergraduate enrolments grew at an average rate of 2.6 percent per year. Enrolments in postgraduate degrees below master's level increased at an average rate of 2.8 percent each year, and enrolments in master's degrees grew at 3.2 percent per year, on average. The growth in PhD enrolments over this period was 9.9 percent per year.
- Enrolments at TVET and private colleges increased significantly between 2011 and 2017. TVET enrolments increased, on average, by 9.4 percent per year, from 400 273 to 688 082, over the 2011–2017 period, with this growth driven by enrolments in Report 191 (N1–6) programmes (certificates and diplomas).
- While access to schools, HEIs, and TVET colleges has improved, concerns remain about the quality of education. There are low progression rates through programmes across all types of educational institutions, as well as low completion rates for individuals enrolled at schools, HEIs, and TVET colleges.
- While throughput rates appear to be rising in HEIs, it remains worrying that large numbers of students still take much longer than the specified three years to complete their undergraduate degrees. For example, only 55.8 percent of the cohort that entered public universities in 2010 had completed their undergraduate degrees after six years – twice the expected duration of a three-year degree.
- The number of public university students graduating with undergraduate degrees increased from 64 551 in 2011 to 96 120 in 2017, constituting an average annual growth rate of 6.9 percent. The number of students graduating with postgraduate degrees below master's level grew at an average rate of 5.3 percent over the same period, and the number of students graduating with master's degrees grew by 5.0 percent per year. The number of students graduating with doctoral degrees grew the fastest, at an average rate of 11.7 percent per year, although this is off a relatively low base.
- The number of black African students graduating from public universities has increased. However, there are significant racial differences in graduation rates. While graduation rates among all population groups increased between 2011 and 2017, the graduation rate of white students remained higher than that of other population groups. The graduation rate of Indian students grew the fastest over this period, at an average annual rate of 4.8 percent.
- The Organisation for Economic Co-operation and Development (OECD) has noted that there are considerable occupational shortages in South Africa, with higher-skilled occupations marked by a higher proportion of shortages. The share of occupational shortages across occupational groups ranges from 17 percent for elementary occupations to over 80 percent for managers. For those occupations marked by shortages, the lack of individual skills competencies was shown to be particularly acute for reading comprehension, active listening, speaking, and writing. Monitoring, learning strategy, critical thinking, and active learning skills were also found to be in short supply.
- With respect to the employment mismatch of qualified individuals, there is a considerable share of individuals with HE qualifications employed in occupations that are not appropriate for individuals who are high-skilled. Conversely, only 4.7 percent of the TVET-qualified employed were in low-skilled occupations in Q2 2019, suggesting that most were employed in appropriate occupations. The extent of employment mismatch varies across different fields, however. A large number of individuals with business qualifications from TVET colleges (around one in four) are employed in occupations that are not explicitly business-related.

Key recommendations from the analysis of skills supply and demand

The recommendations outlined in this section take into account the challenges of economic growth and inclusive development in South Africa. They recognise that skills planning should focus not only on those in the workplace but also on the unemployed and those who are most vulnerable in society. The latter category includes youth, low-skilled people, women, and those in precarious forms of employment. Policy should respond to diverse levels of skills development and occupational pathways and should effectively allocate resources in a manner that targets inclusive development. The following key recommendations are made:

1 Integrate skills development and economic growth policies and improve co-ordination between different government departments.

While the responsibility of the DHET and its stakeholders lies firmly on the supply side, recognising that supply must respond to demand – and that demand and supply interact to produce the labour market outcomes observed in the country – confirms the critical role of economic growth in addressing the crisis of unemployment within the system of skills demand and supply. Specifically, the economy should move towards growth that can absorb the large number of people in search of jobs. To the extent that the country pursues growth in sectors that require higher-skilled labour, this growth should be unlocked and amplified through appropriate interventions. It should be ensured that those in the labour force obtain skills that are aligned with the country's growth trajectory. Skills development and education should be considered explicitly and in a targeted manner within growth plans and strategies. There is a need for a standardised and consistent approach that not only targets growth but also takes into account the skills requirements and implications of such strategies.

2 Improve the overall skills levels of the population.

The quality of basic education should be improved to support the PSET system and foster the skills required in the economy. The large number of individuals who are not in employment, education, or training (NEETs) is symptomatic of a schooling system that fails to adequately prepare learners for further education or a lacklustre labour market. Without improvements in schooling outcomes, there will continue to be a limited pool of potential students eligible for PSET. For those who currently are not eligible for PSET, the reach and capacity of community education and training (CET) programmes should be expanded, so that the basic skills levels of the population can be increased. In improving skills levels, it is also important to ensure that curricula allow students to develop competencies in emerging and in-demand areas. In particular, in order for the South African economy to cope with changes in the demand for certain skills as a result of the Fourth Industrial Revolution (4IR), a number of supply-side interventions are required, especially in relation to post-secondary education. These include adapting subject curricula in order to ensure that students develop competencies in emerging areas, such as data science, artificial intelligence (AI), and robotics. Finally, a culture of lifelong learning should be encouraged. Institutions can facilitate lifelong learning by developing relevant online courses, for example. Although online courses do exist in South Africa, the current choices on offer are limited. There is plenty of scope to improve the acquisition of skills through online and distance learning.

3 Support the acquisition of skills required for in-demand occupations.

Qualifications for which there is greater demand should be better targeted. While unemployment has risen among graduates in all fields, unemployment has risen much faster in some fields compared to others. Individuals should be encouraged to obtain qualifications in fields in which there are more opportunities for employment. These include business and science. In view of the overall increase in unemployment among individuals with qualifications in all fields of study, however, in the long term demand for all qualifications should be raised through appropriate growth initiatives. The skills levels of individuals already employed in occupations in high demand should also be supported, given the importance of these skills in the economy. Across occupational groups, demand for managers and professionals is among the fastest growing. This demand is driven mainly by the dominant financial and business services and CSP services industries. Effective managers and skilled professionals are created not only through appropriate qualifications but equally through development in the workplace. Sector Education and Training Authorities (SETAs), which can facilitate continual learning for managers and skilled professionals in the workplace, have a particular role to play in this regard.

4 Improve the placement and employment of individuals with qualifications.

Unemployment among HE and TVET graduates has been rising. The placement and employment of individuals with HE and TVET qualifications should be improved through a demand-led approach to the attainment of qualifications that facilitates and supports collaboration between employers and HEIs. Employers should be involved in ensuring that qualification curricula and career pathways are informed by work and skills requirements, so that individuals obtain qualifications with a clear path towards productive and appropriate employment. Similarly, the active involvement of businesses in devising training and skills should be facilitated. Importantly, because skills needs differ across sectors, businesses across all sectors should be engaged to make sure that students obtain qualifications aligned to the varied skills requirements of the economy. In particular, HEIs and TVET colleges must adapt to the 4IR and other macro-level changes by allowing greater input from businesses, which will be at the forefront of these changes.

5 Strengthen the availability of data for labour market intelligence.

A multi-year programme of regular surveys should be established to probe issues surrounding labour and skills supply and demand, with a particular emphasis on closing some of the knowledge gaps on the demand side. These surveys need to be institutionalised so that there is clear responsibility for ensuring that they are conducted. In this regard, the DHET must work closely with Stats SA and other relevant government departments to collect data for skills planning, using their administrative data sets. This data should be made freely available to the research community for further analysis.

Glossary of terms and concepts

Labour market concepts

Working-age population: The working-age population is defined as all individuals between the ages of 15 and 64 years.

Employed: Individuals of working age are considered by Statistics South Africa (Stats SA, 2008, pp. 8–9) to be employed if, for at least one hour during a survey's reference week, they worked for a cash or in-kind payment; ran a business, irrespective of size, alone or with partners; helped without pay in a business operated by a household member; or were temporarily absent from a job or business. The employed population therefore include employees, the self-employed, employers, and unpaid family workers. It is also referred to as 'the workforce'.

Unemployed: Working-age individuals who were not employed in a survey's reference week, but who were willing, able, and available to work, are defined by Stats SA as unemployed. The official (narrow) definition of unemployment defines the unemployed as those who were not employed in the reference week but who actively sought employment or tried to start a business during the four weeks prior to the survey and who would have been able to start work or a business during the reference week (Stats SA, 2008, p. 8). The expanded definition of unemployment uses the same criteria except that it does not require that the unemployed actively seek work or try to start a business in the four-week reference period.

Labour force: The labour force consists of all working-age individuals who are either employed or unemployed. Since there are two definitions of unemployment, there are two definitions of the labour force. The narrow labour force consists of the employed and the narrowly defined unemployed; the expanded labour force consists of the employed and the broadly defined unemployed.

Economically active: The economically active population is synonymous with the labour force. Individuals of working age who are not members of the labour force are not economically active.

Non-searching unemployed: According to Stats SA, the non-searching unemployed are unemployed individuals who did not actively seek employment or try to start a business during the four weeks prior to a survey. In other words, the non-searching unemployed are those individuals who are unemployed according to the expanded definition of unemployment but who are not economically active according to the narrow definition of unemployment. Conventionally, the non-searching unemployed are referred to as 'discouraged workseekers'. However, Stats SA has recently begun defining discouraged workseekers as a subgroup of the non-searching unemployed.

Labour force participation rate: The proportion of the working-age population who are members of the labour force (i.e., who are either employed or unemployed) is known as the labour force participation rate. Given the two definitions of unemployment, it is possible to calculate the corresponding narrow and expanded labour force participation rates.

Unemployment rate: The unemployment rate refers to the proportion of the labour force that is unemployed. It is possible to calculate a narrow unemployment rate and an expanded unemployment rate based on the two definitions of unemployment.

Skills concepts

Skills: In a skills planning context, skills are "all types and facets of competencies required by workers to perform their jobs" (OECD, 2017). The term may, however, be used in different contexts to refer to competencies, educational attainment or qualifications, or occupations. In some contexts, skills refer to job competencies, such as communication, literacy, or numeracy. Competencies that are required in the workforce, but that may not be adequately represented in the current skills profile of the workforce, are labelled 'critical skills', 'top-up skills', or 'skills gaps' in the South African discourse. Skills may be thought of in terms of educational attainment, such as Grade 12 or a degree, or in terms of qualifications, such as a National Senior Certificate, an MSc degree, or a diploma in nursing. Finally, skills may be conceptualised in terms of occupations – for example, electrician, nurse, or civil engineer – when considering high- or low-skilled occupations or occupations in high demand. In this document, the term 'skills' is primarily used to refer to qualifications or educational attainment. Where appropriate, however, it will also be used to refer to job competencies or occupations.

Skills planning: Owing to its numerous dimensions and extensive scope of activities, the term 'skills planning' means different things to different people. At one end of the continuum, skills planning is about the *identification* of skills needs through research, analysis, and social dialogue. On the other end, it is about the *use* of labour market intelligence and data about skills needs for practical planning and action, which may include the allocation of resources and interventions to address skills demand, shortages, and imbalances, both currently and as anticipated in the future.

Skills demand: Skills demand refers to the human resources (in this instance, people) and competencies that employers require, at prevailing wage rates, to meet their operational needs at a given point in time. In this sense, the demand for skills derives from the demand for the goods and services produced by employers. Skills demand therefore reflects the skills that public and private sector employers need in order to meet their objectives. Skills demand can also be thought of as skills needs.

Skills supply: Skills supply consists of the skills – as represented by any appropriate conceptualisation of skills – possessed by individuals who are either working (the employed) or willing, able, and available to work (the unemployed). In other words, skills supply consists of the skills possessed by the labour force. Skills supply is influenced by various factors, including individuals' decisions to participate in the labour force, to learn new skills, and to migrate. In this context, it is important to understand the pipeline of skills acquisition: the various components of the education and training system and how they facilitate the acquisition of new skills, qualifications, and competences. A full picture of skills supply must therefore include a consideration of both the skills of the current labour force and those of the future labour force (which includes those individuals currently acquiring skills but not yet in the labour force). It may also include a consideration of the effect on skills supply of changes in labour force participation and migration.

Skills imbalances: Skills imbalances arise when the skills demanded by employers and the skills supplied by individuals in the labour market are not aligned. Types of imbalances include skills shortages, skills surpluses, skills gaps, and skills mismatches.

Skills shortages: Skills shortages arise when employers require human resources that are not supplied in sufficient quantities by individuals in the labour market. Skills shortages may manifest as an inadequate number of workers in particular occupations, and they are associated with hard-to-fill vacancies, wherein jobs cannot be filled due to a lack of individuals with appropriate skills in the labour force.

Skills surplus: Skills surpluses occur when the supply of skills in the labour force exceeds the demand for those skills. A skills surplus may be identified through high unemployment rates among individuals possessing a specific skill.

Skills mismatch: A skills mismatch may occur when the skills supplied by an individual do not match demand exactly but are sufficiently close for employers to hire the worker. Skills mismatches can refer either to the inadequacy of a worker's skills relative to the requirements of a job (e.g., having a lower level of qualification than that required for the job or being trained in a field of study other than that generally required for the job) or to a situation in which a worker's skills exceed the requirements of a job (e.g., having a higher level of qualification than that required for the job). A skills mismatch can take one of three forms: a skills gap, a qualification mismatch, or a field-of-study mismatch.

Skills gap: A skills gap refers to a situation in which a worker lacks a particular skill required for a job.

Qualification mismatch: A qualification mismatch may result when a worker's level of education is not in line with the educational qualification required for a job.

Field-of-study mismatch: A field-of-study mismatch occurs when a worker is employed in a field that differs from the field in which the worker is qualified.

PART 1

Introduction

Skills planning in South Africa is a complex process that directly influences many of the country's developmental objectives. In the face of pressing socio-economic challenges, optimal skills planning should co-ordinate several distinct priorities, including promoting economic growth and facilitating transformation, as well as reducing unemployment, poverty, and inequality. While there have been considerable efforts to plan for skills needs in South Africa since 1994, sustained skills imbalances reflect the need for a co-ordinated, coherent, and responsive skills planning system informed by evidence.

In 2009, skills planning was prioritised as a government priority in the form of Output 5.1, the "establish[ment of] a credible institutional mechanism for skills planning" (DHET, 2010), in turn derived from Delivery Agreement 1 Outcome 5, "a skilled and capable workforce to support an inclusive growth path" (DHET, 2010). To meet the Output 5.1 objectives, the Department of Higher Education and Training (DHET) initiated a consortium, led by the Human Sciences Research Council (HSRC), that established the Labour Market Intelligence Partnership (LMIP). In its first phase, the LMIP conducted numerous research studies and produced a series of research reports, with a view to informing skills planning in South Africa.

This third edition of the *Skills Supply and Demand in South Africa* report forms part of the second phase of the LMIP. It aims to provide a holistic overview of the supply of and demand for skills in South Africa by analysing the key signals of supply and demand and the interaction between supply and demand. Its insights can be used to inform skills planning and support inclusive economic growth.

1.1. Understanding skills supply and demand: Policy imperatives

Since 1994, several policy initiatives related to skills development have been pursued by the government. Overarching government strategies with a skills development focus have included the Reconstruction and Development Programme (RDP), the Growth, Employment, and Redistribution Strategy (GEAR), and the Accelerated Shared Growth Initiative of South Africa (ASGISA). In 2001, the first Human Resource Development Strategy for South Africa (HRD-SA) was launched, with the aim of aligning and co-ordinating the human resource development strategies of government, civil society, organised business, labour, professional bodies, and the research community. Among the pillars of the strategy were objectives related to education provision, private sector investment in training, the promotion of employment growth in emerging industries, and data capturing and analysis. The second HRD-SA (HRD-SA II), outlining a strategy for the period 2010–2030, was approved in 2009.

The National Skills Development Strategy (NSDS) is an overarching strategic instrument for skills development that broadly aims to develop the skills needed for social development and sustainable economic growth. The NSDS has had three phases. NSDS I, covering the period 2001–2005, focused on equality and the need to cultivate lifelong learning in the workplace setting. NSDS II covered the period 2005–2010 and had a focus on equity, quality training, and skills development in the workplace. NSDS III, which covered the period 2011–2016, was released with the primary purpose of improving the effectiveness and efficiency of the skills development system. NSDS III was extended beyond 2016 and, together with the current Sector Education and Training Authority (SETA) landscape system, is due to expire in March 2020. NSDS III asserts that there is currently no credible institutional mechanism that provides reliable information and analysis with regard to the supply of and demand for skills. It states that, while there are several disparate information databases and research initiatives, no standardised framework exists to monitor skills supply, shortages, and vacancies, and there is also no integrated information system for skills supply and demand across government. The NSDS III further asserts that information and data about skills supply and demand are essential in planning to meet the country's needs and guiding investment in the provision of education and training.

The New Growth Path (2010) strategy emphasises the importance of micro- and macroeconomic policies in maximising decent work opportunity creation and supporting labour-absorbing activities through the improvement of skills in every job. The strategy sets quantitative targets for meeting skills shortfalls in important economic sectors and underscores the central role of SETAs in the successful implementation of effective skills development initiatives. Since most jobs generated by strongly labour-absorbing activities are low-skilled in nature, and since a substantial segment of the South African labour force is low-skilled, the strategy asserts that an increase in employment in labour-intensive activities can serve as an effective tool to alleviate unemployment.

The National Development Plan (NDP) 2030 was launched in 2012. It provides a long-term strategic development plan for South Africa. The strategy identifies the improvement of the quality of skills as critical to the achievement of its objectives. The plan sets out South Africa's economic priorities and highlights the actions that must collaboratively be taken by government, the private sector, and labour to address job and economic challenges. The key industries of the economy, including agriculture, mining, tourism, manufacturing, and high-level services, are identified by the plan as major drivers of employment. The plan also indicates that, historically, the highest employment growth has been through the services sector. This key finding provides the basis for the rationale of aligning skills development to plans for investment in industrial sector strategies and of addressing the challenges faced by SETAs in conducting work on skills planning.

The White Paper for Post-School Education and Training (WPPSET), approved in November 2013, defines the priorities of the DHET in terms of building and strengthening the post-school education and training (PSET) system. With specific reference to labour market intelligence, the WPPSET (2013, p. 56) observes that, although South Africa has put in place a range of ambitious measures to improve skills planning, "the system neither produced good information about skills needs, nor increased the quality of provision in areas needed in the economy". The WPPSET concludes that the limited credibility and impact of the current sector skills planning system is the result of inadequate research capacity; a lack of economics, labour market, and industry expertise; poor data management; and a lack of planning. The document envisages the establishment of a Skills Planning Unit as a means of addressing the problems in identifying and analysing skills supply and demand and promoting responsiveness to identified skills needs. The WPPSET (2013, p. 58) therefore commits the Department to establishing a central unit for skills planning as part of its vision of "building an expanded, effective and integrated post-school system" for the country.

The WPPSET (2013, p. vii) also directs the Department to "elaborate a concrete development plan for the period up to 2030". The National Plan for Post-School Education and Training (NPPSET) (DHET, 2017a) fulfils this directive. The NPPSET operationalises the vision and principles of the WPPSET and provides a blueprint for growing an effective and integrated PSET system. Specifically, the NPPSET responds to the following challenges highlighted by the WPPSET:

- Limited PSET provision;
- Skewed and insufficiently diverse PSET provision;
- Weak quality in many parts of the system: high repetition and dropout rates;
- Weak linkages and the workplace: insufficient employer involvement in training;
- Weak and poorly integrated data systems; and
- Weak quality assurances.

These challenges, it notes, must be understood within the context of, and indeed are intensified by, the structural challenges of unemployment, poverty, and inequality. The WPPSET outlines the following policy directions:

- A transformed, non-discriminatory, equal opportunity, youth-responsive PSET system;
- An expanded, diverse, differentiated, fit-for-purpose PSET system;
- An articulated PSET system;
- An accessible and successful PSET system; and
- A PSET system that is strongly linked to the world of work.

The role of the NPPSET is to translate these policy directions into concrete actions. It identifies specific goals, objectives, and outcomes for PSET, setting out an implementation plan for 2019–2030. The overall goal is that, by 2030, the PSET system will be a socially just, responsive, and well-co-ordinated system, providing access to a diversity of quality education and training opportunities, wherein students have a reasonable opportunity to achieve success, and with vastly improved links between education and the world of work.

The National Skills Development Plan (NSDP) was gazetted in March 2019. The NSDP articulates a vision of "an educated, skilled and capable workforce for South Africa" and a mission of improving access to occupations in high demand and priority skills aligned to economic growth, employment creation, and social development, while also seeking to address systemic considerations.

The NSDP aims to achieve the following outcomes:

- Identifying and increasing the production of occupations in high demand;
- Improving the linkages between education and the workplace;
- Improving the level of skills in the South African workforce;
- Increasing access to occupationally directed programmes;
- Supporting the growth of the public institutional type as a key provider of the skills required for socio-economic development;
- Providing skills development support for entrepreneurship and co-operative development;
- Encouraging and supporting worker-initiated training; and
- Supporting career development services.

To this end, the two core principles of the NSDP are understanding skills demand and steering supply in a way that responds to demand. Indeed, the NSDP is clear on the fact that understanding skills demand is central to the achievement of its goals and, further, that analysis of sectoral growth and development plans and labour market information is central to understanding skills demand.

With respect to understanding skills needs, a multi-tiered approach is proposed in the NSDP:

- Firstly, determining skills at the organisational level and understanding skills needs in the workplace, in both the public and private sectors;
- Secondly, at the sectoral level, determining the skills of occupations in high demand and priority occupations; and
- Thirdly, determining skills at the national level, which includes provincial and local levels of occupations in high demand and priority occupations.

1.2. Aims and objectives

In line with the need for labour market intelligence to understand demand and steer supply, as articulated in the NSDP, this report aims to provide a holistic overview of skills supply and demand in South Africa, in order to inform the planning and provision of education and training. It takes a demand-led approach, which, while recognising the interaction between demand and supply, also recognises that ultimately the supply of skills in the country must be responsive to the skills needs of the country in order for workers to be employed and for employers to provide their goods and services, as articulated in the NSDP. Furthermore, it recognises that the economy's skills needs are dynamic and continually evolving.

The report seeks to provide a broad overview of skills demand, skills supply, and the imbalances between the two, providing signals of how skills supply should respond to changing skills demand in order to reduce imbalances. The report is expected to contribute to the responsiveness of the PSET system in meeting the skills needs of the country. It should be used as a resource to guide supply-side planning in PSET institutions, funding, and the development of qualifications that are appropriate for the needs of the labour market and the country.

The report provides analysis of the supply of, and demand for, skills in the country in order to propose a set of recommendations for skills development in post-school institutions and the workplace. Credible skills planning information is important for the following key reasons:

- It provides an understanding of skills supply and demand, in order to guide enrolment planning, programme development, and infrastructure investment requirements;
- It provides an understanding of the skill sets and profiles of the unemployed, so that suitable educational and training programmes can be developed;
- It supports the government's economic growth and development strategy and targets resources to the areas most in need, in order to tackle skills shortages;
- It provides credible information about where government should direct its resources, such that people gain skills that allow them to gain employment, thereby reducing unemployment; and
- It improves South Africa's overall skills level and competitiveness and contributes to poverty alleviation.

1.3. Structure of the report

The report starts with a chapter that highlights methodological issues, before proceeding to provide an overview of the South African economy in Chapter 3. Chapter 4 presents a profile of the South African labour force, which serves as an anchor point for the skills demand and supply sections that follow immediately thereafter. Chapter 5 provides a high-level overview of the demand for skills in the South African economy, drawing primarily on a sectoral and occupational breakdown of those employed in the South African economy. Chapter 6 presents a high-level overview of skills supply in South Africa, focusing on the educational profile of those in the South African labour force and describing the pipeline of skills represented by the qualifications currently being obtained in South African educational institutions. Chapter 7 provides a brief overview of the signals of skills imbalances in South Africa. Chapter 8 concludes with a summary of the key findings and recommendations of the report.

PART 2

Methodological issues

2.1. Framework for analysing skills supply, demand, and imbalances

This report provides an overview of the demand for skills and the supply of skills in South Africa and is the third issue of the *Skills Supply and Demand in South Africa* report. The first report was published in 2016 as part of the first phase of the Labour Market Intelligence Partnership (LMIP), a multi-year research effort funded by the Department of Higher Education and Training (DHET), while the second issue of the report was published in early 2019 by the DHET. The current report is the first to be produced under the second phase of the LMIP (LMIP2), funded by the DHET. The report is intended to present a high-level descriptive analysis of skills supply and demand, incorporating the findings emerging from the various LMIP2 research projects.

The *Skills Supply and Demand in South Africa* report aims to identify skills imbalances by incorporating various research approaches, detailed quantitative analysis, and the results of appropriate stakeholder engagement. Ultimately, the report intends to contribute to improving the responsiveness of the post-school education and training (PSET) system to the needs of the country's economy by supporting decision making around skills planning, in line with the goals of the National Skills Development Plan (NSDP) and the National Plan for Post-School Education and Training (NPPSET).

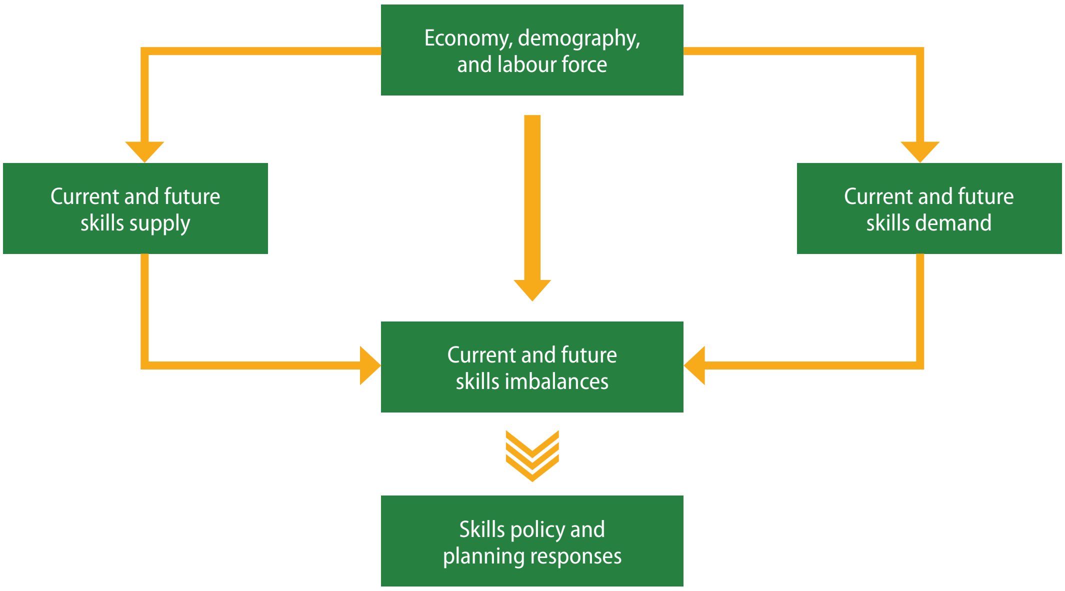
Aligning South Africa's education and training landscape (skills supply) more closely to the requirements of employers and the structure of the economy (skills demand) is what a skills planning system should aim to do. In particular, there needs to be a clear focus on the demand side of the economy: understanding the sectoral structure in South Africa and how it is shifting over time is critical, but this understanding has often been overlooked in the past.

Accordingly, and very broadly, labour market intelligence for the purpose of skills planning must speak to, first, the demand for skills; second, the supply of skills; and, third, imbalances between the demand for skills and the supply of skills. Indications of any skills imbalances that exist must then be used to inform the action to be taken within the PSET system to ensure that the supply of skills in the country is adequate for addressing the country's demand for skills.

The analysis of skills supply and demand in this report follows the approach of the original report and is guided by its analytical framework (Reddy et al., 2016). This framework is presented in Figure 2.1. The approach identifies signals of current and future demand for occupations of different skill levels. The understanding of skills demand involves four interrelated areas: the state of the economy, the characteristics of the employed and unemployed who make up the labour force, current demand, and future demand. Correspondingly, it is necessary to interpret the signals of skills supply from school and post-school institutions. The interaction between supply and demand provides signals of skills shortages and mismatches.

The methodological issues considered in producing this third report include the definition and measurement of skill, the time periods of the analysis, and data availability, as adapted from previous reports. A pragmatic decision was taken in the writing of this report to focus on high-level arguments, to provide clear signals for skills planning based on analysis of the available data, and to not become paralysed by the range of definitional terms. The approach followed is outlined below.

FIGURE 2.1: Framework for the analysis of skills supply, demand, and imbalances



Source: Reddy et al. (2016)

2.1.1. Defining 'skills'

The 2010 National Strategic Skills Audit for England indicates that "skills can be difficult to define and measure at an aggregate level since they are socially constructed, intangible and unobservable. Research uses a number of different measures to assess the quantity, level and content of skills possessed and deployed in the workplace" (UKCES, 2010, p. 9).

In practical terms, skills can often be measured based on educational qualifications and occupations, both of which are used as proxies for skill in this report, depending on the available data. From the perspective of qualifications, low skills are those qualified at pre-matriculation National Qualifications Framework (NQF) levels (Levels 1–3) or no schooling (less than Level 1); intermediate skill levels are those qualified at NQF Levels 4–5; and high skills are those qualified at NQF Levels 6–10. In terms of occupations, 'low-skill' refers to elementary occupations; 'medium-skill' refers to clerical support workers, service and sales workers, skilled agricultural, forestry, and fishery workers, craft and related trades workers, and plant and machine operators and assemblers; and 'high-skill' refers to managers, professionals, and technicians and associate professionals.

2.1.2. Understanding skills demand

On the demand side, understanding the economy's skills requirements is critical. Without a clear sense of the required mix of skills, it is difficult to formulate appropriate policy that will improve the alignment between skills demand and supply. Skills requirements may be understood in terms of either current skills demand or future skills demand and may give rise to policy interventions with different time horizons.

Current employment is generally the starting point for analysing current skills requirements. However, where particular skills are in short supply, current employment may not reflect the demand for skills. Consequently, an assessment of current skills requirements should incorporate information arising from current employment patterns, as well as from various other sources, including vacancies and feedback from employers regarding skills shortages.

Future skills requirements are derived on the basis of projections of future skills demand. Assuming that skills demand is met by supply, future skills demand is reflected in future employment. More specifically, future skills demand is reflected in the occupational distribution of future employment. The analytical approach typically used is thus to predict future employment by occupation. The occupations that are predicted to be required in the economy in the future are then mapped to the appropriate qualifications that provide the skills required for these occupations through an occupations–qualifications mapping process. This process then provides the skills (qualifications) requirements of the economy, or the predicted skills demand.

Projecting future employment is done on the basis of historical trends in employment, combined with the expected effects on future employment of a variety of trends and factors, including technological change and government interventions in the economy. At its most basic, projections of future employment may be a simple extrapolation of historical trends applied to current employment. However, more realistic and nuanced projections may be obtained from an economic projection model. In effect, these projections are characterisations of the expected economic growth path, which sees predicted skills demand as evolving from current skills demand.

2.1.3. Understanding skills supply

On the supply side, the stock of skills in the economy is of central interest. An analysis of the current stock of skills (or the current skills supply) is based primarily on an understanding of both the current supply of labour in the country (i.e., the labour force) and the mix of skills (or qualifications) available. It should be noted that analysing skills supply in terms of occupations is not always possible, particularly in countries like South Africa, where a large proportion of the unemployed have never worked before and hence have no specific occupation.

A consideration of the future skills supply requires additional information over and above that related to the current stock of skills. Detail regarding the education and skills pipelines becomes important, as does information on demographic trends, migration, and trends in labour force participation.

2.1.4. Understanding skills imbalances

Within the labour market, skills supply is matched against the skills requirements (or skills demand) of the economy. In scenarios where skills supply and skills demand were aligned with each other, no specific adjustment or intervention would be required in the education and training system. However, if skills supply and skills demand were not aligned, the result would be a skills imbalance that would need to be addressed through appropriate policy and implementation actions. The Organisation for Economic Co-operation and Development (OECD) (2017) distinguishes between three types of skills imbalances:

1. *Skills shortages* arise when skills demand exceeds skills supply. Employers are unable to find staff with the required skills in the labour market at the going rate of pay and under existing working conditions due to the lack of an adequately skilled workforce.
2. *Skills surpluses* occur when skills supply exceeds skills demand. Skills surpluses are characterised by a relatively high supply of but a low demand for a given skill and can be identified by high unemployment.

3. *Skills mismatches* can refer to the inadequacy of workers' skills relative to the requirements of the jobs they are currently in or to a situation in which workers' skills exceed those required for their current jobs. Skills mismatches can be measured relative to qualification level, field of study, or competencies. From the perspective of employers, the competencies that are perceived to be lacking in workers are often referred to as 'skills gaps'.

The types of imbalances identified through these considerations of supply relative to demand inform the actions that need to be taken on the supply side (that is, in the education and training system) so that the demand for skills (or the skills requirements) in the economy can ultimately be met by the supply of skills.

Appropriate feedback (the identification of skills imbalances), and decisive action taken in line with that feedback (interventions that address skills imbalances), can result in an adjusted education and training system, which should be able to transform the current stock of skills into a future stock of skills that is better aligned with the skills requirements of the economy. Such a transformation would then narrow the gap between the predicted skills demand and the predicted skills supply.

2.2. Limitations of the approach

This is the third report analysing skills supply and demand at the national level, and there are several conceptual and methodological limitations worth noting. From a conceptual perspective, it is important to understand that matching supply and demand is not a perfect science. There are many unpredictable factors that can influence this process, making it difficult to anticipate exact future imbalances. At best, it is possible to gather evidence on different signals and to identify occupational areas where skills imbalances or mismatches may occur. Using this evidence, it is possible to provide guidance to planners and managers on what interventions are available immediately, or over the short to medium term, to tackle skills mismatches. However, it is not possible with any degree of accuracy to recommend what can be done over the longer term, as deliberate estimates of the exact numbers of skills required in the long run are rarely correct or useful to policy makers.

The approach adopted in this report is further limited by the scarcity and quality of data related to skills demand and skills supply in South Africa. For this reason, most of the evidence presented here relies on data from household surveys, most notably the Quarterly Labour Force Surveys (QLFS), undertaken by Statistics SA (Stats SA). The analysis is often restricted to the period 2009–2019, because, when going back further than the starting point of this period, certain methodological issues arise. In South Africa, there have been several changes in the definitions of broad occupational categories over the decades, and the use of surveys has also changed. These inconsistencies make it difficult to track trends over time and to see how skills demand has changed.

A further limitation is that the sample size is not large, making it difficult to get accurate occupational data beyond the two-digit level, which prevents the analysis of demand for specific occupations beyond two digits. Larger sample sizes, especially for the QLFS, would help in improving the quality of the data used in this report by permitting deeper levels of data disaggregation.

A major information gap exists in terms of the data provided by firms themselves regarding their demand for skills. Consequently, current and historical employment data – such as that derived from household surveys – are used to note trends in the demand for labour and skills from employers. However, the total skills demand includes not only the skills of those who are employed but also skills the employed do not have that may be desired by their employers, as well as the demand for skills that is currently not being met by individuals. Comprehensive, good-quality data do not currently exist on these last two categories (desirable skills and unmet skills), although there have been various efforts to collect firm-level data on the part of SETAs and the DHET itself.

A further gap involves understanding how qualifications have affected the employment (as well as other outcomes) of the individuals who have obtained them. Tracer studies analyse the same subject observed at two or more points in time and could be used to provide better insights with respect to the outcomes of higher education (HE) and technical and vocational education and training (TVET) graduates. This type of data remains scarce, however, despite its potential to produce valuable insights into skills imbalances in South Africa. The DHET is currently undertaking a tracer study for TVET college graduates and plans to undertake a similar study for university graduates. The findings of such studies will undoubtedly enrichen future reports of this nature.

Despite the limitations mentioned in this section, every effort has been made in this report to make the best use of the available data. Where possible, analysis draws on several different data sources to triangulate findings, add to the validity of the findings, and provide a strong basis for the recommendations made in the report.

PART 3

The South African economy

PART 3

For much of the post-apartheid era, South Africa has experienced real GDP growth. However, the long expansionary phase that began after the 1997–1998 Asian financial crisis came to an abrupt end as a result of the 2008–2009 global financial crisis. In the aftermath of the local recession in 2018, the economy has returned to growth, but growth rates have been subdued and the recovery remains fragile (Bhorat et al., 2014). The post-apartheid growth experience reflects an economy that remains vulnerable to external shocks and largely determined by trends in global growth and demand.

Due to weak economic growth, the economy has been unable to create new jobs and absorb the growing labour force, resulting in upward pressure on already high unemployment rates. The labour market distortion has ultimately manifested itself in stark inequalities. South Africa's overall household income Gini coefficient, driven by labour income inequality, was 0.673 in 2015, virtually unchanged from 0.681 in 1993 (Hundenborn et al., 2016; Stats SA, 2019a). This constitutes one of the highest rates of inequality in the world, despite the slight decline since 1993.

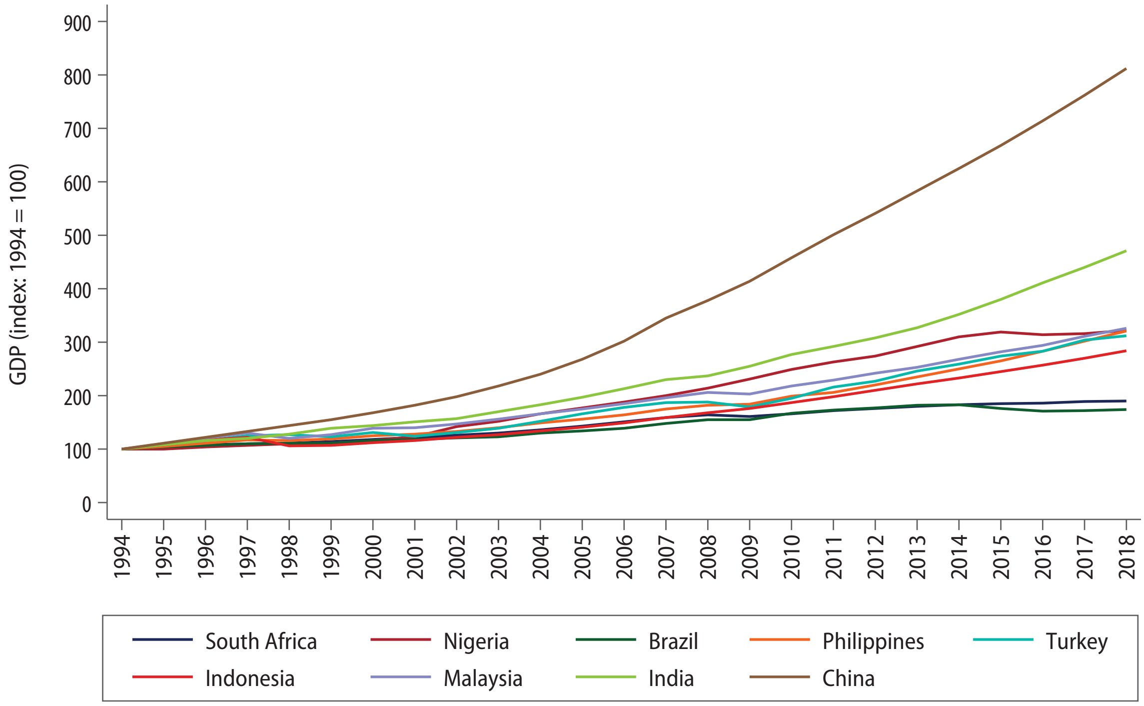
A demand-led approach to skills planning must be underpinned by a strong understanding of the factors that drive demand in the overall economy. This demand, however, must also be understood within the context of the unique challenges faced by South Africa in terms of poverty, unemployment, and inequality. This chapter therefore provides context for skills planning by describing the state and the evolution of the South African economy in comparison with other countries, before considering what the implications of the current state of the economy are for skills planning in the country.

The chapter begins by discussing economic growth in South Africa and the structure of the South African economy. It then considers South Africa's saving and investment patterns and trade capacity, as well as South Africa's growth performance in comparison to other middle-income countries. Finally, it considers what constrained economic growth has meant for unemployment and inequality in the country.

3.1. Economic growth

While a large number of countries have reached middle-income status since the 1950s, very few have achieved high-income status. Despite periods of rapid economic growth, middle-income countries have tended to experience a sharp deceleration in economic growth, accompanied by declining aggregate productivity growth – the so-called 'middle-income growth trap' (Agénor, Canuto, & Jelenic, 2012; Agénor & Canuto, 2015). Examples of such economies include South Africa, Brazil, Nigeria, Turkey, and the Philippines. Figure 3.1 shows the changes in GDP since 1994 in these emerging economies; South Africa and Brazil have lagged behind their counterparts.

FIGURE 3.1: GDP of South Africa and selected countries, 1994–2018



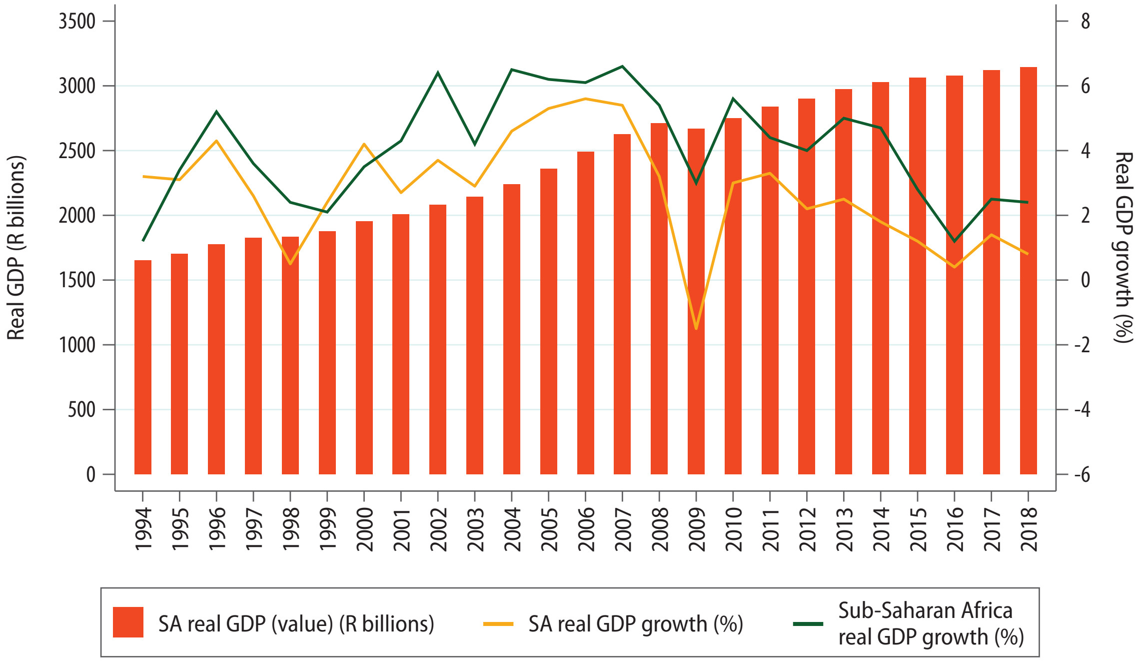
Source: World Bank (2019)

Notes:
1. The GDP index is calculated using 1994 as the base year (1994 = 100) for each country.

Slow growth in middle-income economies is often related to a number of common features. These include, for example, an over-dependence on export revenues derived from resource-based products; a capital-intensive path of industrialisation; a consumption- rather than investment-driven growth trajectory; and a reliance on state infrastructure for domestic growth. Some of these features can be observed within the South African context.

The low and volatile growth rates experienced since 1994 reflect an economy that is vulnerable to external shocks, and one that remains largely driven by trends in global growth and demand. As is evident in Figure 3.2, the sharp declines in growth in 1998 and 2009 reflect the aftermath of the 1997–1998 Asian financial crisis and the 2008–2009 global financial crisis, respectively. In both instances, the contagion effect of these crises appears to have had a more significant impact on growth in South Africa compared with other sub-Saharan African countries. This disparity may be driven by the fact that the South African financial services industry is relatively developed and globally connected and thus susceptible to adverse shocks in international financial markets. Slow economic growth has had an impact on employment, exacerbating already high unemployment levels and income inequality over the past 10 years (Bhorat et al., 2014).

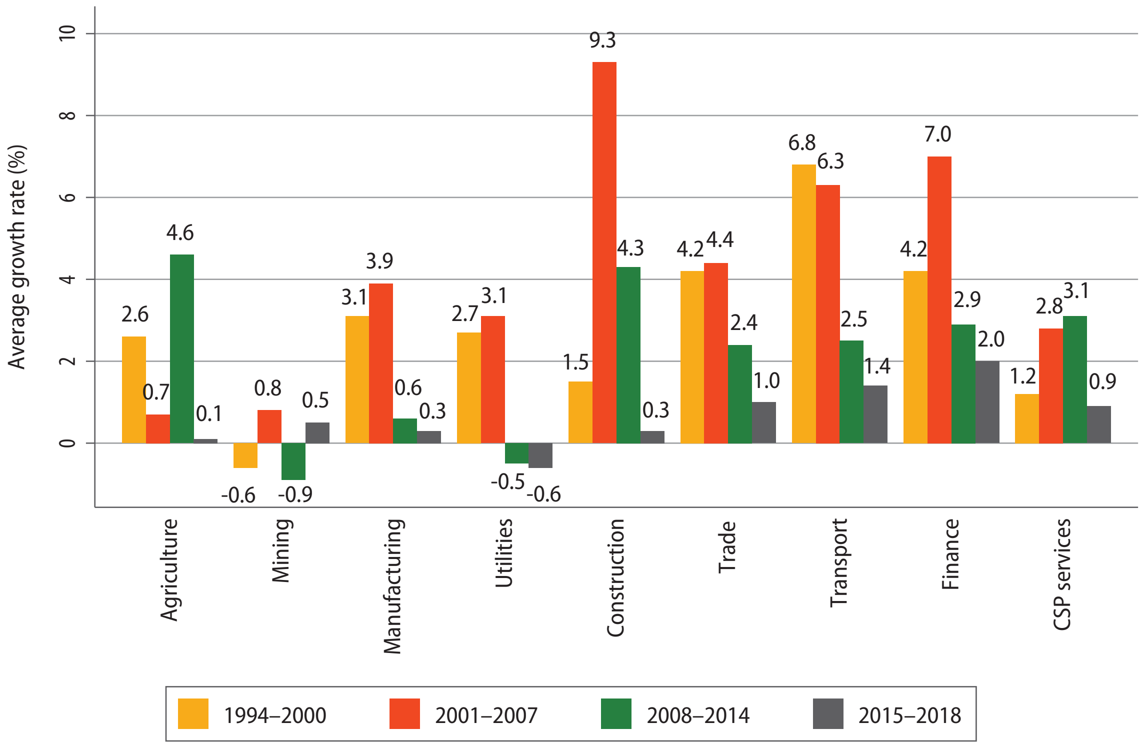
FIGURE 3.2: Trends in the absolute value of GDP and real GDP growth, 1994–2018



Source: South African Reserve Bank (SARB, 2019); World Bank (2019)

Despite this susceptibility to global shocks, the South African economy sustained positive and increasing levels of growth between 2001 and 2007. This was partly the result of growing domestic demand, underpinned by rising household consumption expenditure, as well as an expansion in the manufacturing, construction, and financial services industries. Manufacturing output grew at an average annual rate of 3.1 percent between 1994 and 2000 and 3.9 percent between 2001 and 2007, as trade liberalisation policies, combined with a favourable exchange rate, began to boost South Africa's manufacturing exports (Figure 3.3). Construction output grew significantly, at an average annual rate of 9.3 percent between 2001 and 2007, largely on account of infrastructure spending and preparations for the 2010 FIFA World Cup. The average output growth of 7.0 percent in the financial services industry reflected growing retail banking and insurance services. Similarly, positive output growth in mining between 2001 and 2007, following negative growth in the previous period (1994–2000), further indicates the growth effects associated with the global commodities super-cycle and with China's strong demand for natural resources.

FIGURE 3.3: Average sectoral GDP growth rates, 1994–2018



Source: SARB (2019); World Bank (2019)

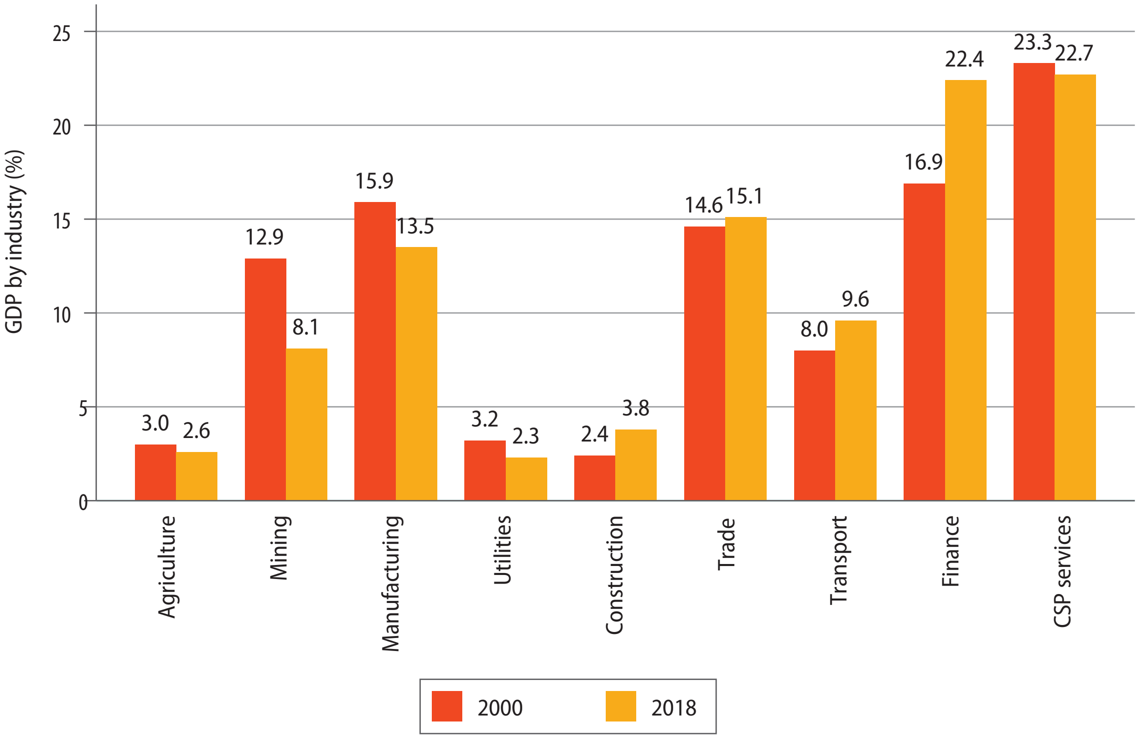
The boom in sectoral output in the 2000s was, however, brought to a halt in 2008 and 2009, following the global economic recession, as Figure 3.3 makes clear. In particular, manufacturing output growth declined to an average annual rate of 0.6 percent between 2008 and 2014, while mining output contracted by 0.9 percent per annum over the same period. The rapid expansion in agricultural output of 4.6 percent per annum during the 2008–2014 period was mainly driven by expansion in the production of animal products (such as poultry products, red meat, and milk) and horticultural products (such as various fruit and vegetables) (DAFF, 2016).

Economic growth in post-apartheid South Africa, while modest, has been driven largely by capital-intensive industries, retail trade, and financial services, rather than by productive and labour-intensive elements within the agriculture and manufacturing industries. In fast-growing, middle-income countries, there has been a tendency to follow a development pathway characterised by a shift in economic activity and employment from low-productivity industries, such as agriculture, to high-productivity industries, such as manufacturing, and then ultimately to high-skilled services industries (Bhorat et al., 2014). This growth path leverages new technologies, builds a skilled labour force, and raises productivity, which together lead to higher levels of growth and employment.

In South Africa, however, this has not been the case. The contribution to GDP of the manufacturing industry has declined over time, while that of financial services, transport, and community, social, and personal (CSP) services has increased (Figure 3.4). Mining's contribution to GDP declined by 4.8 percentage points between 2000 and 2018, from 12.9 percent to 8.1 percent, while manufacturing's share declined by 2.4 percentage points over the same period, from 15.9 percent to 13.5 percent; agriculture's share drifted even lower, to 2.6 percent in 2018. In stark contrast, the share of GDP accounted for by financial and business services grew by 5.5 percentage points, from 16.9 percent in 2000 to 22.4 percent in 2018.

The sectoral contributions to GDP depicted in Figure 3.4 suggest that the relative collapse of the mining industry, combined with weak performances in the agriculture and manufacturing industries, has essentially generated a growth path starved of regular, low-wage jobs. Amid this growth lacuna, output generation has been forced into a high-skills-biased employment trajectory, dependent on the financial services industry for growth and on the retail industry and public sector for jobs.

FIGURE 3.4: Contribution to GDP by industry, 2000–2018

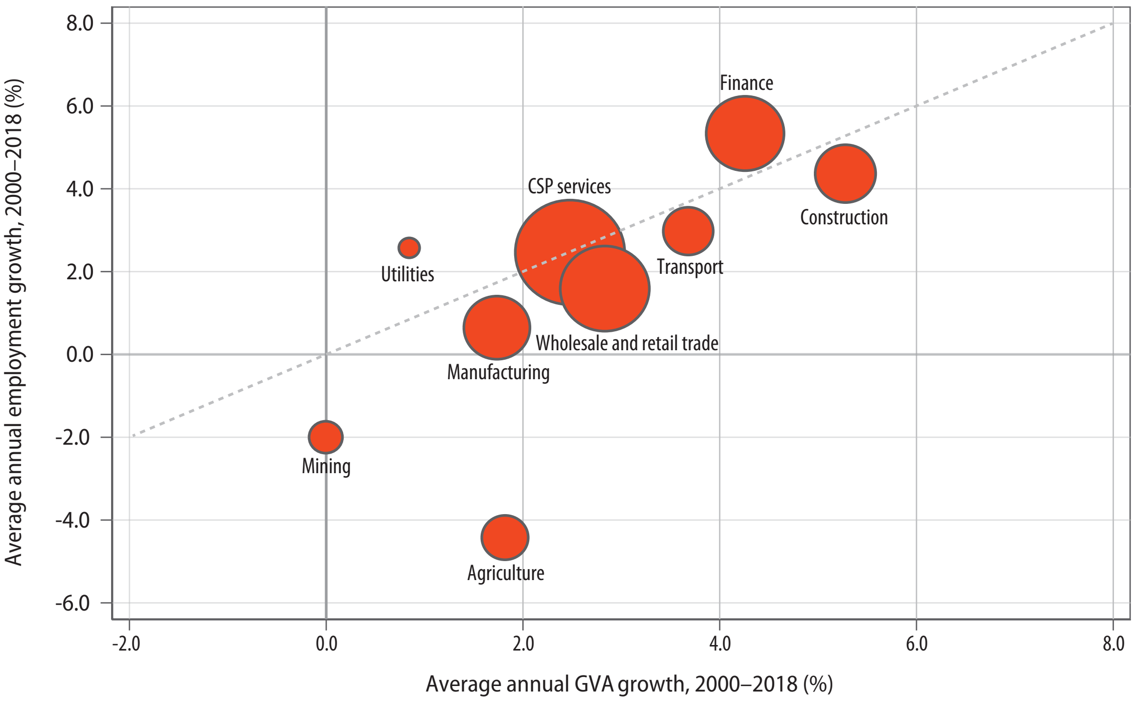


Source: SARB (2000, 2018)

The economic growth and employment trajectory can be seen in Figure 3.5, which shows the interaction between the sectoral contribution to GDP and employment growth. Each bubble represents an industry, and the size of the bubble indicates the relative size of employment in that industry in 2018. The co-ordinates of the centre of each bubble indicate the industry's output and employment growth over the 2000–2018 period. Bubbles above the 45-degree line show industries in which employment growth exceeded output growth for the period, and vice versa for bubbles below the line. Where there are no changes in the employment intensity of production, industries with positive output growth are expected to have positive employment growth, while declining industries are expected to shed jobs (Bhorat et al., 2014).

Figure 3.5 reveals that most of the industries lie below the 45-degree line, indicating a declining labour intensity of production. Mining and agriculture fared particularly poorly over the 2000–2018 period: mining output remained virtually unchanged, while agricultural output grew at 1.8 percent per annum. However, employment declined considerably in both industries, falling by 2.0 percent per annum in mining and 4.4 percent per annum in agriculture. Employment growth in manufacturing – the industry traditionally seen as an engine of employment growth in developing economies – was close to zero over the period, despite an average annual output growth of 1.7 percent.

FIGURE 3.5: Gross value added and employment growth by industry, 2000–2018



Source: SARB (2000, 2018); Stats SA (2000, 2018)

Notes:
1. The size of the bubbles indicates relative employment levels in each industry in Q2 2018.

In construction, relatively high output growth was coupled with relatively high employment growth over the period, although employment growth did not keep pace with output growth. In the case of utilities, finance, and, to a lesser extent, CSP services, employment growth exceeded output growth, pointing to the rising labour intensity of production in these industries. Over the period, output in utilities, finance, and CSP services grew by 0.8 percent, 4.3 percent, and 2.5 percent per annum, respectively, while the corresponding employment growth rates were 2.6 percent, 5.3 percent, and 2.5 percent per annum.

Growth in the secondary and tertiary sectors between 2000 and 2018 was not sufficient to absorb new entrants into the labour market, on top of those who had lost jobs in agriculture and mining (Table 3.1). Between 2000 and 2018, the primary sector shed 1.2 million jobs, while the secondary sector added just over 1 million jobs, mainly as a result of employment growth in the construction industry. Clearly, then, the tertiary (or services) sector broadly drove employment growth over the period. Within the tertiary sector, CSP services (which includes government), financial and business services, and wholesale and retail trade were responsible for the bulk of employment growth, adding 1.6 million, 1.4 million, and 750 000 jobs, respectively, between 2000 and 2018.

TABLE 3.1: Employment growth by sector, 2000–2018

	EMPLOYMENT GROWTH (2000–Q2 2018)		EMPLOYMENT SHARES (%)		SHARE OF CHANGE (2000–Q2 2018) (%)
	ABSOLUTE ('000s)	RELATIVE (%)	2000	2018	
PRIMARY	**-1 218**	**-48.79**	**20.49**	**7.85**	**-29.68**
Agriculture	-1 052	-55.49	15.55	5.18	-25.62
Mining	-167	-27.68	4.94	2.67	-4.06
SECONDARY	**1 034**	**44.08**	**19.26**	**20.75**	**25.20**
Manufacturing	172	10.92	12.91	10.71	4.18
Utilities	67	71.12	0.77	0.99	1.63
Construction	796	117.04	5.58	9.06	19.39
TERTIARY	**4 383**	**60.55**	**59.41**	**71.35**	**106.81**
Wholesale and retail trade	750	30.40	20.26	19.76	18.28
Transport	434	74.86	4.76	6.23	10.58
Finance	1 425	146.30	8.00	14.73	34.73
CSP services	1 614	77.65	17.06	22.67	39.33
Domestic services	159	14.01	9.33	7.96	3.88
TOTAL	**4 104**	**33.68**	**100.00**	**100.00**	**100.00**

Source: Own calculations, LFS (September 2000) and QLFS (Q2 2018)

Notes:

1. Sectors do not add up to 100 (or the total) due to non-standard classified sectors, such as exterritorial organisations, representatives of foreign government, and other activities, not being adequately defined. The non-standard sector decreased by 953 000 jobs over the period.

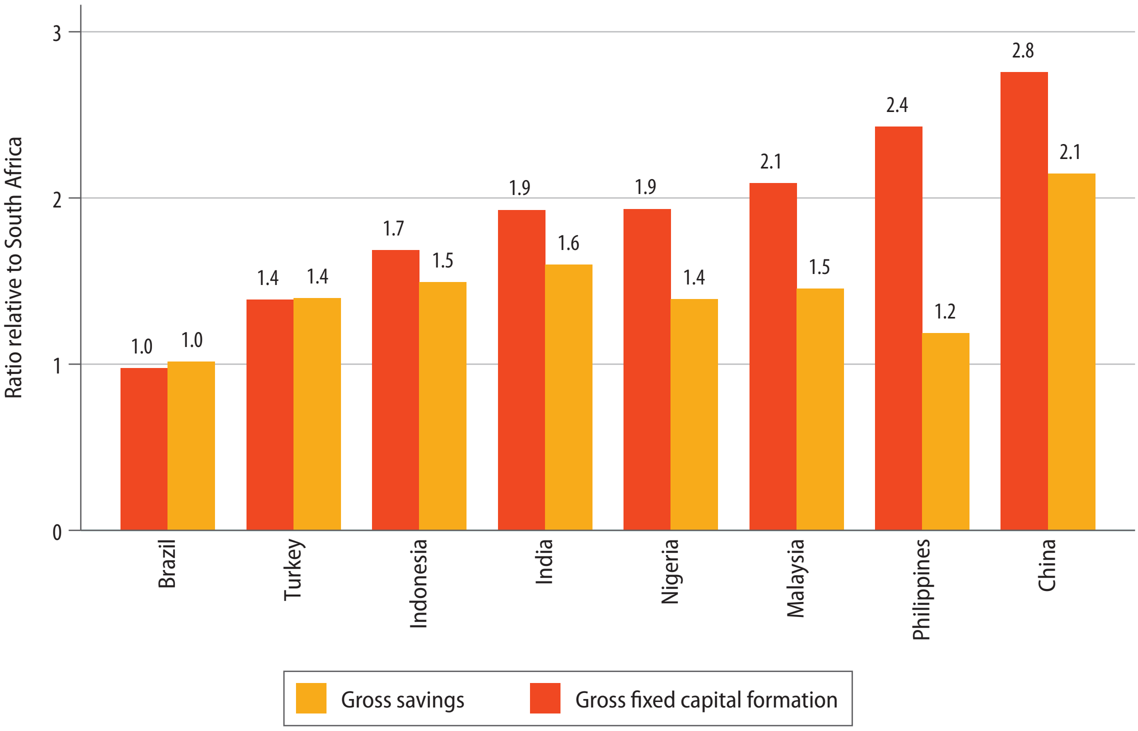
The post-apartheid period has, thus far, been characterised by the erosion of primary sector employment and a significant deterioration of manufacturing as an employer. The modest growth levels in South Africa since 1994 have been marked by a rise in financial and business services, as well as wholesale and retail trade. Indeed, just three industries – CSP services, finance, and construction – are responsible for more than three-quarters (76.2 percent) of total employment growth over the 2000–2018 period. Once wholesale and retail trade is included, this proportion rises to over 91 percent. By contrast, agricultural and mining workers experienced the worst employment outcomes over the period. Significant job losses were experienced by agriculture workers, with a 55.49 percent decline in employment between 2000 and 2018. Meanwhile, mining saw a decline in employment of 27.68 percent compared to 18 years earlier. In short, the post-apartheid growth path has been built around South Africa's sophisticated and globally competitive finance industry and its consumer-driven domestic aggregate demand.

Sustained low levels of economic growth over the past decade have had a negative impact on employment, perpetuating high levels of unemployment and household income inequality. Longer-term growth at appreciably higher levels would underpin employment and improved living standards, but such growth would have to involve a far broader spectrum of the economy than the tertiary sector. The weaknesses of the mining, agriculture, and manufacturing industries hinder the long-term ability of the South African economy to grow, generate employment, and improve living standards.

3.2. Fixed investment and savings

High investment and savings rates have traditionally been considered key drivers of economic growth, at least in fast-growing emerging markets in Asia. By contrast, South Africa's investment and savings rates have been relatively low. Between 1994 and 2018, gross savings and gross fixed capital investment averaged 16.2 percent and 18.3 percent of GDP, respectively. Figure 3.6 presents the average investment and savings rates of selected middle-income countries relative to those of South Africa. Countries with similarly low growth rates, such as Brazil and Turkey, have shown correspondingly low investment and savings rates. Conversely, investment and savings rates in fast-growing Asian economies have been substantially greater than those of South Africa over the period. For example, savings rates in Malaysia, the Philippines, and China are more than double the savings rate achieved in South Africa.

FIGURE 3.6: Ratio of average savings and investment for selected countries relative to South Africa, 1994–2018



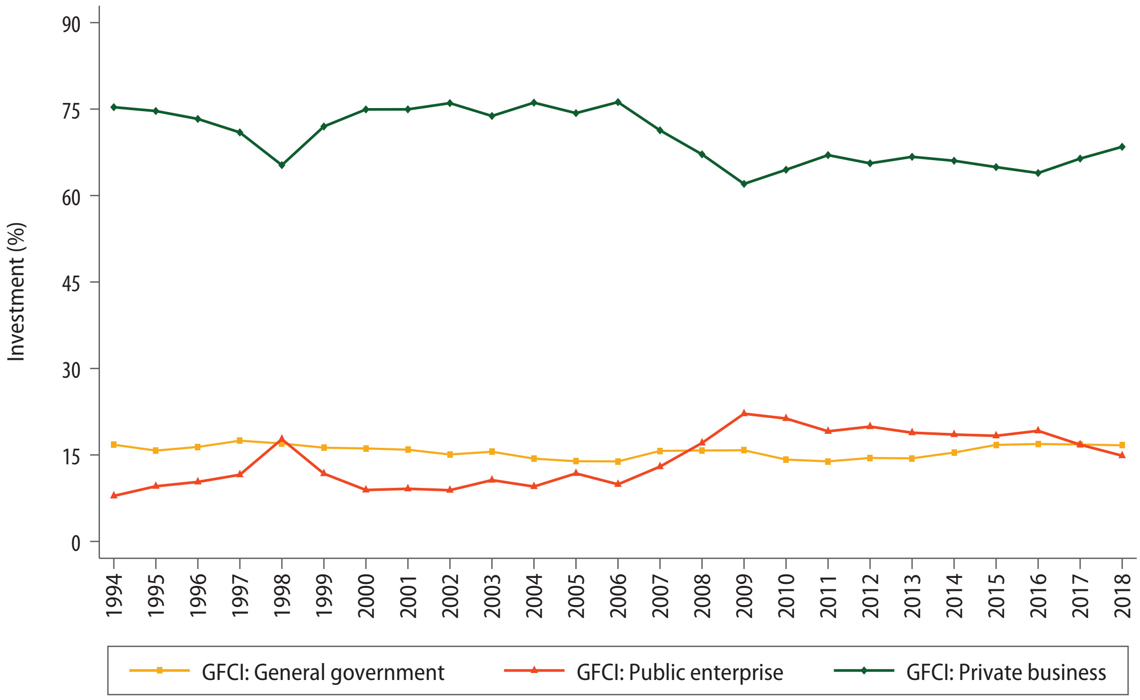
Source: World Bank (2019)

Notes:
1. The ratios of investment and savings for Malaysia, India, and China relative to South Africa are for the period 1994–2017.

Low savings rates in South Africa are the result of various factors. Persistent low economic growth and low per capita income growth, high unemployment, and low public savings are among the factors impeding domestic savings, creating a cycle of insufficient savings and economic stagnation (Loayza et al., 2000). The low savings rate also partly explains South Africa's low fixed investment rate. In particular, real returns averaged around 15 percent for the period 1994–2008, while nominal returns were 22 percent in the 2005–2008 period, the same as in China, albeit over a longer period. Returns were substantially higher than the prime lending rate, which is surprising given the modest growth experienced by the South African economy. However, as returns increased, investment levels tapered off. It is possible that domestic and foreign investors in South Africa may be inelastic with respect to return on capital but somewhat more elastic with respect to other factors, such as perceived political risks, structural impediments, and low national savings rates. Structural impediments include low levels of industrial competition, because of concentrated industries with high barriers to entry; volatile labour relations that are essentially a tax on investment; and the scarcity of skills (Bhorat et al., 2014). These impediments have the effect of raising the cost of doing business, which may outweigh the high investment returns available in the South African market.

Where investment has grown, it has been driven by the private sector, with government and public enterprise expenditure tending to be fairly low (Figure 3.7). Private investment accounted for between 65 percent and 75 percent of total investment between 1994 and 2018. This contribution was facilitated by large-scale capital expenditure projects in the mining, platinum, automotive, chemical manufacturing, retail, real estate, and tourism industries. It is worth noting that industries that attracted investment during this period were invariably capital-intensive in nature, thus reinforcing the economy's capital-intensive growth trajectory.

FIGURE 3.7: Gross fixed capital investment trends in South Africa, 1994–2018



Source: SARB (2019)

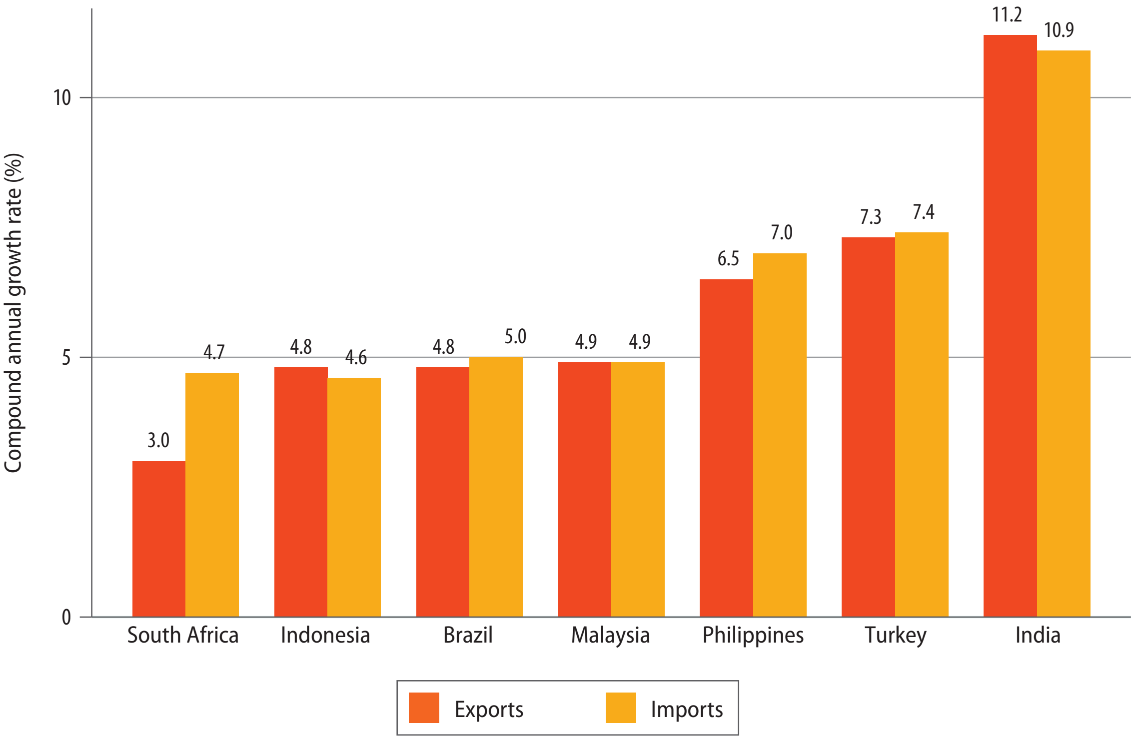
PART 3

3.3. Export growth and diversification

In addition to high savings and investment rates, fast-growing middle-income countries have generated and sustained high growth and employment rates by building export capacity, boosting international competitiveness, and, more importantly, diversifying their basket of exports. For example, in India, Turkey, and the Philippines, exports for the period 1994–2018 increased at an average annual rate of 11.2 percent, 7.3 percent, and 6.5 percent, respectively. In South Africa, during the same period, exports grew by just 3.0 percent annually.

Despite relatively low growth in exports, South Africa's trade capacity appears to be in line with several other middle-income countries (Figure 3.8). Nevertheless, in fast-growing Asian economies, such as India and Malaysia, export growth has been higher than the growth in imports over the 1994–2018 period. In South Africa, Brazil, and Turkey, where economic growth has been relatively low, exports have grown at a similar or lower rate than imports have. This suggests that a trade orientation tilted towards exports is associated with high levels of economic growth (Ee, 2016).

FIGURE 3.8: Annual growth of exports and imports of goods and services for selected countries, 1994–2018

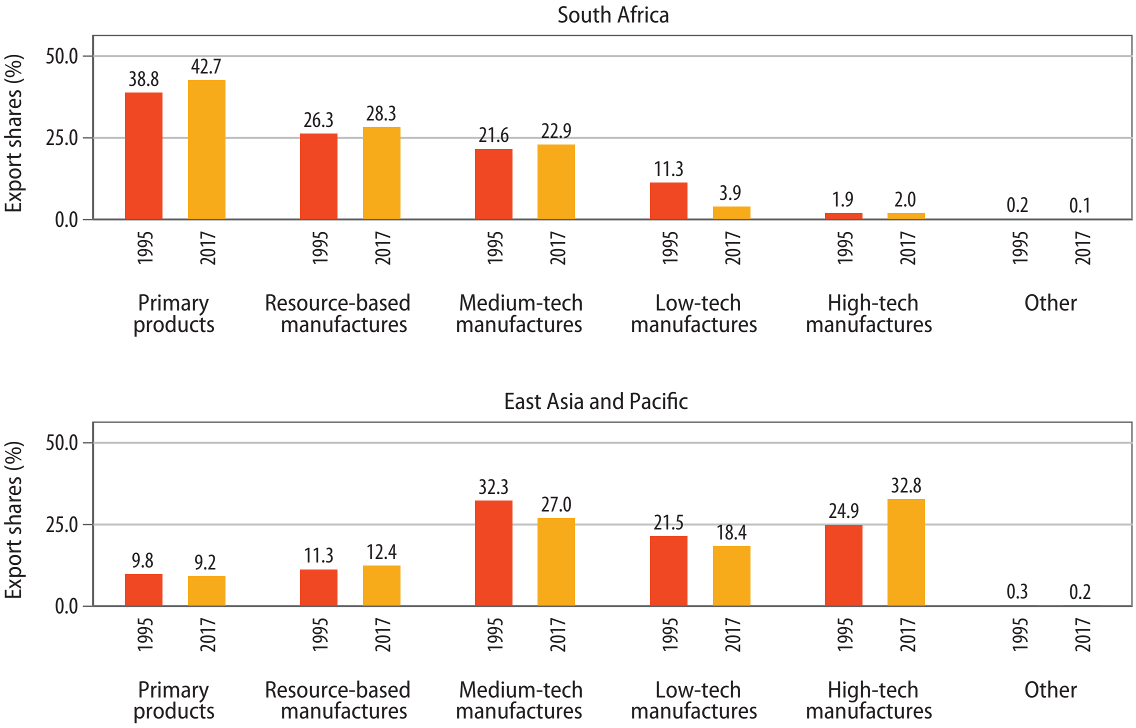


Source: World Bank (2019)

Notes:
1. China is excluded from the sample of countries due to the unavailability of exports- and imports-level data.

A key factor preventing slow-growing middle-income countries from catching up to fast-growing Asian economies has been limited diversification of exports towards manufacturing and high-technology exports (Bhorat et al., 2014). In Figure 3.9, export shares for South Africa and the East Asian and Pacific regional aggregate are provided for the years 1995 and 2017, using the Lall (2000) classification. The Lall (2000) classification categorises export products by technology level. Countries that are able to diversify their export structures away from primary products and resource-based manufactures are better placed to experience sustained economic growth and thereby shift to higher levels of economic development.

FIGURE 3.9: Export shares for South Africa and the East Asia and the Pacific region using the Lall classification, 1995 and 2017



Source: Own calculations, Base pour l'Analyse du Commerce International (BACI, 2019)

South Africa's export structure remains rooted in primary products and resource-based manufactures: these products accounted for approximately two-thirds of total exports in both 1995 and 2017. With respect to 'pure' manufactures (the sum of low-, medium-, and high-technology manufactures), the overall share of total exports has remained fixed, while there has been a shift within this broad category away from low-technology manufactures and towards medium-technology manufactures. This shift can be largely explained by the decline of the clothing and textiles industry (low-technology manufactures) and the subsidisation and growth of automotive exports (medium-technology manufactures). The share of high-technology manufactures for South Africa is comparatively low, at approximately 2 percent. The only evidence of significant diversification in exports is through insurance and financial services (4 percent average annual growth).

The Asian regional aggregate exhibits a more dynamic manufacturing base, with low-, medium-, and high-technology exports constituting more than three-quarters of total exports in both 1995 and 2017. This export picture stands in stark contrast to that of South Africa, where primary and resource-based manufactures account for the bulk of exports (65.1 percent in 1995, and 71 percent in 2017). The share of high-technology manufactures is the lowest in South Africa, changing only slightly from 1.9 percent in 1995 to 2.0 percent in 2017. The technology-intensive export structure of the Asian regional aggregate is consistent with the comparatively high economic growth rates evident in this region.

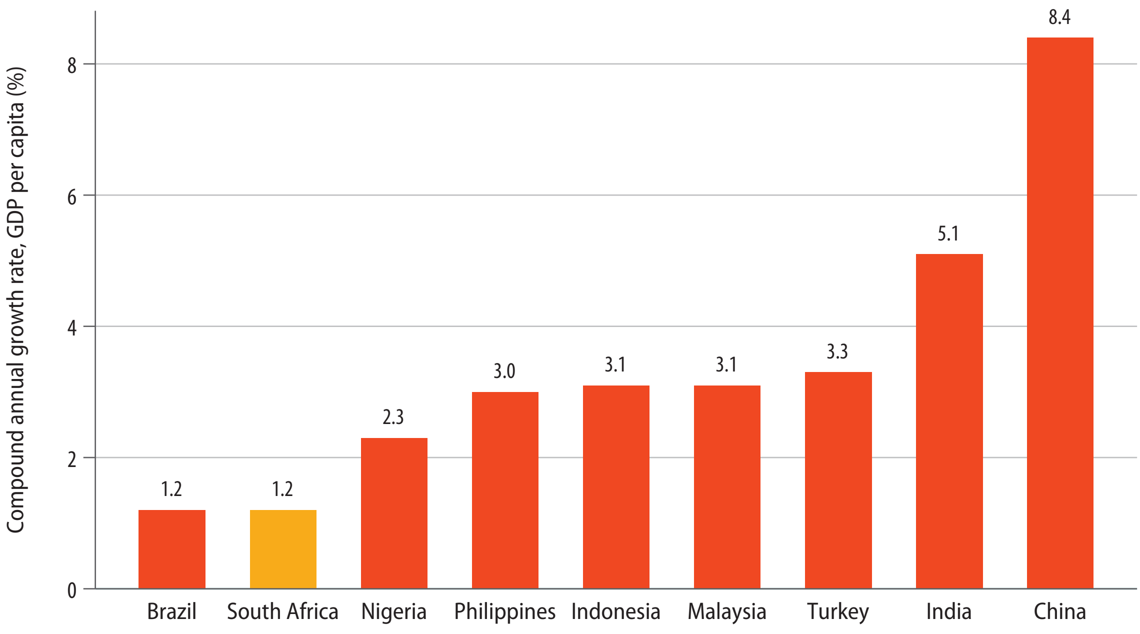
In summary, in the post-1994 period, South Africa reentered the global economy through a rapid process of trade liberalisation. While imports and exports increased relatively sharply, South Africa lagged behind its emerging-market peers, who had better production methods and a more diversified basket of export goods. While sanctions had encouraged the domestic diversification of production in South Africa, management, skill, and technology levels were not comparable to those in other developing countries.

In addition, liberalisation led to greater import penetration than export diversification – although it is true that, in the earlier years of liberalisation, South African producers appeared able to respond to export opportunities. South African competitiveness was, however, hampered by several factors, including skills constraints and a notoriously volatile exchange rate. In addition, investment has been biased towards heavy manufacturing as opposed to light manufacturing industries. As a result, exports comprise a large share of commodity exports (ores and metal exports). Furthermore, manufactured exports still rely heavily on primary commodity inputs. As such, South Africa's export profile continues to be capital-intensive in nature and driven by natural resources (Edwards, 2001; Bhorat et al., 2014).

3.4. Middle-income country comparison

The middle-income country growth trap is often illustrated by a cross-country comparison of average GDP per capita growth rates. Figure 3.10 shows average annual GDP per capita growth over the period 1994–2018. It is evident that South Africa has lagged behind its middle-income peers, along with Brazil. South Africa's average annual growth rate of 1.2 percent sits well below that of other middle-income countries, such as the Philippines, Indonesia, Malaysia, India, Turkey, and China, all of which achieved growth rates in excess of 3 percent for the period.

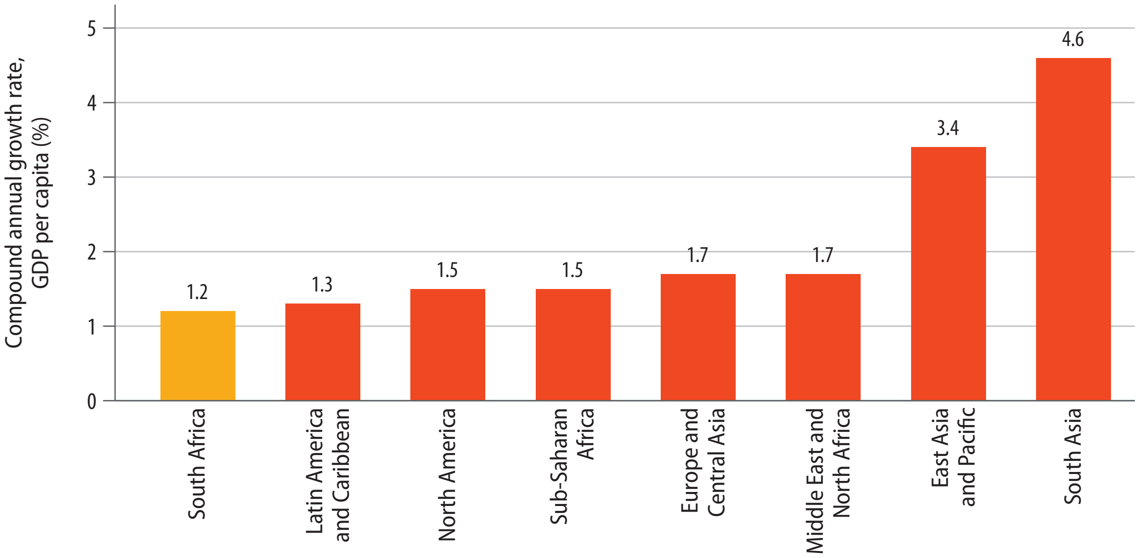
FIGURE 3.10: Average annual growth of GDP per capita, 1994–2018



Source: World Bank (2019)

A pattern similar to, though less pronounced than, that depicted in Figure 3.10 emerges when South Africa's per capita GDP growth rate is compared with regional averages (Figure 3.11). Unmistakeably, Asian economies experienced the highest levels of per capita income growth for the period 1994–2018. This comparative perspective adds weight to the argument that South Africa is caught in a low-growth trap.

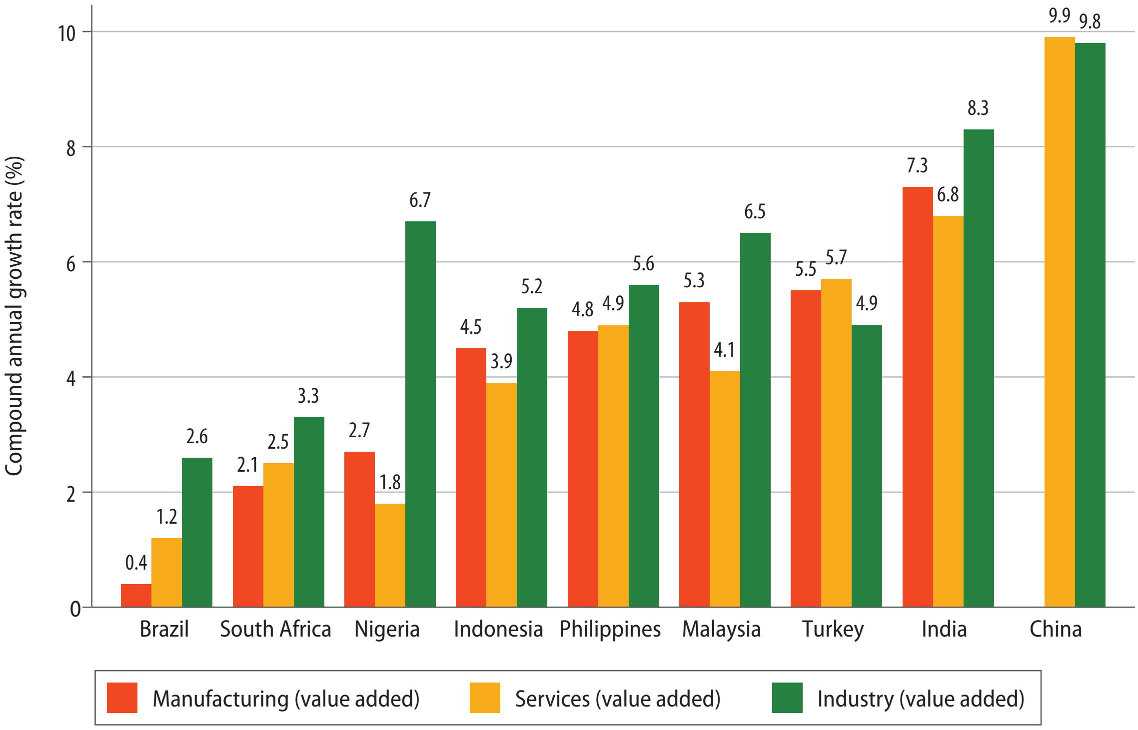
FIGURE 3.11: Regional annual growth of GDP per capita, 1994–2018



Source: World Bank (2019)

A cross-country comparison of sectoral growth rates between 1994 and 2018 also indicates that South Africa's productive sectors have lagged severely behind those of fast-growing Asian economies. As illustrated in Figure 3.12, manufacturing value added during this period grew at an average annual rate of 7.3 percent, 5.3 percent, and 4.5 percent in India, Malaysia, and Indonesia, respectively. Brazil had the lowest average annual growth rate in manufacturing value added, at 0.4 percent, behind South Africa, at 2.1 percent. South Africa's value-added growth in industry and services also lagged behind that of other middle-income countries, despite the services sector being a key driver of growth in South Africa.

FIGURE 3.12: Comparison of average annual growth in value added by sector, 1994–2018



Source: World Bank (2019)

Notes:
1. Manufacturing value added for China is only available from 2010 onwards.

3.5. Employment trends

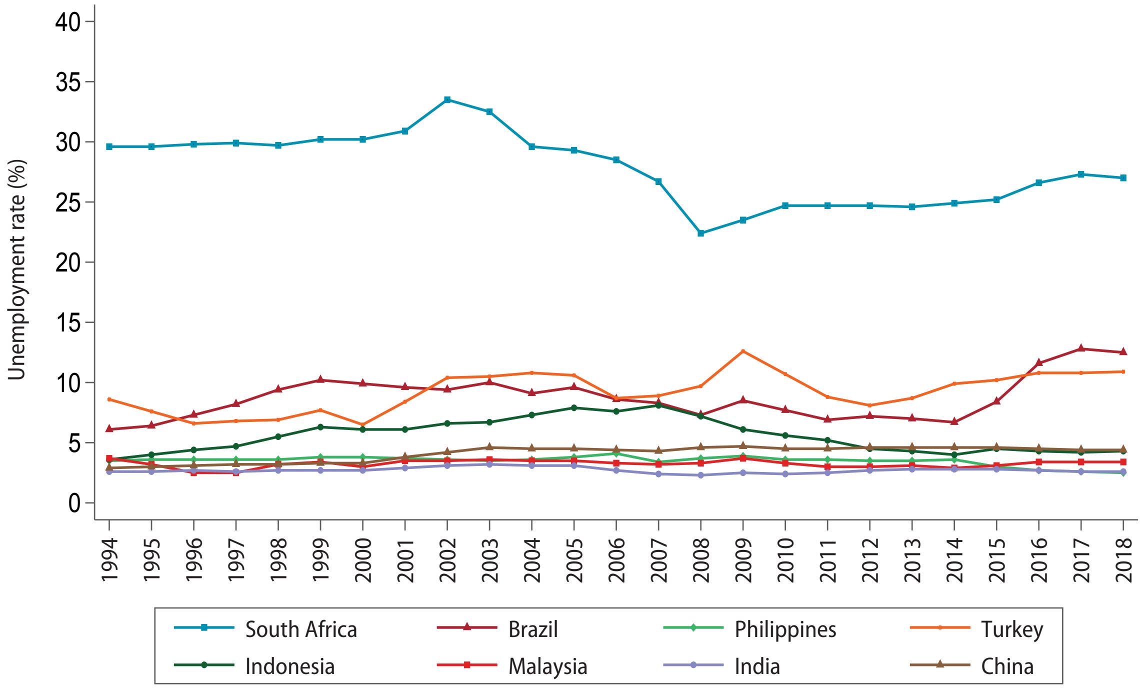
Estimates of employment and employment trends over time are an important lens through which to analyse the demand for skills. Patterns of employment across skills categories reveal employers' preferences for workers with different skill levels.

South Africa has been characterised by persistently and, within the global context, extremely high unemployment throughout the post-apartheid period. Developing countries around the world often face a significant challenge in ensuring that the economy creates a sufficient number of jobs to absorb the growing labour force into productive employment. In this regard, South Africa is no exception.

Being positioned within a low-growth trap has adversely affected South Africa's labour market and, more pressingly, its ability to generate sufficient employment opportunities for a growing labour force. As Chapter 4 will show, employment growth of 1.3 percent per annum has not been high enough to absorb a labour force that has expanded at a rate of 2.1 percent per annum since 2009. This has resulted in a rise in the number of unemployed individuals, which has increased by 4.4 percent per annum on average (both narrow and expanded unemployment). As a result, the narrow unemployment rate increased from 23.2 percent in Q2 2009 to 29.0 percent in Q2 2019, while the expanded unemployment rate, which includes the non-searching unemployed, rose from 31.7 percent to 38.5 percent over the same period.

This high unemployment rate, which has persisted throughout the post-apartheid period, exceeds the unemployment rates of selected middle-income country peers. Figure 3.13 shows South Africa's unemployment rate between 1994 and 2018 relative to these peers. South Africa's unemployment rate exhibited an upward trend between 1994 and 2003, before gradually declining until 2007, when it reached 26.7 percent. Thereafter, the unemployment rate resumed an upward trend, reaching 27.0 percent in 2018. South Africa's unemployment rate is strikingly high in comparison to the seven middle-income peers included in the figure, none of which have an unemployment rate that exceeded 10 percent over the period in question.

FIGURE 3.13: Unemployment rates across selected middle-income countries, 1994–2018



Source: World Bank (2019)

The growth path in South Africa, which is biased towards capital-intensive and high-skilled intensive[1] sectors, means that much of the labour force remains excluded from the South African economy. This is suggestive of an overall mismatch in skills demand and supply, which is explored in greater detail in subsequent sections of this report.

The labour market distortion has ultimately manifested itself in stark inequalities. Hundenborn et al. (2016) use the 1993 Project for Statistics on Living Standards and Development dataset and Wave 1 and Wave 4 of the National Income Dynamics Study to calculate the Gini coefficients for total household income and for wages and salaries (or labour income) in South Africa. Their results, presented in Table 3.2, show that high household income inequality is driven by high labour income inequality.

TABLE 3.2: Income components in per capita terms, 1993, 2008, and 2014

VARIABLE	1993	2008	2014
Total household (HH) income			
Mean of HH income	R1 328.17	R2 062.68	R2 398.57
Gini coefficient of HH income	0.68	0.69	0.66
Labour income			
Mean of labour income	R1 078.18	R1 659.86	R1 971.98
Share in total HH income	83.6%	74.5%	73.0%
Proportion of HHs receiving labour income	60.5%	64.4%	72.6%
Gini coefficient of labour income	0.73	0.76	0.73
Income from government grants			
Mean of government grants	R86.17	R161.31	R187.34
Share in total HH income	3.4%	15.6%	16.4%
Proportion of HHs receiving government grants	23.5%	56.3%	68.0%
Gini coefficient of remittances	0.92	0.78	0.76
Income from remittances			
Mean of remittance income	R50.56	R86.69	R93.94
Share in total HH income	4.6%	3.6%	6.1%
Proportion of HHs receiving remittances	22.2%	13.9%	38.3%
Gini coefficient of remittances	0.91	0.97	0.91
Investment income			
Mean of investment income	R113.28	R154.81	R145.31
Share in total HH income	8.3%	6.3%	4.5%
Proportion of HHs receiving investment income	3.5%	5.6%	23.3%
Gini coefficient of investment income	0.99	0.97	0.98

Source: Hundenborn et al. (2016)

1 'High-skilled intensive' refers to a production process that requires a large proportion of high-skilled workers in order to produce goods or services. In other words, a high-skilled intensive sector will have a relatively high skill–intensity ratio.

The main source of household income in each year is shown to be labour income. In 1993, more than four-fifths (83.6 percent) of total household income was from labour market sources. This share declined to 73.0 percent in 2014. However, the proportion of households receiving labour market income increased from 60.5 percent in 1993 to 72.6 percent of all households in 2014. The Gini coefficient for labour income remained extremely high, ranging between 0.73 and 0.76 over the period. The overall household income Gini coefficient, driven by labour income inequality, was 0.66 in 2014, down from 0.69 in 2008 and down from 0.68 in 1993. This is among the highest rates of inequality in the world, despite the slight decline since 1993.

3.6. Conclusions and implications for skills planning

This chapter has highlighted economic growth trends and shifts in the structure of the South African economy over the past 25 years. It has noted that South Africa's economic growth has been poor during this period in relation to other middle-income economies. South Africa's average annual GDP per capita growth rate of 1.2 percent for the period 1994–2018 sits well below that of other middle-income countries, such as the Philippines, Indonesia, Malaysia, India, Turkey, and China, all of which achieved growth rates in excess of 3 percent for the period.

While the economy grew at an average annual rate of 3.6 percent over the period 1994–2007, with growth rates exceeding 5 percent between 2005 and 2007 due to strong growth in resource-based exports, the economy was heavily affected by the global financial crisis in 2008, and growth rates have not yet recovered to pre-crisis levels. The low and volatile growth rates experienced since 1994 reflect an economy that is vulnerable to external shocks and significantly impacted by trends in global growth and demand. This vulnerability may be enhanced by the fact that the South African financial services industry is relatively developed and globally connected and thus susceptible to adverse shocks in international financial markets.

Economic growth in post-apartheid South Africa has been driven largely by capital-intensive industries, retail trade, and financial services, rather than by the productive and labour-intensive elements of the agriculture and manufacturing industries. The contribution to GDP of the manufacturing industry has declined over time, while that of financial services, transport, and CSP services has increased. The relative collapse of the mining industry, coupled with weak performances in the agriculture and manufacturing industries, has drastically limited the availability of regular, low-wage jobs in the country. Consequently, output generation has been forced to follow a high-skills-biased employment trajectory, one that depends on the financial services industry for growth and the retail industry and public sector for jobs.

From the perspective of the demand for skills, these trends have important implications. First, the level of demand for labour generally is constrained by low rates of economic growth. In other words, in this type of economic environment, skills demand will be biased lower. Second, since different sectors require different mixes of high-skilled, medium-skilled, and low-skilled labour, different sectoral growth rates will mean that demand for skills across these broadly defined skills categories will vary. This is the case as long as there are differences in sectoral growth, even if growth rates for different skills are identical within individual sectors. Third, sectoral growth patterns suggest that South Africa is not immune to the global phenomenon of skills-biased employment growth. In the context of a limited supply of these types of skills, the possibility of skills shortages and upward pressure on wages exists.

Importantly, sustained low levels of economic growth over the past decade have had a negative impact on employment, perpetuating high levels of unemployment and household income inequality. The weaknesses of the mining, agriculture, and manufacturing industries hinder the long-term ability of the South African economy to grow, generate employment, and improve living standards. Longer-term growth at appreciably higher levels is needed, but it would have to involve a far broader spectrum of the economy than the tertiary sector, which has to date been responsible for the bulk of employment growth in the country.

South Africa's position within a low-growth trap has adversely affected its labour market and its ability to generate sufficient employment opportunities for a growing labour force. The country's current economic growth path has not been able to generate the number and kinds of jobs required to address the unemployment crisis. In order to tackle the high rates of exclusion, unemployment, and inequality that exist in South Africa, economic growth will need to be not only boosted but also less concentrated in the services sectors.

Ultimately, the trends described in this chapter indicate that the skills demand generated by South Africa's economic growth trajectory is not aligned with the skills profile of the population. The services sector in which growth is currently concentrated cannot provide the types of jobs that are required for a labour force that is predominantly low-skilled. Greater and more diversified economic growth is necessary, and the education system must be able to equip the population with the skills on which this growth depends. Accordingly, economic and skills planning must balance the provision of job opportunities with the skills available in the population today, while also ensuring that the population attains the additional skills required for the desired level of future growth.

In this regard, better co-ordination is needed between the different government departments. This includes integrating skills development and education more explicitly, and in a more targeted manner, into growth plans and strategies. There are many strategies, policies, and initiatives – across all spheres of government – that seek to improve growth and address unemployment. Recent initiatives include the Jobs Summit and the Investment Conferences that have been undertaken at the behest of President Cyril Ramaphosa for the purpose of addressing the economic challenges facing the country. However, there is a need for a standardised and consistent approach that not only targets growth and employment but also takes into account the skills requirements and implications of such strategies.

While inter-departmental integration exists to some extent, effective co-ordination and implementation of all strategies, policies, and initiatives is essential. It is only when the system functions as an integrated whole that large-scale benefits for the country will be seen, both at the macro-economic level and at the micro-level of individuals seeking employment. In this regard, the Department of Higher Education and Training (DHET) will play an important role in ensuring that the skills requirements behind various government strategies are well understood and that appropriate responses are undertaken in line with this understanding. An example of this approach is the Priority Skills Plan (PSP), which was developed in response to the skills requirements of priority sectors, as identified in the latest iteration of the Industrial Policy Action Plan (IPAP). The PSP will be developed in tandem with 17 sectoral Master Plans that are currently being jointly developed by government and the private sector as a means of growing focused areas of the economy. The DHET, which is responsible for the PSP, is currently engaging with those involved in the development of the 17 economic Master Plans to ensure that the skills needs for expected economic growth are met. This initiative is a first for the post-apartheid government and marks the beginning of closer linkages between education and training, on the one hand, and the economy, on the other.

PART 4

The South African labour force

A productive society and economy is dependent on a skilled and capable workforce, which must be drawn from the available labour force. In South Africa, the labour force continues to be shaped by the legacy of apartheid. Two key challenges surrounding the labour force are the need to increase the skills of the labour force from a low base and the need to provide employment that can absorb the labour force, where many people remain excluded from economic activity in the country. Understanding the labour force is key to understanding the supply of skills in the country, to structuring skills planning, and, ultimately, to addressing the challenges of poverty, unemployment, and inequality.

This chapter provides an overview of the South African labour force – which includes both the employed and the unemployed – for the period Q2 2009–Q2 2019, considering demographic variables such as gender, population group, age, geographical location, and education level. The chapter also provides a focused profile of youth in the labour force, in light of the particularly high rates of unemployment for this cohort. Finally, it presents a profile of individuals who are not in employment, education, or training (NEETs).

4.1. Overview of the South African labour market

Table 4.1 presents a broad overview of the South African labour market in the second quarters of 2009 and 2019. The employed population increased from 14.4 million in Q2 2009 to 16.3 million in Q2 2019, which amounts to an average annual increase of 1.3 percent. Over the same period, however, the number of unemployed individuals increased from 4.3 million to 6.7 million, which amounts to an average annual rate of increase of 4.4 percent. Growth in unemployment has thus been higher than the increase in employment over the period in both relative terms and absolute terms (2.4 million more unemployed people compared to 1.9 million more employed people). Further, much of the working-age population (which increased by 19 percent, or 6.1 million people, over the period) would like to work but are not actively seeking work and are not actively trying to start a business. These individuals are referred to as the 'non-searching unemployed' and, between Q2 2009 and Q2 2019, their numbers grew by an average of 4.3 percent per annum, from 2.3 million to 3.6 million.

TABLE 4.1: Labour market overview, Q2 2009 and Q2 2019

	Q2 2009	Q2 2019	CHANGE		
	('000s)	('000s)	ABSOLUTE ('000s)	RELATIVE (%)	
Labour market aggregates ('000s)					
Working-age population	32 285	38 433	6 148	1.8	*
Employment	14 357	16 313	1 956	1.3	*
Narrow unemployment	4 341	6 655	2 314	4.4	*
Narrow labour force	18 698	22 968	4 270	2.1	*
Expanded unemployment	6 678	10 226	3 549	4.4	*
Expanded labour force	21 035	26 539	5 504	2.4	*
Non-searching unemployed	2 337	3 571	1 234	4.3	*
LFPR (%)					
Narrow LFPR	57.9	59.8	1.8	0.3	*
Expanded LFPR	65.2	69.1	3.9	0.6	*
Unemployment rate (%)					
Narrow unemployment rate	23.2	29.0	5.8	2.2	*
Expanded unemployment rate	31.7	38.5	6.8	2.0	*

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. The working-age population consists of those aged 15 to 64 years.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level. A t-test was used to determine whether there was a significant difference between the relative change in Q2 2009 and Q2 2019. T-tests have been used to determine significant differences between periods throughout this report.

Both the narrow and broad labour force grew more rapidly than employment did, leading to an increase in unemployment. In order to have absorbed all labour market entrants between Q2 2009 and Q2 2019, employment should have increased by 30 percent[2] over this period. The employment absorption rate[3] was, however, 46 percent for the period, with employment growing by only 13.6 percent. To put this figure into perspective, nearly five new jobs were created for every ten new job seekers.

As a result, the unemployment rate as of Q2 2019 stood at 29.0 percent, six percentage points higher than in Q2 2009. Similarly, the expanded unemployment rate was 38.5 percent as of Q2 2019, seven percentage points higher than a decade earlier.

2 This is the target growth rate. 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.

3 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:

$$T_g = \frac{\frac{L_{gt} - L_{gt-1}}{L_{gt-1}}}{T_g} = \frac{L_{gt} - L_{gt-1}}{EAP_{gt} - EAP_{gt-1}}$$

Table 4.2 shows narrow labour force participation rates (LFPRs) across various demographic categories between Q2 2009 and Q2 2019. The LFPR is the proportion of the working-age population who are economically active and who therefore form part of the labour force. In Q2 2019, 59.8 percent of the working-age population was part of the labour force, an increase from 57.9 percent in Q2 2009.[4]

TABLE 4.2: Narrow LFPR, Q2 2009 and Q2 2019

	Q2 2009 (%)	Q2 2019 (%)	CHANGE: PERCENTAGE POINTS	CHANGE: AVERAGE ANNUAL GROWTH RATE (AAGR) (%)	
Overall LFPR	***57.9***	***59.8***	***1.9***	***0.3***	*
By race					
Black African	55.4	58.7	3.3	0.6	*
Coloured	65.0	62.6	-2.4	-0.4	
Asian	59.3	59.1	-0.2	-0.0	
White	70.1	67.5	-2.6	-0.4	
By gender					
Male	65.7	66.2	0.5	0.1	
Female	50.6	53.5	2.9	0.6	*
By age group					
15–24 years	28.8	26.0	-2.8	-1.0	*
25–34 years	74.7	74.0	-0.7	-0.1	
35–44 years	77.8	80.4	2.6	0.3	*
45–54 years	70.1	75.3	5.2	0.7	*
55–64 years	43.2	45.3	2.1	0.5	
By highest level of educational attainment					
Primary or lower	46.4	47.1	0.7	0.1	
Secondary not completed	48.6	51.0	2.3	0.5	*
Secondary completed	72.0	67.7	-4.3	-0.6	*
Diploma or certificate	89.0	84.9	-4.1	-0.5	*
Degree	89.4	88.7	-0.7	-0.1	

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. The narrow definition of the labour force is utilised.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

4 An expanded LFPR can also be calculated making use of the expanded definition of unemployment. The expanded LFPR for Q2 2019 was nearly 10 percentage points higher than the narrow LFPR, at 69.1 percent.

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The increase in the overall LFPR was driven entirely by increased participation among black Africans; the black African LFPR increased by 3.3 percentage points, from 55.4 percent to 58.7 percent. By contrast, labour force participation among whites and coloureds fell by 2.6 percentage points and 2.4 percentage points, respectively. Nevertheless, participation rates among whites (67.5 percent) and coloureds (62.6 percent) remained higher than those among Asians (59.1 percent) and black Africans (58.7 percent).

There is a clear gender gap in terms of labour force participation, with men substantially more likely to be economically active than women. In Q2 2019, the male LFPR was 66.2 percent, compared to 53.5 percent for women. However, over the 10-year period, the female LFPR increased by 2.9 percentage points, compared to just 0.5 percentage points for men, suggesting a narrowing of the gender gap in participation rates over time.

In terms of age, LFPRs reached a peak of 80.4 percent in the 35–44 years cohort in Q2 2019. The LFPR then decreased for each successive age group. The LFPR was lowest among 15- to 24-year-olds (26.0 percent) and 55- to 64-year-olds (45.3 percent). The youngest two cohorts (15–24 years and 25–34 years) saw their participation rates decline between Q2 2009 and Q2 2019, while the three oldest cohorts experienced an increase over the same period, with the participation rate for 45- to 54-year-olds rising the most (with an increase of 5.2 percent).

In Q2 2019, the LFPR was higher for individuals with higher levels of educational attainment. Individuals with primary or lower education (47.1 percent) and incomplete secondary education (51.0 percent) had relatively low LFPRs. Those with a diploma or certificate (84.9 percent) or a degree (88.7 percent) had the highest LFPRs. However, between Q2 2009 and Q2 2019, the LFPR decreased for all educational groups, with the exception of those with primary or lower education and those with incomplete secondary education.

4.1.1. The employed

Table 4.3 presents the profile of the employed in Q2 2009 and Q2 2019 by population group, gender, age group, and educational attainment level. As of Q2 2019, the black African population accounted for three-quarters (75.1 percent) of the total employed, up from 70.5 percent in Q2 2009. Whites accounted for 11.3 percent (down from 15.2 percent), coloureds for 10.3 percent (down from 11.1 percent), and Asians for 3.3 percent (unchanged). In terms of gender, the mix of employment was virtually unchanged between 2009 and 2019, with men accounting for 56.3 percent of employment and women accounting for 43.7 percent of employment.

TABLE 4.3: Employment by demographic characteristics, Q2 2009 and Q2 2019

	NUMBER OF EMPLOYED		SHARE OF EMPLOYED		CHANGE IN EMPLOYED			
	Q2 2009 ('000s)	Q2 2019 ('000s)	Q2 2009 (%)	Q2 2019 (%)	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)	
Total	*14 357*	*16 313*	*100.0*	*100.0*	*1 956*	*100.0*	*1.3*	*
By race								
Black African	10 119	12 250	70.5	75.1	2 132	109.0	1.9	*
Coloured	1 588	1 687	11.1	10.3	98	5.0	0.6	
Asian	474	530	3.3	3.3	57	2.9	1.1	
White	2 176	1 845	15.2	11.3	-331	-16.9	-1.6	*
By gender								
Male	8 096	9 180	56.4	56.3	1 083	55.4	1.3	*
Female	6 261	7 133	43.6	43.7	873	44.6	1.3	*
By age group								
15–24 years	1 463	1 168	10.2	7.2	-295	-15.1	-2.2	*
25–34 years	4 691	4 797	32.7	29.4	106	5.4	0.2	*
35–44 years	4 199	5 088	29.2	31.2	888	45.4	1.9	*
45–54 years	2 838	3 661	19.8	22.4	824	42.1	2.6	*
55–64 years	1 166	1 599	8.1	9.8	433	22.1	3.2	*
By highest level of educational attainment								
Primary or lower	2 628	1 880	18.3	11.5	-748	-38.2	-3.3	*
Secondary not completed	4 773	5 361	33.2	32.9	588	30.1	1.2	*
Secondary completed	4 148	5 347	28.9	32.8	1 199	61.3	2.6	*
Diploma or certificate	1 678	2 019	11.7	12.4	341	17.4	1.9	*
Degree	994	1 492	6.9	9.1	498	25.5	4.1	*

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. Education category numbers do not add up to total employment due to unspecified or no responses.
2. An asterisk denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

The bulk of the employed were between the ages of 25 and 44, with these cohorts accounting for 60 percent of employment in Q2 2019. The share of 25- to 34-year-olds declined from 32.7 percent in Q2 2009 to 29.4 percent in Q2 2019, while that of 35- to 44-year-olds increased from 29.2 percent in Q2 2009 to 31.2 percent in Q2 2019. The two oldest cohorts also grew relative to the total employed population. A striking change is the decline in the share of employment accounted for by those between the ages of 15 and 24: employment for this cohort declined from 1.5 million employed people to 1.2 million employed people, resulting in a 3 percentage-point fall in their share of employment, from 10.2 percent in Q2 2009 to 7.2 percent in Q2 2019.

There has been a significant decline in the number of employed with primary or lower education, from 2.6 million in Q2 2009 to 1.9 million in Q2 2019, reducing this cohort's share of total employment over the period from 18.3 percent to 11.5 percent. This decline may be linked to the fact that individuals with such low levels of education tend to be older and may thus be exiting the labour force in greater numbers as they reach retirement. The largest absolute increase in employment is observed for those who have completed secondary education. Employment for this cohort increased from 4.1 million employed people in Q2 2009 to 5.3 million employed people in Q2 2019, increasing its share from 28.9 percent to 32.8 percent over the period. There has also been a significant increase in the number of employed workers with degrees, from under 1 million in Q2 2009 to 1.9 million in Q2 2019.

4.1.2. The unemployed

Table 4.4 profiles the unemployed in Q2 2009 and Q2 2019, by population group, gender, age, and education level. Black Africans accounted for 89.4 percent of the unemployed in Q2 2019 and for 93.1 percent of the increase in unemployment over the decade in question. Coloureds accounted for 4.6 percent and whites for 1.9 percent of the increase. In Q2 2019, these two groups accounted for 7.3 percent and 2.2 percent of the unemployed, respectively. The narrow unemployment rate in Q2 2019 was highest for black Africans, at 32.7 percent, and coloureds, at 22.5 percent, followed by 11.2 percent for Asians and 7.4 percent for whites. The gender composition of unemployment in Q2 2019 was unchanged from 10 years earlier, with men accounting for 51.1 percent of the unemployed. Women were more likely than men to be unemployed in both periods: in Q2 2019, the unemployment rate for women was 31.3 percent, compared to 27.1 percent for men.

TABLE 4.4: Narrow unemployment by demographic characteristics, Q2 2009 and Q2 2019

	NUMBER OF UNEMPLOYED						SHARE OF UNEMPLOYED		UNEMPLOYMENT RATE	
	Q2 2009 ('000s)	Q2 2019 ('000s)	CHANGE ('000s)	CHANGE SHARE (%)	CHANGE AAGR (%)		Q2 2009 (%)	Q2 2019 (%)	Q2 2009 (%)	Q2 2019 (%)
Total	*4 341*	*6 655*	*2 314*	*100.0*	*4.4*	*	*100.0*	*100.0*	*23.2*	*28.9*
By race										
Black African	3 796	5 951	2 154	93.1	4.6	*	87.5	89.4	27.3	32.7
Coloured	383	489	106	4.6	2.5	*	8.8	7.3	19.4	22.5
Asian	58	67	9	0.4	1.5		1.3	1.0	10.9	11.2
White	104	148	45	1.9	3.6		2.4	2.2	4.6	7.4
By gender										
Male	2 223	3 406	1 182	51.1	4.4	*	51.2	51.2	21.5	27.1
Female	2 118	3 250	1 132	48.9	4.4	*	48.8	48.8	25.3	31.3
By age group										
15–24 years	1 370	1 511	141	6.1	1.0	†	31.6	22.7	48.4	56.4
25–34 years	1 755	2 655	899	38.9	4.2	*	40.4	39.9	27.2	35.6
35–44 years	793	1 545	752	32.5	6.9	*	18.3	23.2	15.9	23.3
45–54 years	356	758	403	17.4	7.9	*	8.2	11.4	11.1	17.2
55–64 years	67	187	120	5.2	10.8	*	1.6	2.8	5.5	10.5
By highest level of educational attainment										
Primary or lower	731	703	-28	-1.2	-0.4		16.8	10.6	21.8	27.2
Secondary not completed	1 947	3 102	1 155	49.9	4.8	*	44.8	46.6	29.0	36.7
Secondary completed	1 408	2 224	816	35.3	4.7	*	32.4	33.4	25.3	29.4
Diploma or certificate	188	447	259	11.2	9.1	*	4.3	6.7	10.1	18.1
Degree	38	149	111	4.8	14.5	*	0.9	2.2	3.7	9.1

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. Education category numbers do not add up to total employment due to unspecified or no responses.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

In terms of age, the bulk of the unemployed were between the ages of 25 and 34 (39.9 percent), with the number of unemployed in this cohort increasing from 1.8 million in Q2 2009 to 2.7 million in Q2 2019. Those between the ages of 15 and 24 accounted for 23 percent of the unemployed, a decrease in share from 31.6 percent in Q2 2009, despite the number of unemployed people within this cohort increasing from 1.4 million in Q2 2009 to 1.5 million in Q2 2019. The proportion of the unemployed aged 35–44 also increased significantly, from 18.3 percent in Q2 2009 to 23.2 percent in Q2 2019 (1.5 million unemployed individuals in Q2 2019, up from 790 000 a decade earlier). The two oldest age cohorts also saw an increase, both in absolute numbers and in share. The unemployment rate in Q2 2019 was highest for the youngest age cohorts: for 15- to 24-year-olds it was 56.4 percent, and for 25- to 34-year-olds it was 35.6 percent. Unemployed youth are profiled in more detail in Section 4.2.3. By contrast, the unemployment rate was lowest for those aged 55–64, at 10.5 percent.

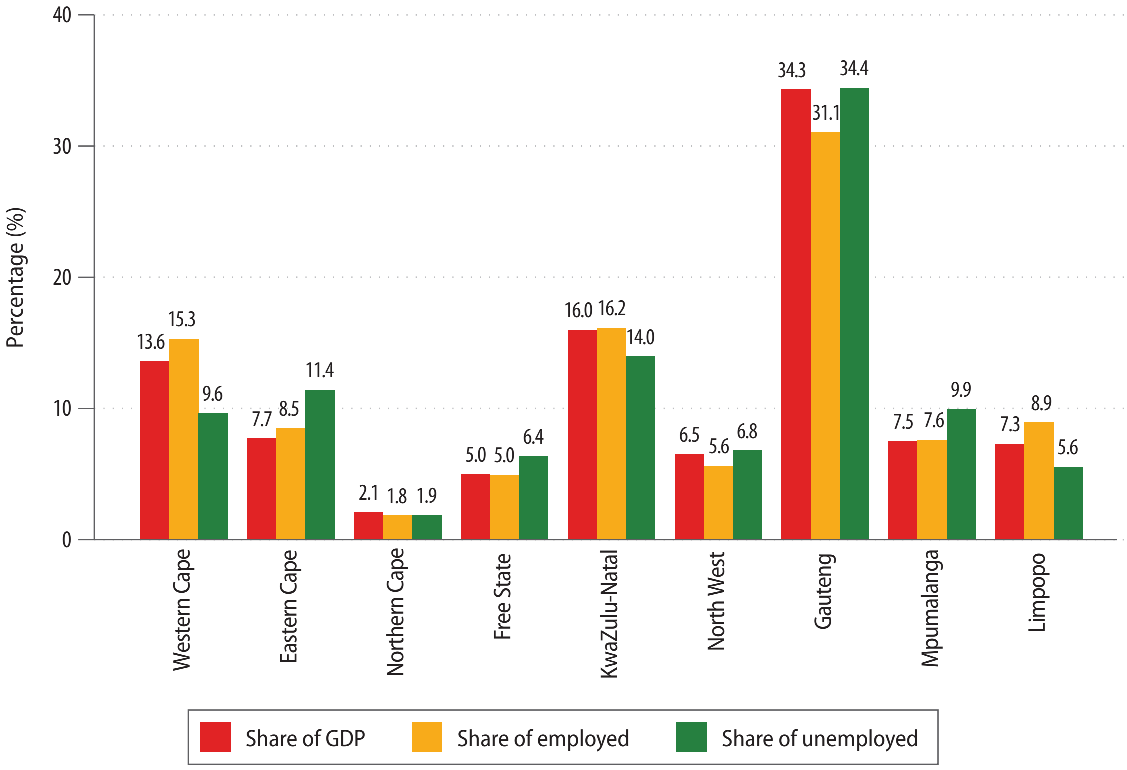
There was a decline in the number and share of the unemployed with primary or lower education (from 16.8 percent in Q2 2009 to 10.6 percent in Q2 2019). This decline, again, may be reflective of falling numbers of individuals in the population with this level of education. There was an increase in unemployment for all other education groups, with the greatest increase in absolute terms seen among those with incomplete secondary education (an increase of 1.2 million individuals, accounting for almost half of the increase in unemployment over the decade). While accounting for relatively smaller portions of the increase, the high growth rate in unemployment among those with diplomas and degrees remains of concern. The number of unemployed graduates increased from 38 000 in Q2 2009 to 149 000 in Q2 2019 – a more than six-fold increase.

Those with incomplete secondary education had the highest unemployment rate, at 36.7 percent in Q2 2019, followed by those with completed secondary education (29.4 percent) and those with primary or lower education (27.2 percent). The unemployment rate was lowest for those with diplomas or certificates (18.1 percent) and those with degrees (9.1 percent). The unemployment rate increased for each educational group over the decade, with a sharp increase seen among individuals with degrees (from 3.7 percent in Q2 2009 to 9.1 percent in Q2 2019). Meanwhile, the unemployment rate for those with diplomas or certificates increased from 10.1 percent to 18.1 percent over the period.

4.1.3. The spatial distribution of the employed and unemployed

There is significant variation in employment across the different provinces of South Africa. Figure 4.1 shows the shares of total GDP, employment, and unemployment in each of the nine provinces. Economic activity is concentrated in three provinces: namely, Gauteng, KwaZulu-Natal, and the Western Cape. These three provinces are the only provinces that individually account for more than 10 percent of GDP, with Gauteng accounting for around one-third of the country's economic output. Collectively, these three provinces account for around two-thirds of GDP. The Northern Cape, the Free State, and the North West are the smallest contributors to GDP in the country.

FIGURE 4.1: Share of provincial GDP, employment, and unemployment, Q2 2019



Source: Stats SA (2019a)

Notes:

1. Employment and narrow unemployment shares are calculated for Q2 2019. Shares of GDP are calculated using the most recently available GDP provincial data (for 2017).

Employment is strongly related to the GDP of the provinces, with employment in Gauteng, KwaZulu-Natal, and the Western Cape accounting for the largest shares of national employment. The shares of national employment are lowest in the Northern Cape, the Free State, and the North West. Three provinces – the Eastern Cape, Mpumalanga, and the Free State – account for considerably larger shares of unemployment than of employment, with higher unemployment rates than the national average evident in these provinces. By contrast, the share of unemployment is lower than the share of employment in only two provinces: KwaZulu-Natal and the Western Cape. This is suggestive of a relatively higher likelihood of finding employment in these provinces. However, it should be noted that the definition of unemployment used here is the official definition, which excludes the non-searching unemployed. Thus, these patterns may be – and indeed are – different when the expanded definition of unemployment is used instead.

Despite the differences across provinces, no province remains unaffected by the unemployment crisis. However, the particular challenges associated with creating jobs in order to absorb the unemployed may differ across provinces to some extent, given each province's particular economic, social, and demographic characteristics. While these provincial particularities are not considered in the remainder of the report, they should be borne in mind when interventions aimed at stimulating growth and addressing skills needs across different parts of the country are considered. The various Labour Market Intelligence Programme (LMIP) outputs related to province-specific skills needs and challenges will produce findings that are nuanced in this regard. These findings will be incorporated into subsequent iterations of this report.

4.2. The youth labour market

South Africa has a fairly young population, with 63.9 percent of the population under the age of 35 (Stats SA, 2019a). A total of 44 percent of the South African labour force is categorised as youth (between the ages of 15 and 34). Within this cohort, the unemployment rate for those aged between 15 and 24 was 56 percent in Q2 2019, up from 48 percent in Q2 2009. The unemployment rate for those between the ages of 25 and 34 was 36 percent in Q2 2019, up from 27 percent in Q2 2009. Given these particularly high and rising rates of unemployment, this section specifically focuses on South African youth and their prospects for employment. The section first presents a high-level overview of the youth labour force, before considering the demographic characteristics and education levels of young people in South Africa.

4.2.1. Overview of the youth labour market

Table 4.5 presents a broad overview of the South African youth labour market (comprising those aged 15–34) in Q2 2009 and Q2 2019. The employed youth population decreased in size from 6.2 million in Q2 2009 to 6.0 million in Q2 2019, while the number of unemployed youths increased from 3.1 million to 4.2 million. In other words, not only did the number of employed youths decrease by 200 000, but there were also close to 1.1 million more unemployed youth in Q2 2019 than there were in Q2 2009. Although the working-age population expanded by 1.9 million people between Q2 2009 and Q2 2019, the increase in unemployment of nearly 1.1 million people over the same period suggests that it has become increasingly difficult for young people to find jobs.

TABLE 4.5: Youth labour market overview, Q2 2009 and Q2 2019

	Q2 2009 ('000s)	Q2 2019 ('000s)	CHANGE ABSOLUTE ('000s)	AAGR (%)	
Labour market aggregates ('000s)					
Working-age population	18 454	20 363	1 909	1.0	*
Employment	6 154	5 965	-189	-0.3	
Narrow unemployment	3 125	4 165	1 040	2.9	*
Narrow labour force	9 279	10 130	851	0.9	*
Expanded unemployment	4 758	6 450	1 692	3.1	*
Expanded labour force	10 912	12 414	1 503	1.3	*
Non-searching unemployed	1 633	2 285	652	3.4	*
LFPR (%)					
Narrow LFPR	50.3	49.7	-0.5	-0.1	
Expanded LFPR	59.1	61.0	1.8	0.3	*
Unemployment rate (%)					
Narrow unemployment rate	33.7	41.1	7.4	2.0	*
Expanded unemployment rate	43.6	52.0	8.4	1.8	*

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:

1. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

The overall youth unemployment rate of 41.1 percent in Q2 2019 was 7.4 percentage points higher than in Q2 2009, indicating a sclerotic labour market that has not been able to provide a sufficient number of jobs for youth. The expanded youth unemployment rate of 52.0 percent indicates that more than half the youth in South Africa who are willing, available, and able to work do not have a job, reinforcing the notion that the South African labour market is not creating sufficient job opportunities for young people in the country.

Table 4.6 shows the LFPR of youth across various demographic categories between Q2 2009 and Q2 2019. Overall, the youth LFPR was 49.7 percent in Q2 2019, marginally lower than ten years earlier. In Q2 2019, youth LFPRs were highest among coloureds (57.8 percent) and whites (56.1 percent) and lowest among black Africans (48.4 percent). Male youth had a higher LFPR (54.3 percent) than female youth did (45.1 percent).

TABLE 4.6: Youth LFPR, Q2 2009 and Q2 2019

	Q2 2009 (%)	Q2 2019 (%)	CHANGE PERCENTAGE POINTS	CHANGE AAGR (%)	
Overall LFPR	***50.3***	***49.7***	***-0.5***	***-0.1***	
By race					
Black African	48.2	48.4	0.3	0.1	
Coloured	62.2	57.8	-4.3	-0.7	†
Asian	57.3	54.2	-3.1	-0.6	
White	58.6	56.1	-2.5	-0.4	
By gender					
Male	55.9	54.3	-1.6	-0.3	
Female	44.7	45.1	0.4	0.1	
By age group					
15–19 years	8.1	5.2	-3.0	-4.4	*
20–24 years	50.8	46.2	-4.6	-0.9	*
25–29 years	72.8	70.6	-2.2	-0.3	†
30–34 years	76.8	77.7	0.8	0.1	
By highest level of educational attainment					
Primary or lower	37.6	38.0	0.4	0.1	
Secondary not completed	38.7	39.4	0.7	0.2	
Secondary completed	67.4	59.7	-7.6	-1.2	*
Diploma or certificate	88.9	82.4	-6.4	-0.7	*
Degree	87.8	87.4	-0.4	0.0	

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. The narrow definition of the labour force is utilised.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

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Labour force participation increases with age, from 5.2 percent for 15- to 19-year-olds in Q2 2019 to 46.8 percent for 20- to 24-year-olds, and to over 70 percent for those between the ages of 25 and 34. These three younger cohorts all saw statistically significant declines in their participation rates over the course of the decade. Similarly, participation rates are positively associated with educational attainment: those with higher levels of education are more likely to be economically active. In Q2 2019, the participation rate was highest for those with degrees (87.4 percent) and those with diplomas or certificates (82.4 percent), falling to 59.7 percent for those with completed secondary education and to just under 40 percent for those with lower levels of educational attainment. The only statistically significant changes in participation rates over the period occurred for those with completed secondary education (-7.6 percentage points) and for those with diplomas or certificates (-6.4 percentage points).

4.2.2. Employed youth

Table 4.7 shows the profile of employed youth by population, gender, age group, and level of educational attainment in Q2 2009 and Q2 2019. Black Africans made up more than three-quarters (76.2 percent) of employed youth in Q2 2019, a slight increase from 74.1 percent in Q2 2009. Coloureds and Asians saw their shares decline to 11.1 percent and 3.4 percent of youth employment, respectively, although these declines are marginal and not statistically significant. The largest decline occurred for whites, whose share declined by 1.6 percentage points between Q2 2009 and Q2 2019. The composition by gender was unchanged between Q2 2009 and Q2 2019, with male and female youth respectively constituting 58.2 percent and 41.8 percent of total youth employment.

In terms of age cohorts, the oldest among the youth (those aged 30–34) accounted for the largest share of youth employment, at 44.2 percent. This cohort was also the only cohort to increase its share of employment over the period, perhaps reflecting the premium that employers place on job experience, but also possibly reflecting the gradual ageing of the population. The share of 25- to 29-year-olds in youth employment remained unchanged, while that of 20- to 24-year-olds declined from 21.0 percent in Q2 2009 to 18.1 percent in Q2 2019. The cohort of 15- to 19-year-olds saw its share of employment fall by 1.3 percentage points over the decade.

As far as educational attainment is concerned, 222 000 fewer youth with primary or lower education were employed in Q2 2019 compared to Q2 2009. The share of this cohort in employment correspondingly declined from 9.9 percent to 6.5 percent. Likewise, the number of individuals with a diploma or certificate declined by 67 000 to 650 000 in Q2 2019, reducing this group's share of employment from 11.6 percent to 10.9 percent. The main beneficiaries in terms of employment were those with degrees, who increased their share of youth employment from 4.9 percent to 8.0 percent. Employment among this group grew by 174 000 jobs over the decade, to 474 000.

TABLE 4.7: Youth employment, Q2 2009 and Q2 2019

	NUMBER OF EMPLOYED		SHARE OF EMPLOYED		CHANGE IN EMPLOYED			
	Q2 2009 ('000s)	Q2 2019 ('000s)	2009 (%)	2019 (%)	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)	
Total	***6 154***	***5 965***	***100.0***	***100.0***	***-189***	***100.0***	***-0.3***	
By race								
Black African	4 562	4 546	74.1	76.2	-16	8.2	0.0	
Coloured	707	659	11.5	11.1	-48	25.5	-0.7	
Asian	215	203	3.5	3.4	-12	6.3	-0.6	
White	669	556	10.9	9.3	-114	60.0	-1.8	*
By gender								
Male	3 589	3 471	58.3	58.2	-118	62.3	-0.3	
Female	2 565	2 494	41.7	41.8	-71	37.7	-0.3	
By age group								
15–19 years	172	90	2.8	1.5	-82	43.4	-6.3	*
20–24 years	1 291	1 078	21.0	18.1	-213	112.7	-1.8	*
25–29 years	2 261	2 160	36.7	36.2	-101	53.3	-0.5	*
30–34 years	2 430	2 637	39.5	44.2	207	-109.4	0.8	*
By highest level of educational attainment								
Primary or lower	612	390	9.9	6.5	-222	117.4	-4.4	*
Secondary not completed	2 191	2 093	35.6	35.1	-99	52.2	-0.5	
Secondary completed	2 291	2 306	37.2	38.7	15	-8.1	0.1	
Diploma or certificate	717	650	11.6	10.9	-67	35.3	-1.0	
Degree	300	474	4.9	8.0	174	-91.8	4.7	*

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. Education category numbers do not add up to total employment due to unspecified or no responses.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

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4.2.3. Unemployed youth

Table 4.8 shows the profile of the unemployed between the ages of 15 and 34. Overall, the number of unemployed youth increased by 1 million between Q2 2009 and Q2 2019, reaching almost 4.2 million by the end of the period. This represents an average rate of increase of 2.9 percent per annum. Black Africans have borne the brunt of the increase in youth unemployment, with 95 percent of the increase in youth unemployment accounted for by this group. In absolute terms, the number of unemployed youth increased for all race groups – with the exception of Asians – over the decade. The gender composition of youth unemployment remained largely unchanged between Q2 2009 and Q2 2019, with male youth accounting for 50.9 percent and female youth accounting for 49.1 percent of unemployed youth.

With the exception of 15- to 19-year-olds, all youth age cohorts experienced an increase in absolute unemployment levels. The increase was particularly noticeable for those aged 25–29 and 30–34, who together accounted for over 85 percent of the increase in unemployment among youth.

In terms of educational attainment, youth with either incomplete or completed secondary education accounted for four-fifths of the increase in youth unemployment between 2009 and 2019. However, neither of these groups saw their share of unemployed youth increase. There was an increase in the share of unemployed youth who held a diploma or certificate or a degree. However, the shares for these groups were relatively small, at 6.6 percent and 3.8 percent, respectively.

The youth unemployment rate increased by 7.4 percentage points, from 33.7 percent to 41.1 percent, between Q2 2009 and Q2 2019. Black African youth experienced the largest increase in their unemployment rate, which rose by 7.5 percentage points over the decade to 45.1 percent. They were followed by coloureds, with a 4.2 percentage point increase to 32.2 percent. The unemployment rate for white youth was 12.1 percent in Q2 2019, up 3.7 percentage points over the decade, while the unemployment rate for Asian youth was virtually unchanged, at 15.3 percent.

The youth unemployment rate was higher for female youth (45.1 percent) than for male youth (37.9 percent), with both genders seeing increases in excess of 7 percentage points. All age groups experienced increases in their unemployment rates, with 25- to 29-year-olds seeing an increase of 9.7 percentage points. The majority of the economically active population aged 15–19 and 20–24 were unemployed in Q2 2019 (65.7 percent and 55.4 percent, respectively). These rates decline to 41.2 percent for 25- to 29-year-olds and to 30.2 percent for 30- to 34-year-olds.

TABLE 4.8: Youth unemployment by demographic characteristics, Q2 2009 and Q2 2019

	NUMBER OF UNEMPLOYED						SHARE OF UNEMPLOYED		UNEMPLOYMENT RATE	
	2009 ('000s)	2019 ('000s)	('000s)	SHARE OF CHANGE (%)	AAGR (%)		2009 (%)	2019 (%)	2009 (%)	2019 (%)
Total	***3 125***	***4 165***	***1 040***	***100.0***	***2.9***	*	***100.0***	***100.0***	***33.7***	***41.1***
By race										
Black African	2 750	3 739	990	95.1	3.1	*	88.0	89.8	37.6	45.1
Coloured	275	313	38	3.6	1.3		8.8	7.5	28.0	32.2
Asian	39	37	-3	-0.2	-0.7		1.3	0.9	15.5	15.3
White	61	76	15	1.5	2.3		2.0	1.8	8.3	12.1
By gender										
Male	1 568	2 120	552	53.1	3.1	*	50.2	50.9	30.4	37.9
Female	1 558	2 046	488	46.9	2.8	*	49.8	49.1	37.8	45.1
By age group										
15–19 years	240	173	-67	-6.5	-3.2	*	7.7	4.1	58.2	65.7
20–24 years	1 130	1 338	208	20.0	1.7	*	36.2	32.1	46.7	55.4
25–29 years	1 039	1 512	474	45.6	3.8	*	33.2	36.3	31.5	41.2
30–34 years	717	1 142	426	40.9	4.8	*	22.9	27.4	22.8	30.2
By highest level of educational attainment										
Primary or lower	331	295	-36	-3.4	-1.1		10.6	7.1	35.1	43.1
Secondary not completed	1 434	1 901	467	44.9	2.9	*	45.9	45.6	39.6	47.6
Secondary completed	1 170	1 553	383	36.8	2.9	*	37.5	37.3	33.8	40.2
Diploma or certificate	140	311	171	16.4	8.3	*	4.5	7.5	16.3	32.4
Degree	29	93	63	6.1	12.1	*	0.9	2.2	8.9	16.3

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. Education category numbers do not add up to total unemployment due to unspecified or no responses.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

Between Q2 2009 and Q2 2019, the largest increases in the unemployment rate by educational attainment occurred among those with diplomas or certificates (16.9 percentage points). Nevertheless, this group still has the second lowest unemployment rate (32.4 percent), lower than that of all other educational cohorts besides those with degrees (16.3 percent).

Overall, the profile of youth unemployment reveals some concerning trends. The unemployment rate increased for almost all the groups considered over the Q2 2009–Q2 2019 period. The increase in unemployment for those with degrees, from 29 000 unemployed people in 2009 to 93 000 unemployed people in 2019, is a particularly concerning trend, given that individuals pursue higher education (HE) with the expectation that these qualifications will improve their odds of finding employment. It appears that the increase in the number of youth with degrees has not been met with a corresponding increase in available jobs for university graduates. Despite the overall rise in the number and share of employed youth with degrees, as noted earlier, this increase has not been sufficient to keep pace with growth in the number of jobseekers, resulting in higher unemployment. In other words, both employment *and* unemployment are growing among degree-holding youth.

4.3. Individuals not in employment, education, or training

The concept of NEETs – individuals not in employment, education, or training – arose in the 1980s as a method for measuring the prevalence of labour market vulnerability, especially among youth.[5] A high proportion of NEETs is concerning in that it represents not only a loss of earnings but also a waste of human capital (Quintano et al., 2018). Furthermore, a study of South African NEETs showed that this group experienced higher rates of depression and lower levels of self-reported happiness and were more reliant on grant income than individuals who were not long-term NEETs (Branson, De Annoy, & Kahn, 2018).

Between Q2 2013 and Q2 2019, the number of NEETs in South Africa increased by 1.9 million (Table 4.9), with 91 percent of the increase accounted for by black Africans, followed by coloureds, Asians, and whites. All four race groups experienced an increase in the number of NEETs, with the greatest average annual change experienced by Asians (3.0 percent), followed by black Africans (2.2 percent) and coloureds (1.2 percent).

5 In line with the Department of Higher Education and Training, which is responsible for the entire post-school and education and training system, this section focuses on NEETs in the entire working-age population (15- to 64-year-olds).

TABLE 4.9: NEETs by demographic characteristics, Q2 2013 and Q2 2019

	Q2 2013 ('000s)	Q2 2019 ('000s)	NEET RATE 2013	NEET RATE 2019	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)	
Overall NEETs	***14 056***	***15 870***	***40.5***	***41.3***	***1 814***	***100.0***	***2.0***	*
By race								
Black African	11 733	13 384	42.8	43.2	1 651	91.0	2.2	*
Coloured	1 293	1 386	40.0	39.9	94	5.2	1.2	†
Asian	308	367	32.4	36.3	60	3.3	3.0	†
White	723	732	23.0	24.8	9	0.5	0.2	
By gender								
Male	5 787	6 783	33.9	35.7	997	55.0	2.7	*
Female	8 270	9 086	46.8	46.8	817	45.0	1.6	*
By age group								
15–24 years	3 345	3 327	32.8	32.3	-19	-1.0	-0.1	
25–34 years	4 185	4 883	45.8	48.5	697	38.5	2.6	*
35–44 years	2 635	3 120	36.5	37.8	484	26.7	2.9	*
45–54 years	1 908	2 197	38.9	37.4	289	15.9	2.4	*
55–64 years	1 982	2 343	61.0	59.4	362	19.9	2.8	*
By highest level of educational attainment								
Primary or lower	3 544	3 033	56.5	55.3	-511	-28.2	-2.6	*
Secondary not completed	6 287	7 175	40.9	43.2	888	49.0	2.2	*
Secondary completed	3 422	4 446	38.3	39.7	1 025	56.5	4.5	*
Diploma or certificate	526	765	21.4	26.3	239	13.2	6.4	*
Degree	174	307	12.4	16.6	133	7.3	9.9	*

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Education category numbers do not add up to total employment due to unspecified or no responses.
2. An asterisk (*) denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.
3. The NEETs variable only became available in the Q3 2012 QLFS. Since we are using Q2 data, Q2 2013 was the earliest period for which the data could be used.
4. The NEET rate is calculated by dividing the number of individuals in a given group who are NEET by the working-age population of that group.

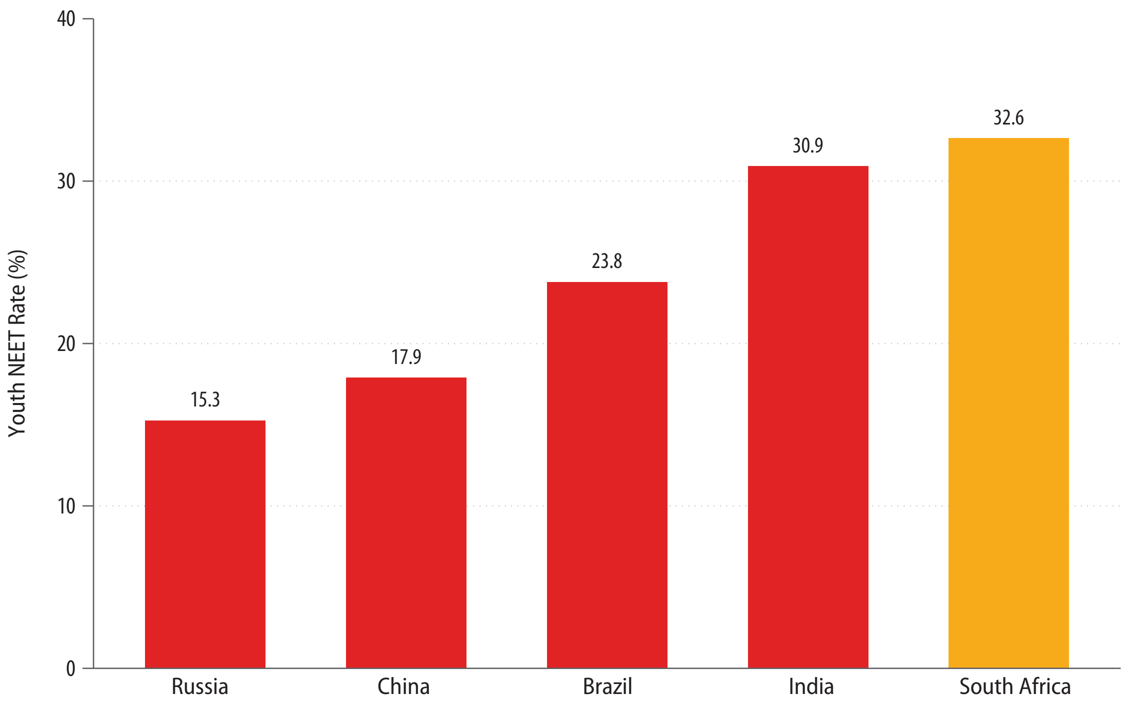
There were approximately 2.3 million more female than male NEETs in Q2 2019. However, between Q3 2013 and Q2 2019, the increase in the number of NEETs was larger in absolute terms for men (1 million) than for women (0.9 million). Overall, 55 percent of the increase in the number of NEETs over the period was attributable to men, compared to 45 percent for women.

With the exception of 15- to 24-year-olds, all age groups experienced an increase in the number of individuals classified as NEETs. 35- to 44-year-olds and 55- to 64-year-olds experienced the greatest increases in the number of NEETs within their cohorts (2.9 percent per year and 2.8 percent per year, respectively). The third most notable increase in NEETs was among those aged 25–34 (2.6 percent per year). These increases perhaps reflect the tough economic conditions in South Africa over the period in question, with employment remaining under significant pressure.

In terms of educational categories, those with degrees experienced the greatest increase (9.9 percent per year) in their NEET population, followed by those with diplomas or certificates (6.4 percent per year). Among those with primary or lower education, the number of NEETs declined.

The high proportion of NEETs in South Africa is highlighted by Figure 4.2, which shows the NEET rate for 15- to 24-year-olds in South Africa relative to other BRICS countries. South Africa has the highest youth NEET rate (32.6 percent) among the five countries, slightly higher than the 30.9 percent observed in India. South Africa's youth NEET rate is more than double that of Russia, which stands at 15.3 percent.

FIGURE 4.2: Youth NEET rate, 2019



Source: Own calculations, ILOSTAT (2019)

4.4. Conclusions and implications for skills planning

This chapter has provided an overview of the characteristics of the employed and unemployed, with a particular focus on the youth labour force. As of Q2 2019, there were 16.3 million people who were employed and 6.7 million who were unemployed, according to the narrow definition of unemployment. If the expanded definition is used, the number of unemployed rises to 10.2 million people. Three-quarters of the employed and nine in ten of the unemployed are black African.

While the education level across the labour force increased between Q2 2009 and Q2 2019 – with a significant decline in the number of employed holding primary or lower education, from 2.6 million in Q2 2009 to 1.9 million in Q2 2019 – the labour force remains predominantly low-skilled, with 44.4 percent of the employed, and 57.2 percent of the unemployed, having an educational attainment level below completed secondary school. As noted in the previous chapter, the economy is not generating the jobs that are required by this predominantly low-skilled labour force.

Those aged between 15 and 34 (youth) had the highest rate of unemployment in Q2 2019, at 41.1 percent (or 52.0 percent using the expanded definition of unemployment). These individuals account for 45 percent of the increase in the unemployed between Q2 2009 and Q2 2019. Black Africans have borne the brunt of the increase in youth unemployment, accounting for 95 percent of this increase.

A concerning trend is the rise in the number of unemployed individuals with tertiary qualifications. While the number of the employed who hold degrees has increased substantially between Q2 2009 and Q2 2019 (from 994 000 to 1.49 million), so too has the number who are unemployed (from 38 000 to 149 000). Over two-thirds (93 000) of these unemployed individuals with degrees are youth. It appears that the increase in the number of youth with degrees has not been met with a corresponding increase in available jobs for university graduates.

The high numbers of unemployed individuals and NEETs are symptomatic of the imbalances that exist between the demand for and the supply of skills. They indicate an important role for the community education and training (CET) sector and for Sectoral Education and Training Authorities (SETAs), while also reinforcing the pressing need for economic growth to generate jobs for those who remain excluded from the labour market and from meaningful participation in the economy.

The large numbers of individuals in the labour force with incomplete schooling also point specifically to the role that could be played by the CET subsector. CET colleges are intended to cater mainly for youths and adults who did not complete their schooling and therefore do not qualify to study at higher education institutions (HEIs). While previously aimed at improving adult literacy and numeracy skills, CET colleges are increasingly becoming institutions that offer young NEETs "second-chance" opportunities to improve their labour market prospects. For those with lower levels of schooling, the post-school education and training (PSET) system can play a part in enabling the attainment of basic skills through, for example, the General Education and Training Certificate: Adult Basic Education and Training (GETC: ABET) qualification.

SETAs may also have a role to play in improving the labour market prospects of individuals. By facilitating workplace-based education and training and acting as a bridge between formal education and the labour market, SETAs do not directly offer qualifications but rather assist with skills development interventions, as a step towards the attainment of a qualification. Examples of the skills development interventions promoted by SETAs include learnerships, artisanal learning programmes, internships, and skills development programmes, as well as bursaries for tuition fees, which are granted on the basis of financial need. Youth in particular could stand to benefit from these programmes.

Ultimately, however, it is important that action be taken not only on the supply side but on the demand side as well. An increase in the education level of the population must be met with a concomitant increase in demand for the types of skills that are being attained. While those with qualifications still account for a relatively small share of the unemployed, if demand for these individuals' skills is not increased, the trend of increasing unemployment will continue, even for those with degrees. This will result in increased unemployment among higher-skilled individuals, over and above the rising unemployment among those who are lower-skilled. The next chapter considers the demand for skills in South Africa and how it changed between 2009 and 2019.

PART 5

The demand for skills

Understanding the economy's skills requirements is critical to skills planning. A clear sense of the required mix of skills is needed to formulate appropriate policy that will improve alignment between skills demand and supply. The purpose of this chapter is to identify signals of changes in the demand for skills in South Africa. It does so by considering trends in employment alongside feedback on changing skills requirements from employers, based on surveys conducted recently. Together, these data allow a picture of the demand for occupations and skills to be built up, providing signals to the education and training system regarding the areas of supply to be prioritised.

The chapter first uses labour force survey data to consider trends in the demand for skills in South Africa over the past decade.[6] Employment trends over time are an important lens through which to analyse the demand for skills. Patterns of employment across skills categories reveal employers' preferences for workers with different skill levels. The chapter provides an analysis of the changes in the sectoral and occupational distribution of the economy in order to ascertain signals of change in the demand for skills. The chapter also presents a profile of the qualifications and educational attainment of the employed over time.

With respect to future skills demand, this chapter considers recent employer surveys in order to provide an indication of expected changes in the demand for skills in the future. These surveys are not representative of the views of all employers in the South African economy. However, they do allow for the identification of the key changes that are expected to occur in the future, which should form part of the considerations and actions that should be taken today in terms of skills planning.[7]

6 It is noted here that employment data provide an imperfect measure of demand, as the total skills demand includes not only the skills of those who are employed but also skills that the employed do not have that may be desired by their employers, as well as the skills demand that is currently not being met at all by supply and that manifests in vacancies. Comprehensive data on these last two categories (desirable skills and unmet skills) do not currently exist. However, the available data allow for the identification of signals of change in the demand for skills.

7 Future iterations of this report will incorporate research findings that provide more detailed analyses of future skills requirements. Furthermore, Sectoral Education and Training Authorities collect data related to the skills needs of different sectors. A number of outputs produced as part of the Labour Market Intelligence Programme will analyse this data, and future iterations of the report will take into account the findings of these outputs and build on the overall analysis presented in this report on a sectoral level.

5.1. Changes in the sectoral distribution of employment

Table 5.1 below shows the composition of employment by industry in Q2 2009 and Q2 2019. Overall, employment has increased over the past decade in absolute numbers, from 14.4 million to 16.3 million workers, representing an increase of close to 2.0 million workers. The tertiary sector accounted for the largest share of this change by a wide margin, with 95 percent of the increase in employment attributable to this sector.

TABLE 5.1: Employment trends by industry, Q2 2009–Q2 2019

	NUMBER OF EMPLOYED		SHARE OF EMPLOYED		CHANGE IN EMPLOYED			
	Q2 2009 ('000s)	Q2 2019 ('000s)	Q2 2009 (%)	Q2 2019 (%)	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)	
Overall employment	***14 357***	***16 313***	***100.0***	***100.0***	***1 956***	***100.0***	***1.3***	*
Agriculture, forestry, and fishing	752	842	5.2	5.2	90	4.6	1.1	†
Mining and quarrying	350	381	2.4	2.3	32	1.6	0.9	
PRIMARY SECTOR	**1 102**	**1 223**	**7.7**	**7.5**	**121**	**6.2**	**1.1**	†
Manufacturing	2 032	1 789	14.2	11.0	-242	-12.4	-1.3	*
Electricity, gas, and water	104	151	0.7	0.9	48	2.4	3.9	*
Construction	1 207	1 363	8.4	8.4	156	8.0	1.2	*
SECONDARY SECTOR	**3 342**	**3 303**	**23.3**	**20.3**	**-39**	**-2.0**	**-0.1**	
Wholesale and retail trade	3 156	3 429	22.0	21.0	273	14.0	0.8	*
Transport, storage, and communication	780	983	5.4	6.0	203	10.4	2.3	*
Financial and business services	1 854	2 495	12.9	15.3	642	32.8	3.0	*
Community, social, and personal (CSP) services	2 836	3 622	19.8	22.2	787	40.2	2.5	*
Private households	1 286	1 251	9.0	7.7	-35	-1.8	-0.3	
TERTIARY SECTOR	**9 910**	**11 780**	**69.0**	**72.2**	**1 870**	**95.6**	**1.7**	*

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. An asterisk denotes statistically significant changes at the 95 percent confidence level, while a dagger (†) denotes statistically significant changes at the 90 percent confidence level.

PART 5

The primary sector saw a small increase in employment between Q2 2009 and Q2 2019, which accounted for 6.2 percent of the overall change. Employment in agriculture, forestry, and fishery increased from 752 000 to 842 000 workers over the period, an average increase of 1.1 percent per annum. The share of this industry within total employment was unchanged at 5.2 percent. Mining and quarrying employment increased from 350 000 to 381 000 workers, growing at an annual average rate of 0.9 percent. The total increase in the number of people employed in the primary sector over the decade was 121 000, resulting in the primary sector accounting for just over 1 million of all jobs in South Africa in Q2 2019 (representing around 7.5 percent of total employment, slightly lower than its share of 7.7 percent in Q2 2009).

Employment in the secondary sector was virtually unchanged over the period, with the significant decline in manufacturing marginally balanced by growth in the construction and electricity, gas, and water industries. Employment in the manufacturing industry declined by 243 000 workers over the period, equivalent to an average annual rate of decline of 1.3 percent. Employment in the electricity, gas, and water industry, however, increased at an annual average rate of 3.9 percent, from 104 000 to 151 000 workers, while construction employment increased from 1.21 million to 1.36 million workers, an average increase of 1.2 percent per year.

The growth in tertiary sector employment was driven by financial and business services (which grew by 642 000 workers, an increase of 3.0 percent per year over the period) and community, social, and personal (CSP) services (which grew by 787 000 workers, or 2.5 percent per year). There was also an increase in employment in the transport, storage, and communication industry, from 780 000 workers to 983 000 workers (an increase of 2.3 percent per year). Employment in wholesale and retail trade also increased (from 3.16 million to 3.43 million workers), but at a lower rate than employment in the other tertiary industries (0.8 percent per year). Private household employment did not change significantly over the period.

The tertiary sector dominates employment in absolute numbers – employing 11.8 million workers in Q2 2019, compared to 3.3 million for the secondary sector and 1.2 million for the primary sector – and this dominance is growing with time. This growth confirms the services-biased trajectory of the economy. The next section considers what this sectoral shift has meant for the occupational distribution of employment over the decade.

Revitalising industry: Plans and implications for skills demand and supply

South Africa is a services-orientated economy, with the services sector contributing around 66 percent of GDP (Bhorat et al., 2016). The services sector has also accounted for almost all of the employment growth in South Africa since 2000 (Bhorat et al., 2016). Much of the employment growth in this sector has been derived from the high-productivity financial services industry, which attracts highly skilled individuals. However, the skill intensity of the sector acts as an impediment to large-scale employment growth, given South Africa's large endowment of unskilled labour.

Arguably, the manufacturing industry remains key to addressing South Africa's unemployment challenge. Specifically, it is necessary to identify and develop targeted industries within the manufacturing industry. Accordingly, South Africa's current industrial policy, and the industries targeted by the current policy thinking, is outlined here.

The implementation and development of a formal industrial policy is guided by the National Industrial Policy Framework (NIPF) (Zalk, 2014). The annually released Industrial Policy Action Plan (IPAP) is the implementation blueprint of the NIPF; it highlights specific focus areas and sectors for promotion and development. A dominant theme in the IPAP relates to one of the economy's greatest challenges: a persistently high unemployment rate. In light of the unemployment challenge, several of the key IPAP themes are directly focused on using industrial policy as a possible solution. In particular, the IPAP highlights the growth of labour-intensive industries, particularly across the value chains that link the country's primary and secondary sectors. This goal of labour-intensive industrialisation is also a guiding principle for the identification of specific industries that the IPAP promotes: namely, agro-processing; component manufacturing; and clothing, textiles, leather, and footwear (CTLF).

The IPAP also identifies manufacturing as an industry that can provide secure wage employment to individuals of various skill types. In South Africa's case, this is very important, as the IPAP presents an opportunity for the absorption of low- and semi-skilled individuals in South Africa, who make up the majority of the unemployed in South Africa.

In light of the themes identified in the IPAP, the Department of Trade and Industry (DTI) targeted 12 industries for growth. These are outlined in the adjacent table, along with the relevant employment numbers. It is worth noting that, as it stands, the IPAP does not describe a manufacturing strategy. Rather, the focus is on downstream activities in certain industries, which can be captured as a form of manufacturing.

TABLE B.1: IPAP target industries

INDUSTRY	EMPLOYMENT[8]
Automotives	82 000
Clothing, textiles, leather, and footwear	140 552
Metal fabrication, capital, and rail transport equipment	311 404
Agro-processing	288 567
Forestry, timber, paper, pulp, and furniture	Unspecified
Plastics, pharmaceuticals, chemicals, and cosmetics	60 000
Primary minerals beneficiation	Unspecified
Green industries	Unspecified
Business process services	20 408
Marine manufacturing and associated services	3 900
Aerospace and defence	15 000
Electro-technical and white goods industries	318 000
Total	**1 239 831**

Source: DTI (2018)

Out of the 12 industries, 11 are located within the manufacturing sector, with the exception of business process services. This aligns with the emphasis on labour-intensive growth in the IPAP. Around 1.24 million people are employed in IPAP industries.[9] Employment in the measured IPAP industries constitutes approximately 8.0 percent[10] of total employment, which reinforces the importance of targeting these industries to generate sustainable employment growth.

Ultimately, while there has been a decline in the secondary sector, relevant plans such as IPAP, combined with necessary interventions on the supply side to provide the skills required by the sector, have the potential to revitalise the industrial sector and provide jobs that are required in the country.

8 Employment numbers are derived from the Industrial Policy Action Plan 2018/2019–2020/2021.
9 This may be an underestimation, as reliable employment numbers could not be obtained for three industries, given the small sizes of these industries.
10 Calculated using the total employment figure for Q2 2016 (15 545 000).

5.2. Changes in the occupational distribution of employment

Table 5.2 presents changes in the shares of high-skilled, medium-skilled, and low-skilled employment within the employed population between Q2 2009 and Q2 2019.

TABLE 5.2: Changes in skills shares in the employed population by occupational skill level, Q2 2009–Q2 2019

	PROPORTIONS (%)			CHANGE OVER Q2 2009–Q2 2019 IN:	
	Q2 2009	Q2 2014	Q2 2019	PERCENTAGE POINTS	NUMBERS ('000s)
PRIMARY					
High-skilled	7.2	6.7	5.0	-2.3	-18.9
Medium-skilled	39.7	38.5	34.9	-4.8	-10.1
Low-skilled	53.1	54.9	60.1	7.0	150.4
Total	**100.0**	**100.0**	**100.0**	**0.0**	**121.4**
SECONDARY					
High-skilled	17.3	19.1	18.1	0.8	19.7
Medium-skilled	64.2	61.5	63.1	-1.1	-62.5
Low-skilled	18.5	19.3	18.8	0.3	3.8
Total	**100.0**	**100.0**	**100.0**	**0.0**	**-39.0**
TERTIARY					
High-skilled	28.5	28.7	26.7	-1.8	319.6
Medium-skilled	42.2	42.8	44.8	2.6	1093.4
Low-skilled	29.3	28.4	28.5	-0.8	455.7
Total	**100.0**	**100.0**	**100.0**	**0.0**	**1 869.9**

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. 'High-skilled employment' refers to managers, professionals, and technicians. 'Medium-skilled' employment refers to the occupational categories of clerks, service and sales workers, skilled agricultural workers, and operators or assemblers. 'Low-skilled employment' refers to elementary and domestic workers.
2. The numbers of employed people for each occupation for Q2 2009 and Q2 2019 can be found in Tables A.1 and A.2 in the Appendix.

The primary sector remains dominated by low-skilled employment and saw an increase of such employment over the period in the form of 150 000 more jobs. The share of employment for low-skilled occupations increased from 53.1 percent in Q2 2009 to 60.1 percent in Q2 2019. There has been a decline in medium- and high-skilled employment in the sector in both absolute and relative terms.

The secondary sector remains dominated by medium-skilled employment (63.1 percent). The number of medium-skilled jobs declined by 62 500, and the corresponding share of employment declined from 64.2 percent in Q2 2009. The share of low-skilled employment was virtually unchanged (increasing slightly from 18.5 percent in Q2 2009 to 18.8 percent in Q2 2019). This share was, however, higher in Q2 2014, at 19.3 percent. High-skilled employment increased by 19 700 jobs, with the share of employment increasing from 17.3 in Q2 2009 to 19.1 percent in Q2 2014 and then declining to 18.1 percent in Q2 2019.

There has been an increase in jobs in all three skills categories in the tertiary sector, with high-skilled employment having increased by 319 600 jobs, medium-skilled employment by 1 093 400, and low-skilled employment by 455 700. The sector is dominated by medium-skilled employment: this type of employment accounts for more than two-fifths of employment in the sector in Q2 2019 (44.8 percent), an increase in share from 42.2 percent in Q2 2009. The share of low-skilled employment declined slightly, from 29.3 percent to 28.5 percent. The share of high-skilled employment also declined slightly, from 28.5 percent to 26.7 percent, between Q2 2009 and Q2 2019.

In terms of absolute numbers, the increase in medium-skilled employment was highest between Q2 2009 and Q2 2019 (1 020 800 jobs), followed by low-skilled employment (609 900 jobs). This increase was higher than the 320 400 jobs created within high-skilled occupations between Q2 2009 and Q2 2019.

The increase in medium-skilled employment is driven by the tertiary sector, with the number of medium-skilled jobs having declined in the primary and secondary sectors. High-skilled employment increased in both the secondary and tertiary sectors, with almost all of the increase driven by the tertiary sector. However, medium-skilled employment in the tertiary sector has grown faster than both high-skilled and low-skilled employment in this sector, resulting in the share of high-skilled employment declining slightly in the sector. Low-skilled employment has only seen a considerable increase in its share of employment in the primary sector – a sector that accounts for just 7.5 percent of all employment.

It is thus clear that, in relative terms, there has been a shift towards medium-skilled employment in the economy, with medium-skilled employment accounting for over half (52.3 percent) of the total change in employment between Q2 2009 and Q2 2019. High-skilled employment accounted for 16.4 percent of this change, which was around half of the share accounted for by low-skilled employment (31.3 percent). This shift is driven by the dominance of the tertiary sector. Table 5.3, an expansion of Table 5.2, indicates the share of the change in employment over the decade accounted for by both industry and one-digit occupational categories. It allows for a more nuanced analysis of the skills shifts in the economy. The table shows the share of the change in overall employment for different occupations, represented by the changes in those occupations in specific industries. High-skill tertiary employment is represented by the lower-left section of the table, while low-skill primary employment is represented by the top-right section. Changes highlighted in red indicate decreases in employment, while changes highlighted in blue indicate increases in employment.

TABLE 5.3: Share of total change in employment by industry and occupation, Q2 2009–Q2 2019

		SHARE OF CHANGE Q2 2009–Q2 2019 (%)										
		HIGH SKILL			MEDIUM SKILL					LOW SKILL		TOTAL
	INDUSTRY	MANAGERS	PROFESSIONALS	TECHNICIANS	CLERKS	SERVICE AND SALES	SKILLED AGRICULTURE	CRAFT AND RELATED	OPERATORS AND ASSEMBLERS	ELEMENTARY	DOMESTIC	
	Agriculture, fishing, and forestry	-1	-1	1	1	0	61	-99	11	21	8	5
	Mining	0	-10	-1	-1	0	4	-75	52	3	1	2
	Manufacturing	16	-16	16	-9	1	11	-410	-111	-6	1	-12
	Electricity, gas, and water (utilities)	3	0	-3	3	0	5	32	23	0	2	2
	Construction	8	-17	10	0	0	5	561	-9	7	1	8
	Wholesale and retail trade	8	-9	26	21	23	8	56	-26	18	10	14
	Transport, storage, and communication	16	-1	5	27	0	2	14	133	-4	0	10
	Financial and business services	22	14	-14	13	34	-2	229	7	24	6	33
	CSP services	28	140	59	45	44	4	-176	20	37	3	40
	Private households	0	0	0	0	-1	2	-31	-3	1	67	-2
Total change ('000s)		**422.1**	**129.7**	**-230.3**	**170.9**	**769.0**	**-33.0**	**24.1**	**93.9**	**644.4**	**-36.2**	**1 955.7**

Source: Own calculations, QLFS Q2 (Stats SA, 2009, 2019b)

Notes:

1. The final row of the table represents the total change in the number of employed (in thousands) over the period for each occupation. All other numbers in the table are shares of the total change in employment for each occupation over the period.
2. Changes highlighted in red indicate decreases in employment, while changes highlighted in green indicate increases in employment. Decreases are represented by a negative share of the change in employment when the total change is positive and a positive share of the change of employment when the total change is negative.
3. The numbers of employed for each occupation and industry for Q2 2009 and Q2 2019 can be found in Tables A.1 and A.2 in the Appendix.

Table 5.3 shows that, across all occupations, employment increased the most for service and sales workers (an increase of 769 000 jobs), elementary workers (644 400 jobs), and managers (422 100 jobs). The shift towards the services industries and medium-skilled employment has thus been driven predominantly by an increase in service and sales workers.

Employment has declined the most for technicians (a loss of 230 300 jobs). There were also declines for skilled agricultural workers and domestic workers (33 000 and 36 200 respectively). The subdued change in high-skilled employment observed within the economy overall therefore does not reflect the fact that there have been substantial increases in employment for managers and skilled professionals; rather, it reflects the decline in employment for technicians.

Within the primary sector, both mining and agriculture experienced a decline in the employment of managers and professionals. It seems that this sector has employed more skilled agricultural workers, operators and assemblers, and those in elementary occupations. This is particularly true of agriculture.

The secondary sector recorded an increase in the employment of managers but decreased employment of technicians and skilled professionals. There was a mix of increased and decreased employment for medium-skilled occupations, while there was considerable growth for craft workers in the construction industry. By contrast, employment of craft workers in the manufacturing industry declined. Operators in manufacturing also saw a large decline in employment over the period. Low-skilled workers in the secondary sector saw small declines overall, with the exception of elementary workers in construction, where employment increased somewhat.

In the tertiary sector, there was a mix of changes in employment for high-skilled occupations. There was an increase for managers in all industries, apart from private households. There was, however, a considerable decline for technicians. Medium-skilled occupations saw both large decreases in some tertiary industries – such as craft workers in community, social, and personal (CSP) services – and large increases in others, such as financial services. There was increased employment for low-skilled occupations in the tertiary sector. It is likely that the signalled demand for elementary occupations was also related to the growth in financial and other services; thus, it is auxiliary demand for elementary occupations that appears to be present, rather than demand from any particular industry that is itself low-skill intensive.

The analysis now highlights the sectors that recorded the highest increases (and the largest declines) in demand for each occupation, based on the changes in employment observed.

- For managers, there has been an increase in employment across all sectors except the primary sector (and with no increase for private households within the tertiary sector). The increase was greatest for CSP services (28 percent of the change for managers), financial and business services (22 percent), transport, storage, and communication (16 percent), and manufacturing (16 percent).
- For skilled professionals, there was an increase in employment only in CSP services and financial and business services, with CSP services accounting for most of the increased demand. The largest decline was recorded for construction, manufacturing, and mining.

- For technicians, there was a considerable decrease in employment in CSP services (accounting for 59 percent of the total decline), trade (26 percent), manufacturing (16 percent), construction (10 percent), and transport, storage, and communication (5 percent). The largest increase was in financial services.
- For clerks, there was an increase in employment across all tertiary industries (apart from private households). The largest increase in demand was recorded for the CSP services industry (accounting for 45 percent of the change in clerks' employment).
- For service and sales workers, there was an increase in employment in CSP services (44 percent of the change in employment), financial and business services (34 percent), and trade (23 percent).
- For skilled agricultural workers, employment decreased in all industries except financial and business services. The decrease was highest for agriculture (representing 61 percent of the change), manufacturing (11 percent), and trade (8 percent).
- For craft workers, employment increased in construction, financial and business services, trade, utilities, and transport, storage, and communication, with the increase in employment substantially higher for the first two than for the last three industries. There was a decline in employment in all other industries.
- For operators and assemblers, there was an increase in employment in transport, storage, and communication (accounting for 133 percent of the total change), mining (52 percent), utilities (23 percent), and CSP services (20 percent). The largest decline was recorded in manufacturing, although there were also declines in trade and construction.
- For domestic workers, employment decreased (although only slightly) in all industries except transport, storage, and communication. Private households accounted for two-thirds (67 percent) of the decline in total employment for these workers.
- For elementary workers, employment increased in all industries apart from manufacturing and transport, storage, and communication. CSP services, financial and business services, agriculture, and trade account for the largest shares of the overall increase in employment.

Overall, there has been a considerable increase in employment for the following occupations: service and sales workers (an increase in employment of 769 000 jobs, with close to all of this increase accounted for by increased demand in the tertiary sector), elementary workers (an increase in employment of 644 400 jobs, with this increase coming from different sectors), managers (an increase in employment of 422 100 jobs, driven mainly by the tertiary sector), clerks (an increase in employment of 170 900 jobs, driven by increased employment in the tertiary sector), and skilled professionals (an increase in employment of 129 700 jobs, driven by increased employment in the tertiary sector, particularly CSP services).

5.3. The education levels of the employed

This section analyses how the education profile of employed individuals has changed over the past decade across different sectors. This analysis serves as a signal of the level (and type) of education demanded by employers across different sectors in the economy and how this is changing over time.

5.3.1. Highest level of educational attainment by sector

Table 5.4 shows the education levels of the employed by each industry in Q2 2009 and Q2 2019. On average, across the primary, secondary, and tertiary sectors, there has been an increase in:

- The number of employed with incomplete secondary schooling, from 4.7 million to 5.4 million people, representing an annual average growth rate of 1.2 percent;
- The number of employed with completed secondary schooling, from 4.1 million to 5.3 million people, representing an annual average growth rate of 2.6 percent;
- The number of employed with diplomas or certificates, from 1.7 million to 2 million people, representing an annual average growth rate of 1.9 percent; and
- The number of employed with degrees, from 0.99 million to 1.5 million, representing an annual average growth rate of 4.1 percent, the highest of any educational cohort.

The number of employed individuals with primary or lower education, by contrast, declined from 2.6 million to 1.9 million people over the decade. There has only been an increase in employment for such individuals in one industry: financial and business services. It is likely that this pertains to auxiliary work demanded by the industry (i.e., security and cleaning services) that does not require skilled labour. In all other industries, there has been a decline in how many of these individuals are employed, likely due to the general increased education levels of the working-age population.

For those with incomplete secondary education, employment has increased in both agriculture, forestry, and fishing and mining and quarrying in the primary sector (at an average rate of 4.4 percent per year), in construction in the secondary sector (at a rate of 1.2 percent per year), and across all industries within the tertiary sector. The highest increases in the tertiary sector have been for financial and business services (4.4 percent per year) and CSP services (2.5 percent). These increases reflect increases in the demand for low-skilled labour across these industries.

For those with a completed secondary education (that is, in possession of a National Senior Certificate or equivalent), there has been an increase in employment in all industries except agriculture, forestry, and fishery. The greatest increase for this group was recorded in the tertiary sector (2.9 percent per year). Within the tertiary sector, the highest rate of increase in employment was recorded for transport, storage, and communication (4.3 percent per year), followed by private households (4.2 percent) and CSP services (3.6 percent). This may reflect increased demand for low- to medium-skilled labour in these industries. Substantial rates of increase were recorded for utilities (4.8 percent per year, although it accounted for a very small proportion of employment), private households (4.2 percent per year), and construction (3.7 percent per year). For private households and construction, this may be indicative of matriculants fulfilling demand for low-skilled work.

PART 5

TABLE 5.4: Employment by industry and highest level of educational attainment, Q2 2009–Q2 2019

EDUCATION	PRIMARY OR LOWER			INCOMPLETE SECONDARY			COMPLETED SECONDARY			DIPLOMA OR CERTIFICATE			DEGREE			TOTAL		
	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)	Q2 2009 ('000s)	Q2 2019 ('000s)	AAGR (%)
PRIMARY SECTOR	**458**	**344**	**-2.8**	**360**	**552**	**4.4**	**199**	**226**	**1.3**	**43**	**70**	**5.1**	**27**	**21**	**-2.3**	**1 102**	**1 223**	**1.1**
Agriculture, forestry, and fishing	384	298	-2.5	237	418	5.8	94	91	-0.3	17	17	0.0	14	10	-3.6	752	842	1.1
Mining and quarrying	74	46	-4.6	123	134	0.9	105	135	2.5	26	54	7.5	13	12	-1.2	350	381	0.9
SECONDARY SECTOR	**656**	**395**	**-5.0**	**1 359**	**1 186**	**-1.4**	**948**	**1 130**	**1.8**	**250**	**375**	**4.2**	**90**	**155**	**5.6**	**3 342**	**3 303**	**-0.1**
Manufacturing	302	153	-6.6	817	583	-3.3	661	711	0.7	158	224	3.5	72	88	2.0	2 032	1 789	-1.3
Electricity, gas, and water	13	4	-11.7	26	20	-2.3	34	54	4.8	22	47	7.6	6	25	14.8	104	151	3.9
Construction	342	238	-3.5	516	582	1.2	253	365	3.7	69	105	4.3	12	42	13.5	1 207	1 363	1.2
TERTIARY SECTOR	**1 512**	**1 141**	**-2.8**	**3 053**	**3 620**	**1.7**	**3 001**	**3 991**	**2.9**	**1 386**	**1 574**	**1.3**	**877**	**1 313**	**4.1**	**9 910**	**11 780**	**1.7**
Wholesale and retail trade	487	363	-2.9	1 198	1 256	0.5	1 144	1 418	2.2	235	251	0.7	64	94	4.0	3 156	3 429	0.8
Transport, storage, and communication	99	66	-3.9	299	338	1.2	257	392	4.3	79	117	4.0	38	61	4.9	780	983	2.3
Financial and business services	94	110	1.5	438	671	4.4	712	910	2.5	323	370	1.4	272	418	4.4	1 854	2 495	3.0
CSP services	253	227	-1.1	562	719	2.5	763	1 082	3.6	737	829	1.2	502	739	3.9	2 836	3 622	2.5
Private households	580	374	-4.3	556	637	1.4	125	188	4.2	12	6	-7.3	1	1	-5.6	1 286	1 251	-0.3
Other/unspecified	1	0	-	0	3	-	0	0	-	0	0	-	0	3	-	2	6	9.5
TOTAL	**2 628**	**1 880**	**-3.3**	**4 773**	**5 361**	**1.2**	**4 148**	**5 347**	**2.6**	**1 678**	**2 019**	**1.9**	**994**	**1 492**	**4.1**	**14 357**	**16 313**	**1.3**

Source: QLFS Q2 (Stats SA, 2009, 2019b)

For individuals with a diploma or certificate, there has been an increase in the number of individuals employed in all industries apart from private households. On average, however, the rate of increase has been higher in the primary and secondary sectors (5.1 percent and 4.2 percent per year, respectively) than in the tertiary sector (1.3 percent per year). Within the tertiary sector, employment of individuals with a diploma or certificate has grown the fastest in the transport, storage, and communication industry (4 percent per year).

Employment of individuals with a degree qualification increased across all industries except agriculture, forestry, and fishing, mining and quarrying, and private households. The rate of increase ranged between 2 percent per year in private households to 14.8 percent for the utilities industry. This signals strong demand for individuals with a degree. In CSP services, the number of individuals with degrees employed increased from 502 000 in Q2 2009 to 739 000 in Q2 2019 (an increase of 3.9 percent per year), while in the financial and business services industry the number employed increased from 272 000 to 418 000 over the period (an increase of 4.4 percent per year). These two industries account for over three-quarters (76.9 percent, or 383 000) of the total increase (498 000) in the number of individuals with degrees employed between Q2 2009 and Q2 2019.

Table 5.5 shows the shares of employment in each sector by highest level of educational attainment. It confirms that there has been a shift towards higher levels of education among the employed. Between Q2 2009 and Q2 2019, the share of individuals with degrees in the employed population increased from 6.9 percent to 9.1 percent. The share of individuals with diplomas or certificates in the employed population increased slightly from 11.7 percent to 12.4 percent. The share of individuals with completed secondary education also increased, from 28.9 percent to 32.8 percent. The share of individuals employed with incomplete secondary education declined, from over half of the employed in Q2 2009 (51.5 percent) to 44.4 percent in Q2 2019.

TABLE 5.5: Shares of employment by highest level of educational attainment, Q2 2009 and Q2 2019

EDUCATION	INCOMPLETE SCHOOLING		COMPLETED SECONDARY		DIPLOMA OR CERTIFICATE		DEGREE	
	Q2 2009 (%)	Q2 2019 (%)	Q2 2009 (%)	Q2 2019 (%)	Q2 2009 (%)	Q2 2019 (%)	Q2 2009 (%)	Q2 2019 (%)
PRIMARY SECTOR	**74.2**	**73.3**	**18.1**	**18.5**	**3.9**	**5.8**	**2.5**	**1.7**
Agriculture, forestry, and fishing	82.5	85.0	12.5	10.8	2.2	2.0	1.8	1.1
Mining and quarrying	56.3	47.4	30.1	35.4	7.5	14.1	3.8	3.1
SECONDARY SECTOR	**60.3**	**47.8**	**28.4**	**34.2**	**7.5**	**11.4**	**2.7**	**4.7**
Manufacturing	55.1	41.1	32.5	39.8	7.8	12.5	3.6	4.9
Electricity, gas, and water	37.3	15.9	32.6	35.7	21.6	30.8	6.1	16.7
Construction	71.1	60.2	21.0	26.8	5.7	7.7	1.0	3.1
TERTIARY SECTOR	**46.1**	**40.4**	**30.3**	**33.9**	**14.0**	**13.4**	**8.8**	**11.1**
Wholesale and retail trade	53.4	47.2	36.2	41.4	7.4	7.3	2.0	2.7
Transport, storage, and communication	51.0	41.1	32.9	39.9	10.1	11.9	4.9	6.2
Financial and business services	28.7	31.3	38.4	36.5	17.4	14.8	14.7	16.8
CSP services	28.8	26.1	26.9	29.9	26.0	22.9	17.7	20.4
Private households	88.3	80.8	9.7	15.0	0.9	0.4	0.1	0.1
Other/unspecified	72.3	49.7	14.1	0.0	13.7	0.0	0.0	50.3
TOTAL	**51.5**	**44.4**	**28.9**	**32.8**	**11.7**	**12.4**	**6.9**	**9.1**

Source: QLFS Q2 (Stats SA, 2009, 2019b)

Notes:
1. Primary and lower and incomplete secondary education have been combined as 'Incomplete schooling' in this table.
2. Rows do not sum to 100 for Q2 2009 and Q2 2019 as individuals for whom the highest level of educational attainment has been categorised as 'Other/unspecified' or 'Do not know' have been excluded from the table.

The tertiary sector had the highest share of employed individuals with a degree in Q2 2019 (11.1 percent, up from 8.8 percent in Q2 2009). Within the tertiary sector, CSP services (20.4 percent) and financial and business services (16.8 percent) had the highest shares of these individuals. The share of employed individuals with a degree also increased in the secondary sector (from 2.7 percent in Q2 2009 to 4.7 percent in Q2 2019). Within the secondary sector, the share was highest in the electricity, gas, and water industry (16.7 percent in Q2 2019, up from 6.1 percent in Q2 2009). The share of individuals with a diploma or certificate increased in the primary and secondary sectors but declined slightly in the tertiary sector, from 14 percent to 13.4 percent.

The primary sector had the highest share of employed individuals with incomplete schooling (73.3 percent in Q2 2019, down slightly from 74.2 percent in Q2 2009). The share of these individuals also declined in both the secondary and tertiary sectors (from 60.3 percent to 47.4 percent in the secondary sector and from 46.1 percent to 40.4 percent in the tertiary sector).

Overall, it is clear that, across the secondary and tertiary sectors, there has been significant increased demand for individuals with degrees and a decline in the relative share of individuals employed with incomplete schooling. In the primary sector, however, the share of individuals employed with a degree has declined slightly, while employment of individuals with incomplete schooling still accounts for close to three-quarters of all employment in this sector.

5.3.2. HE and TVET qualifications by sector

To provide a further consideration of changes in demand, specifically for higher-skilled occupations, the analysis now considers the qualifications profile of employed individuals with higher education (HE) qualifications[11] in particular.

Qualifications are traditionally classified into three Classification of Educational Subject Matter (CESM) categories: namely, business, commerce, and management studies; science, engineering, and technology; and humanities. These three CESM categories have been further categorised into eight subcategories: namely, business, commerce, and management studies; science; engineering or engineering technology; healthcare or health sciences; visual and performing arts; education, training, and development; other humanities and social sciences; and all other.[12] Table 5.6 presents the change in share of HE qualifications by industry between Q2 2013 and Q2 2019.[13] The number of individuals employed for each sector and each field of study for Q2 2013 and Q2 2019 can be found in Table A.4 in the Appendix.

11 Higher education qualifications are postgraduate diplomas, bachelor's degrees, honours degrees, master's degrees, and doctoral degrees.

12 Table A.1 in the Appendix shows how the field of study data collected in the Quarterly Labour Force Surveys have been used to allocate qualifications to each of these eight fields of study.

13 The analysis considers the changes between the second quarters of the years 2013 and 2019 here, as 2013 is the first year for which field-of-study data is available for Q2 of the Quarterly Labour Force Surveys.

TABLE 5.6: Absolute change in share of HE qualifications of the employed by sector and field of study, Q2 2013–Q2 2019

SECTOR	FIELD OF STUDY (%)								
	BUSINESS	SCIENCE	ENGINEERING	HEALTH	ARTS	EDUCATION	OTHER HUMANITIES	ALL OTHER	TOTAL
PRIMARY	**0.3**	**-0.3**	**-3.5**	**-0.3**	**0.0**	**-0.5**	**-0.8**	**-12.6**	**-1.0**
Agriculture, forestry, and fishing	-0.2	2.6	-0.6	-0.3	0.0	0.1	-0.7	-12.6	-0.6
Mining and quarrying	0.5	-2.8	-2.8	0.0	0.0	-0.6	-0.2	0.0	-0.4
SECONDARY	**-0.9**	**-4.6**	**-3.8**	**-4.1**	**1.7**	**0.3**	**-2.3**	**5.0**	**-1.4**
Manufacturing	-0.9	-8.0	-7.6	-4.1	-0.2	-1.0	-4.4	1.9	-2.6
Electricity, gas, and water	-0.8	0.0	-1.1	0.0	0.0	0.4	1.7	1.5	-0.1
Construction	0.7	3.5	4.9	0.0	1.9	1.0	0.4	1.6	1.3
TERTIARY	**0.3**	**4.8**	**7.3**	**4.4**	**-1.7**	**0.0**	**3.7**	**6.2**	**2.3**
Wholesale and retail trade	-2.4	3.3	-0.8	0.7	-4.0	0.4	2.1	-1.6	-0.3
Transport, storage, and communication	-1.0	-1.7	1.1	0.0	0.0	-1.2	-2.4	4.9	-0.4
Financial and business services	4.1	-2.5	1.0	-4.6	3.9	-0.6	5.2	19.2	2.7
CSP services	-0.4	5.7	6.1	8.4	-1.7	1.5	-1.3	-16.9	0.2
Private households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Other	0.3	0.0	0.0	0.0	0.0	0.0	-0.5	1.4	0.1
TOTAL CHANGE ('000s)	**120.4**	**20.1**	**20.8**	**-2.3**	**6.7**	**88.5**	**-6.4**	**56.1**	**303.9**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. The total change row shows the total change (in thousands) in the number of employed individuals with HE qualifications in each field of study. All other numbers are the absolute percentage point changes in the share of individuals with a qualification in each field of study in each sector. For example, 0.1 in row 1, column 1, means that the change in the share of business graduates employed in the primary sector increased by 0.1 percentage point between Q2 2013 and Q2 2019.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.

Table 5.6 shows that, overall, the largest increase in employment between Q2 2013 and Q2 2019 was for those with business or commerce qualifications (an increase of 120 400), followed by education (an increase of 88 500). There were only declines (of 6 400 and 2 300, respectively) in the employment of individuals with other humanities and health qualifications.

For each field of study, the table shows the change in the share of graduates with those qualifications employed in the different industries between Q2 2013 and Q2 2019. Overall, there has been a 1 percentage point decline in the share of graduates employed in the primary sector, a 1.4 percentage point decline in the share of graduates employed in the secondary sector, and a corresponding 2.3 percentage point increase in the share of graduates employed in the tertiary sector. There was an increase in the share of degree holders employed in the tertiary sector relative to the primary and secondary sectors for all fields of study except arts and education. This increase indicates an overall rise in the relative demand for HE qualifications in the tertiary sector and an overall decline in the relative demand for HE qualifications in the primary and secondary sectors.

There were decreases in the proportion of employees in the primary and secondary sectors who hold qualifications and increases of same in the tertiary sector. In the primary sector, the only field of study that saw an increase in its share of employed individuals was business. In the secondary sector, the share of qualifications in the arts, education, and all other fields of study increased. There were declines in share for all other fields of study. In the tertiary sector, there was an increase in share of qualifications for all fields of study apart from arts. This confirms the increasingly skills-biased trajectory of the tertiary sector, which dominates the South African economy.

The drivers of the increased shares of qualifications in the tertiary sector differed across fields of study, however. For business, the increased share was driven by demand in the financial and business services industry (a 4.1 percentage point increase in share). For science, the key drivers of the increased share were CSP services (a 5.7 percentage point increase) and trade (a 3.3 percentage point increase in share). For engineering, the key industry absorbing graduates was CSP services (a 6.1 percentage point increase). For health, the key industry was also CSP services (a 8.4 percentage point increase). For arts, there was, as mentioned, an overall decline in share in the tertiary sector. However, there was an increase in share in financial and business services (a 3.9 percentage point increase). For education, the share of employment in tertiary industries was unchanged overall, although there was an increase in share in CSP services (1.5 percentage points). The increase in share for other humanities was driven by an increase in share in the financial and business services industry (a 5.2 percentage point increase).

CSP services recorded increases in the share of science, engineering, health, and education qualifications. The financial and business services industry saw large increases in the relative demand for business, engineering, arts, and other humanities qualifications. The trade industry recorded increasing relative demand for science, health, education, and other humanities qualifications.

While these trends are suggestive of shifts in the relative demand for specific qualifications in different sectors, the qualifications profile of the employed is not a particularly strong indicator of demand, since it is possible that individuals are employed in sectors and occupations in which their particular qualification makes them either under- or overqualified for the job that they do. The qualifications profile of the employed is considered in more detail in Chapter 7 in order to obtain a better sense of whether there seem to be mismatches between the field of study of qualifications and the occupations and sectors in which individuals are employed.

Table 5.7 presents the change in the share of individuals with technical and vocational education and training (TVET) qualifications by industry between Q2 2013 and Q2 2019. The numbers of individuals employed for each sector and each field of study for Q2 2013 and Q2 2019 can be found in Table A.5 in the Appendix.

TABLE 5.7: Absolute change in share of TVET qualifications of the employed by sector, Q2 2013–Q2 2019

SECTOR	FIELD OF STUDY (%)								
	BUSINESS	SCIENCE	ENGINEERING	HEALTH	ARTS	EDUCATION	OTHER HUMANITIES	ALL OTHER	TOTAL
PRIMARY	**0.2**	**2.3**	**-1.8**	**-0.1**	**0.0**	**0.1**	**2.4**	**2.3**	**0.0**
Agriculture, forestry, and fishing	0.1	-0.5	-0.6	-0.4	0.0	-0.3	1.8	0.6	-0.3
Mining and quarrying	0.0	2.8	-1.2	0.3	0.0	0.4	0.6	1.8	0.3
SECONDARY	**-1.2**	**-0.6**	**2.3**	**-1.7**	**4.7**	**1.2**	**-0.7**	**1.3**	**1.2**
Manufacturing	-1.3	0.3	-1.2	-1.9	4.7	0.4	0.5	0.0	-0.2
Electricity, gas, and water	-1.0	0.8	2.6	1.1	0.0	0.0	1.2	-1.1	0.5
Construction	1.1	-1.7	1.0	-1.0	0.0	0.8	-2.4	2.5	0.9
TERTIARY	**1.3**	**-1.7**	**-0.6**	**1.8**	**-4.7**	**-1.3**	**-1.6**	**-3.6**	**-1.1**
Wholesale and retail trade	-1.2	-8.4	1.3	-1.2	15.7	-0.8	-3.1	-3.5	-1.1
Transport, storage, and communication	1.4	2.2	-1.4	1.3	0.0	1.3	-8.3	1.4	0.4
Financial and business services	0.1	5.8	2.5	1.5	-5.5	-1.8	1.6	-1.9	0.9
CSP services	1.4	2.0	-2.9	-0.8	-14.8	-0.5	8.2	0.3	-1.2
Private households	-0.3	-3.3	-0.1	0.9	0.0	0.5	0.0	0.1	-0.1
Other	0.2	2.3	-1.8	-0.1	0.0	0.1	2.4	2.3	0.0
TOTAL CHANGE ('000s)	**45.7**	**-52.4**	**60.7**	**3.6**	**3.1**	**-0.7**	**-50.7**	**135.5**	**144.8**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. The total change row shows the total change (in thousands) in the number of employed individuals with TVET qualifications for each field of study. All other numbers are the absolute percentage point changes in the share of individuals with a qualification in each field of study in each sector. For example, 0.4 in row 1, column 1, means that the change in the share of individuals with business TVET qualifications increased by 0.4 percentage points between Q2 2013 and Q2 2019.
2. A number of individuals are qualified in smaller fields that do not form part of the other seven larger categories. They are included in the 'All other' category.

The number of individuals employed with TVET qualifications increased by 144 800 between Q2 2013 and Q2 2019. This increase was far lower than the increase of 303 900 recorded for those with HE qualifications over the same period. The largest increase was for those with all other qualifications (135 500), followed by those with engineering qualifications (60 700) and those with business or commerce qualifications (45 700). Concerningly, there was a decline of 52 400 for individuals employed with science qualifications and a decline of 50 700 for individuals with other humanities qualifications.

In terms of relative changes in demand across sectors, there has been a relative increase in demand for individuals with TVET qualifications in the secondary sector and a decline in relative demand for these individuals in the tertiary sector. This is in contrast to employed individuals with HE qualifications. For these individuals, there was an increase in relative demand in the tertiary sector and a decline in the primary and secondary sectors.

In the primary sector, there has been no overall change in the share of employed individuals with TVET qualifications. There has, however, been an increase in share in the secondary sector and a decline in share in the tertiary sector. In the secondary sector, there has been an increase in the relative demand for qualifications in all fields of study apart from business, science, health, and other humanities. In the tertiary secondary, there has been decreased relative demand for individuals with TVET qualifications in all fields except business and health. These shifts suggest that, despite a dominant and expanding tertiary sector, there is muted demand for TVET qualifications in this sector for all qualifications except those in the business and health fields. This trend is concerning, given that this is the sector that accounts for most growth and job creation in the South African economy.

5.4. Beyond historical shifts: Expectations of future skills demand

Up to this point, this chapter has considered what the shifts in the sectoral and occupational profiles of the employed in South Africa over the past 10 years suggest about the changing nature of skills demand in the country. The remainder of the chapter focuses on how skills demand can be expected to change further in the future. Reference is made to two recent studies in particular: the World Economic Forum's (WEF's) 2018 *Future of Jobs Report* and the National Economic Development and Labour Council's (NEDLAC's) 2019 *Futures of Work in South Africa* report, conducted by the Institute for Futures Research (IFR).

The WEF report (2018) presents the results of an online survey of business executives of global companies (principally chief human resources officers). Data collection took place between November 2017 and July 2018. Executives were asked a number of questions focused on the following: mapping transformations; documenting shifting work tasks and skills requirements in the job roles performed by individuals by 2022; and understanding the priorities of companies with regard to worker training. Ultimately, the survey aimed to capture current planning and projections related to skills in the period leading up to 2022. It should be noted that, as the survey focused on large multinational companies and significant localised companies only, the report does not present any findings related to small- and medium-sized enterprises nor to the informal sector. Responses from 313 companies across 20 countries were represented in the collected data. The WEF report presents the results for South Africa as a whole; it does not specify how many of the companies interviewed were operating in South Africa.

Twelve industries were considered in the WEF study: namely, aviation, travel, and tourism; chemistry, advanced materials, and biotechnology; consumer; energy; financial services and investors; global health and healthcare; information and communication technologies; infrastructure; mining and metals; mobility; oil and gas; and professional services.

Based on the survey data, the WEF report presents a table of emerging occupations for South Africa. These are occupations for which demand is expected to increase in the country over the period 2018–2022. The listed occupations were the occupations most frequently cited by survey respondents within companies that are operating in South Africa. The report also presents emerging skills (competencies) for South Africa. These were the competencies most frequently cited by the survey respondents. The categorisation of skills (competencies) is adapted from the Occupational Information Network (O*NET) labour market information system.[14] These occupations and competencies are shown in Table 5.8.

TABLE 5.8: Emerging occupations and skills (competencies) in South Africa, 2018–2022

EMERGING OCCUPATIONS	EMERGING SKILLS (COMPETENCIES)
Software and applications developers and analysts	Analytical thinking and innovation
Sales and marketing professionals	Creativity, originality, and initiative
Managing directors and chief executives	Active learning and learning strategies
General and operations managers	Technology design and programming
Data analysts and scientists	Complex problem-solving
Financial and investment advisers	Leadership and social influence
Assembly and factory workers	Reasoning, problem-solving, and ideation
Sales representatives, wholesale and manufacturing, technical and scientific products	Critical thinking and analysis
Industrial and production engineers	Resilience, stress tolerance, and flexibility
Human resources specialists	Emotional intelligence

Source: WEF (2018)

A recent survey of employers conducted by Sectoral Education and Training Authorities (SETAs) in South Africa also identified a number of emerging occupations and competencies. These occupations and competencies are shown in Table 5.9.

14 The O*NET framework was developed by the United States Department of Labor. It includes 974 individual occupations in the United States and is regularly updated.

TABLE 5.9: Emerging occupations and competencies in South Africa, 2020

EMERGING OCCUPATIONS	EMERGING SKILLS (COMPETENCIES)
Data analysts and scientists	Big data analytics, block chain development, AI, software design, coding, drone technology, cyber security
Robotic engineers	Social media
Software engineers and coders	Business modelling
Block chain, cybersecurity, AI specialists, forensic investigators, app developers	Strategy
Social media specialists	People and conflict management
User experience analysts	Diversity, coaching, and mentoring
Actuaries and cloud architects	Leadership
Drone pilots	Business development
Climate change scientists	Monitoring and evaluation
	Problem-solving
	Robotics
	Forensics

Source: Rasool (2020)

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The emerging occupations identified in these reports suggest that higher-skilled management occupations and higher-skilled occupations related to technological change are emerging. An exception to this rule seems to be the assembly and factory workers category identified in the WEF report. This is a relatively lower-skilled occupation, and it is important that jobs at this occupational level be created alongside the more higher-skilled management and technical jobs.

In terms of emerging skills (competencies), it is again those skills that are strongly related to management and the adoption of new technologies that are cited as growing in importance. Emotional intelligence and resilience are also noted as competencies that are emerging.

Importantly, the WEF report (2018, p. 15) notes that

> [t]he future of jobs is not singular. It will diverge by industry and sector, influenced by initial starting conditions around the distribution of tasks, different investments in technology adoption, and the skills availability and adaptability of the workforce. As a consequence, different industries experience variation in the composition of emerging roles and in the nature of roles that are set to have declining demand.

This point was further emphasised in the NEDLAC report (2019), which considers the key drivers of change in different sectors and industries in South Africa, as well as the roles that are expected to increase and decrease in these sectors and industries in the future as a result of the identified drivers of change. Automation, demographic changes, and globalisation are noted in the report as the three broad drivers of change across sectors that are likely to result in some occupations and activities disappearing, although these drivers will also create opportunities for new occupations and activities to emerge. However, the effect that each driver is expected to have on different sectors and industries varies considerably.

As part of the NEDLAC report, a number of interviews with industry stakeholders were carried out by the IFR for the purpose of obtaining insights about the future of work in different industries in South Africa. The summarised results presented in the table below reflect the insights obtained from the desktop research, workshop, and interviews that were conducted as part of this project.

TABLE 5.10: Drivers of change and expected changing roles in various sectors and industries in South Africa

SECTOR OR INDUSTRY	DRIVERS OF CHANGE	EMERGING OCCUPATIONS	OCCUPATIONS IN DECLINE
HEALTH	Ageing populations Promotion of well-being New business and care-delivery models aided by digital technologies Informed and empowered consumers Rising demand	Recreational wellness therapists Nurse practitioners Virtual reality (VR) experience designers Drone monitors (in new delivery models) Home health aides Online diagnosticians Care bots Medical tourism practitioners Co-bot surgeons App developers Geriatric carers Geneticists Wellness mentors	Medical and clinical lab technologists Medical transcriptionists Medical records and health information clerks Pharmacy aides Medical equipment preparers Dental lab technicians Dental hygienists Opticians (dispensing) Trainers (replaced by applications) Medical insurance claims clerks
INFORMAL ECONOMY	Rise of collectives and co-operatives Retailer offerings at lower end of market Growing interest in recycling Gig economy Rise of digital platforms, digital proficiency, and enhanced connectivity Changing mental models that destigmatise the notion of not having a full-time job	Gig-like service providers Personal security service providers Occupations related to informal banks (stokvels) Daycare specialists Crafters (related to the 'maker' movement) Elderly care specialists Networking specialists (connecting people) Home-care specialists (Social) media specialists Data analysts for informal sector App developers to connect informal traders and service providers	n/a

SECTOR OR INDUSTRY	DRIVERS OF CHANGE	EMERGING OCCUPATIONS	OCCUPATIONS IN DECLINE
OIL AND COAL	Legislation and regulation related to carbon emissions Technology innovation (e.g., electric and automated cars) Water, food, and climate change Globalised, urbanised, connected world	Solar technicians Designers of solar systems Energy optimisers Multi-source grid managers Solar engineers Wind energy technicians Process automation specialists Data analysts Forecourt destination managers Re-trainers (enabling existing oil and coal workers to acquire new skills) Designers of wind energy systems	Mining plant operators Oil and coal extraction workers Power plant operators Oil-refining plant operators Material recording and stock-keeping clerks Inspectors, testers, samplers, weighers Procurement clerks Crushing machine setters and operators Mapping technicians Drilling and boring machine setters and operators Excavating, loading, and dragline operators Conveyor operators Geological and petroleum technicians Planning and expediting clerks
TRANSPORT	Urbanisation New technologies and vehicles: self-driving cars, autonomous trucks, autonomous aviation, remote-controlled cargo ships Machine learning and optimisation	Data analysts AI and machine learning specialists System optimisers Infrastructure designers Supply chain and logistics specialists Transport hub experience managers Solution designers Blockchain management of transport routes, bookings, etc. VR training developers Transport concierges Drone operators	Taxi and bus drivers Cashiers and ticket clerks Route monitors Cargo vessel crew members Train drivers Cargo and freight clerks Parking lot attendants Truck drivers Railroad brake, signal, and switch operators
PUBLIC SECTOR	Fragmenting global order Expanding individual power The Fourth Industrial Revolution Demographics	Digital transformation specialists Digital currency people Embassies taking a bigger role as business developers and facilitators People facilitating optimisation across departments Process automation specialists 'Connectors' across departments (to identify opportunities for working together) Cybersecurity monitors and professionals AI ethics officers and coders Repurposers (people turning concrete jungles into greener spaces)	Accounting, bookkeeping, and payroll clerks Administrative staff (capturing and sharing information) Material recording and stock-keeping clerks Ballot and vote counters Roles that are duplicated across different departments Internal auditors Couriers and messengers Order clerks Roles that build unnecessary levels of hierarchy into the system (move toward flatter structures)

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SECTOR OR INDUSTRY	DRIVERS OF CHANGE	EMERGING OCCUPATIONS	OCCUPATIONS IN DECLINE
SERVICES	Globalisation (mobility) Demographic shifts Innovations in technology: AI Advanced user interfaces	Digital transformation specialists Human–machine integration coaches User experience designers Artists that create sensory-focused items Experience agents (travel agents that design and book customised experiences) AI and machine learning specialists Repurposing agents (for waste and redundant items) AI testers Augmented reality journey builders Gig designers Bot managers	Client information and customer service clerks Telemarketers Data entry clerks Freight clerks Accounting and payroll clerks Mass travel agents Legal clerks Credit analysts Procurement clerks Rental clerks Tour guides Inspectors Financial analysts Brokerage clerks Cashiers and tellers
EDUCATION	Globalisation Digitisation Improved user interfaces and algorithms Ageing, lifelong learning, reskilling	Designers of learning offers for mobile devices Curated knowledge specialists Learning progress analysts Transition coaches (preparing people for next jobs) Special needs education facilitators Ed experience customisers Blended learning designers AI coders for teaching and learning Cross-disciplinary integrator of knowledge	Registration clerks Accountants and bookkeepers Mediocre teachers Teachers that just share content Librarians Facilities teaching outdated skills and materials Proofreaders Printing press operators Statistics assistants Education that is not personalised or customised Office and admin clerks Attendance control clerks
AGRI-PROCESSING	Urbanisation Dietary transitions Diverse consumers Emerging technologies: big data, internet of things (IoT), AI, machine learning, blockchain New physical systems Advances in science Mobile applications Online marketplaces	Biotechnologists Robotics specialists and engineers Alternative packaging advisors Sensor specialists and technologists Creators of experiences (developers of the processing facility or the farm as a destination) Transport economists Data analysts Recipe developers Nutritionists Alternative packaging suppliers and designers	Sorters Cutters Packers Moving materials at processing facilities Quality checkers Suppliers of plastic packaging Payroll and accounting clerks Administrative clerks Control clerks Logistics clerks

SECTOR OR INDUSTRY	DRIVERS OF CHANGE	EMERGING OCCUPATIONS	OCCUPATIONS IN DECLINE
FINANCIAL	Rapid digital adoption Software platforms, digitisation, and the development of applications Better connectivity (access and speed) Changing customers preferences and expectations Emerging alternative models of lending and capital raising Technologies: big data analytics and AI Entry of non-traditional players in the market	Conversational interface designers Compliance experts Mixed reality experience designers Cloud banking workers Cybersecurity experts Platform creators Investor protection specialists Interconnectors (between business and customers, employers and employees, sellers and buyers) Financial services and fintech 'concierges' Hyper-personalisation inventors Interaction policy writers Financial ecosystem creators	Data entry clerks Insurance underwriting clerks Telemarketers Claims adjusters and examiners Tellers Credit analysts Statistics clerks Administrative service managers Tax examiners and revenue agents Accountants and auditors
MINING	Falling commodity prices Depletion (profitability) Technologies: drone applications, proximity sensors and improved communication systems, software applications Autonomous trucks and loaders Legacy systems could hamper adoption of new technologies Improved methods of collecting and using data Re-mining existing waste dumps	Specialists in the re-mining of waste dumps Workplace and worker experience reformers Underground drone operators Application developers Data analysts Collaborators Re-designers of underground operations Autonomous truck and loader supervisor	Payroll and timekeeping clerks Inspectors, testers, sorters, weighers, samplers Procurement clerks Crushing and grinding machine operators and setters Surveying and mapping technicians Rock splitters Excavating and loading machine and dragline operators Conveyor operators Freight and cargo agents Crane, hoist, and winch operators Truck and ship loaders Tool and die makers
MANUFACTURING	Competition from low-wage, high-productivity nations Changes in consumer preferences Slowing in individual consumption Currency volatility Growing middle class (Africa) Automation and digitisation Technologies: mobile applications, sensors, robotics, etc.	Digital manufacturing workers Worker experience creators Factory automation workers Value chain 'greeners' Digital fluency trainers Production lineworker coaches and re-skillers Creators and facilitators of customised offers Supervisors of autonomous things African markets analysts	Cargo and freight agents Inspectors, testers, sorters Machine setters and operators Procurement clerks Packaging and filling machine operators Machine feeders and offbearers Assembly lineworkers Payroll and timekeeping clerks Timing device adjusters Mould makers Mechanical drafters Patternmakers Painting and coating workers

SECTOR OR INDUSTRY	DRIVERS OF CHANGE	EMERGING OCCUPATIONS	OCCUPATIONS IN DECLINE
AUTOMOTIVE	Environmental pressure: emission legislation, costs related to resistance to fossil fuels Structural shifts in market demand (electric vehicles) Customer preferences	Non-fossil-fuel energy technologists Cyber security experts Digital fluency trainers Production lineworker re-skillers Value chain 'greeners' In-vehicle infotainment system developers System optimisers Robot engineers	Assembly lineworkers Welders, cutters, solderers, brazers Procurement clerks Inspectors, testers, samplers Crane, hoist, and winch operators Automobile testers Car sales people Mechanics and diagnosticians Machine setters and operators
AGRICULTURE	Consumer demands and preferences Mobile services Big data, analytics, blockchain (improvements in financial inclusion for farmers) Gene-editing technologies Advanced-precision agriculture technologies Challenges: climate change, land reform, crime, water availability, logistics, investment environment Opportunities: improved productivity, growing population, increased consumer spending, new markets, new technologies	Indoor farm managers IoT managers Agronomists Horticulturists Drone operators Vertical farming specialists Nutrigenetics advisors Agricultural economists Animal bioscientists Hydrologists Precision agriculture technologists	Pesticide handlers and applicators Payroll and timekeeping clerks Fence erectors Purchasing agents Cooling equipment operators Inspectors, samplers, weighers Drying and cooling equipment operators Fishers and related fishing workers General farm workers Product representatives

Source: IFR (2019)

Overall, the IFR study highlighted that different occupations are expected to decline and emerge across different sectors and industries. However, while the exact nature of the expected occupational change varies across sectors and industries, in almost all areas occupations related to technological developments that involve digital skills are expected to become more important. These developments include automation, intelligent algorithms, quantum computing, and smart, connected products and systems. Existing occupations may be augmented by these technologies, while new tasks and occupations are also expected to emerge altogether. Across sectors and industries, occupations that are expected to decline in importance are mainly those that involve routine tasks and those that may be made redundant by automation and other types of technology.

The WEF report (2018) also emphasises that, while there are some commonalities in the types of occupations that are expected to decline and emerge across sectors and industries, the emergence and decline of roles will not evolve in the same manner for all sectors and industries. It is not simply the types of emerging and declining occupations that are expected to differ across sectors and industries;

the pace of change is also expected to differ and will likely be influenced by "initial starting conditions around the distribution of tasks, different investments in technology adoption, and the skills availability and adaptability of the workforce" (WEF, 2018, p. 15). Importantly, this point emphasises that skills demand, while informing skills supply, is also informed by the supply of skills.

5.5. Conclusions and implications for skills planning

Chapter 3 of this report demonstrated that there has been a shift towards the tertiary sector in the South African economy, with the CSP services and financial and business services industries becoming particularly dominant. The present chapter has demonstrated that employment in the economy has followed this broader shift in the economy. The shift in employment towards the services sector has resulted in an increasing shift away from lower-skilled employment to medium- and high-skilled employment. Medium-skilled employment accounted for over half (52.3 percent) of the total change in employment between Q2 2009 and Q2 2019. High-skilled employment accounted for 16.4 percent of the total change for the period, which was around half of the share occupied by low-skilled employment (31.3 percent).

While the share of change accounted for by high-skilled employment seems relatively low, there has been a considerable decline in the number of technicians employed in the economy, which masks the strong increased demand for managers and professionals. For managers, there was an increase in employment in all sectors except the primary sector (and with no increase for private households within the tertiary sector). The increase has been greatest within CSP and financial and business services. For professionals, there was also a considerable increase in these two industries.

In terms of highest level of educational attainment, there has been an increase in the number of individuals employed with incomplete secondary schooling, completed secondary schooling, certificates or diplomas, and degrees. The rate of increase has, however, been highest for individuals with degrees. Overall, it is clear that, across the secondary and tertiary sectors, there has been significant increased demand for individuals with degrees and a decline in the relative share of employment for individuals with incomplete schooling. In the primary sector, conversely, the share of individuals employed with degrees has declined slightly, while employment of individuals with incomplete schooling still accounts for close to three-quarters of all employment in the sector.

These trends point to an important role for the PSET system, in terms of providing the skills that are in demand in the economy. In particular, HEIs must respond to the demand for managers and professionals, and TVET colleges must respond to the demand for medium-skilled employment in the economy. Those with low levels of education must be supported to attain the types of skills that are in demand in the services-driven economy. However, within the context of constrained economic growth, not all individuals in need of employment will be able to attain employment in higher-skilled occupations. Thus, the primary and secondary sectors – as well as different tertiary industries that have a higher propensity to absorb lower-skilled labour than the CSP and financial services industries – should also be supported, so that there is an appropriate mix of demand for varying levels of skills in the economy.

Within the tertiary sector, there was a clear increase in the absorption of individuals with HE qualifications across all fields of study (except arts). However, for individuals with TVET qualifications, this trend was not observed. The tertiary sector, while dominant and expanding, seems to offer muted demand for all TVET qualifications except those in the business and health fields. This finding is concerning given that this is the sector that accounts for most of the growth and job creation in the South African economy. It emphasises the need to grow industries beyond financial and CSP services that can provide employment to individuals who obtain HE or TVET qualifications.

Finally, the chapter considered the results of two employer surveys in order to obtain an idea of how skills demand may change in the future. The emerging occupations identified by the survey respondents suggest that higher-skilled management occupations and higher-skilled occupations related to technological change are emerging. In terms of emerging skills competencies, it is again those that are strongly related to management and the adoption of new technologies that are likely to become more important.

Across sectors and industries, the occupations that are expected to decline in importance are mainly those that involve routine tasks and that face the risk of being made redundant by automation. Importantly, however, changes in demand are expected to differ across sectors and industries. HEIs and TVET colleges must therefore be able to respond to a varied and evolving set of skills needs. One way to ensure this responsiveness is to forge greater collaboration between businesses (which are at the forefront of changes in their respective industries) and educational institutions. Employers should be actively involved in ensuring that training, skills, and career pathways are informed by current and future work and skills requirements. This would allow students to learn skills that are in demand.

In particular, in order for the South African economy to cope with substantial changes in the demand for certain skills as a result of the Fourth Industrial Revolution (4IR), the types of skills obtained by labour market entrants will need to change. This process will require a number of interventions from the supply side of the labour market, especially in relation to post-secondary education.

Looking towards the future: The Fourth Industrial Revolution

Rapid technological changes, broadly referred to as the Fourth Industrial Revolution (4IR), are expected to lead to changes in the skills demanded by employers. In line with these changes, certain occupations are expected to decline in their importance, while others are expected to become more important. Skills planners must be available to understand these shifts in demand if they are to successfully assist in building and maintaining a capable workforce that can respond to the needs of the economy.

While there is no single definition of the 4IR, in its broadest terms it refers to a dramatic acceleration in the pace and scope of the automation of tasks previously done by humans.

The 4IR is associated with technologies such as robotics; artificial intelligence (AI); the internet of things (IoT); augmented reality (AR); nanotechnology; autonomous vehicles; block chain; cloud computing; and 3D printing. Importantly, it is not just the development of these technologies – many of which predate the 4IR – but their widespread application across economies, in both scope and scale, that is of relevance. The 4IR is also related to what has been called the 'smart factory' (Dutton, 2014). In a smart factory, a virtual copy of the physical world can be developed and decision making can become decentralised (Buhr, 2015). Also, physical systems can co-operate and communicate with one another and with humans in real time, all enabled by the IoT and related technologies.

In terms of the impact that the 4IR will have on skills demand, much of the nascent literature has focused on the types of tasks that are typical to a particular occupation. Jobs that involve tasks that are routine and easily codifiable are likely to be automated in the future. Typical jobs in this category would include cashiers, telemarketers, and legal secretaries. On the other hand, occupations that are less vulnerable to automation are those that involve high levels of creativity, technical and social skills, and dexterity. Occupations using these types of skills include teachers, nurses, artists, and nuclear engineers. Skills required by these occupations are likely to experience increasing demand. Overall, low-skilled jobs are more vulnerable than high-skilled jobs, but this is not a straight correlation.

In order for the South African economy to cope with substantial changes in the demand for certain skills as a result of the 4IR, the types of skills obtained by labour market entrants will need to change.

This change will require a number of interventions from the supply side of the labour market, especially in relation to post-secondary education. A number of suggestions regarding how HEIs should respond to the 4IR are outlined below.

Firstly, science, technology, engineering, and mathematics (STEM) subject curricula need to be adapted in order to ensure that students develop competencies in areas such as data science, AI, and robotics (Penprase, 2018). Greater emphasis must be placed on developing computer science competencies – including within science majors that do not traditionally emphasise computer science skills, such as biology and chemistry. Stanford University has demonstrated that such adaptions to the curriculum can easily be made by, for example, allowing biology students to design their own life forms on computers and creating a new major known as bioengineering, which combines biology and engineering (Penprase, 2018).

Secondly, the 4IR has brought forward the notion of lifelong learning. The idea behind lifelong learning is that, because 4IR will lead to many jobs becoming automated, while also creating many jobs that do not exist yet, it is important to allow individuals the opportunity to upskill themselves during their working lives. Universities can facilitate lifelong learning by developing relevant online courses, which allow individuals of any age to learn about a particular area of interest. Although online courses do exist in South Africa, the current choices on offer are limited. There is plenty of scope to improve the variety of online courses offered.

TVET colleges also have a role to play with regard to the 4IR. Cohen (2019) makes the point that TVET colleges should adopt a demand-led approach, where businesses are actively involved in devising training, skills, and career pathways for TVET students. These career pathways would be informed by current work and skills requirements, allowing TVET students to learn in-demand 4IR skills. In short, TVET colleges must adapt to the 4IR by seeking out greater input from businesses, which will be at the forefront of technological change.

PART 6

The supply of skills

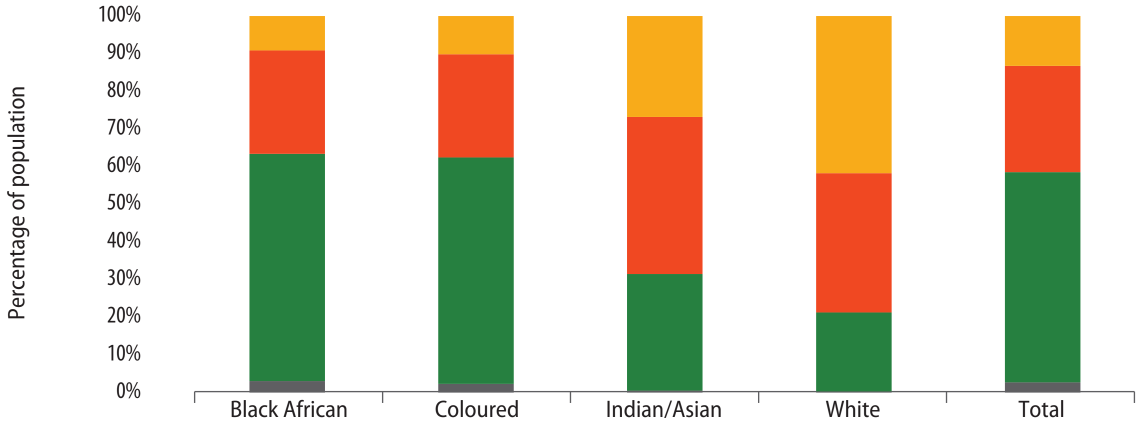
The future skills supply in a country can be ascertained through consideration of two key components: first, the skills of the current labour force, along with trends within the labour force, and, second, the education and training pipeline, which determines the skills that will be available in the labour force in the future. The two departments responsible for education – namely, the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET), formed when the former Department of Education was split in 2009 – play a key role in shaping the skills pipeline in South Africa. The DBE is responsible for the schooling system (Grade R to Grade 12), while the DHET was specifically established to focus on post-school education and training (PSET) (DHET, 2020). Reflecting this division of responsibility, this chapter on skills supply focuses on the basic education sector and the PSET sector separately, analysing key trends in these sectors for the period 2008–2017. The analysis presented in the chapter draws on two DHET reports on the PSET system: *Post-School Education and Training Monitor: Macro-Indicator Trends* (DHET, 2019a) and *Statistics on Post-School Education and Training in South Africa* (DHET, 2019b).

6.1. The skills profile of the working-age population

From a human capital perspective, education and training improve the productivity of individuals. In this sense, it is important to consider the education levels and training of the population when evaluating skills supply in a country. This section presents key trends within the skills profile of the working-age population, whereafter trends in the education and training pipeline (in the basic education sector and the PSET sector) are discussed.

Figure 6.1 depicts the highest level of educational attainment for the working-age population (15–64 years) in South Africa by population group in 2017. The figure shows that 27.8 percent of the working-age population had successfully completed secondary school (matric) by 2017, while 13 percent of the working-age population held some kind of post-secondary qualification. The figure highlights major inequalities between population groups in terms of educational attainment: 41.1 percent of the white working-age population held a post-secondary qualification, while this proportion was 8.9 percent, 10.1 percent, and 26.3 percent for the black African, coloured, and Indian populations, respectively. Hence, there is clearly a need to increase the number of PSET enrolments and graduates for historically underserved population groups if inequality in educational attainment across population groups is to be reduced.

FIGURE 6.1: Educational attainment levels of the working-age population (15–64 years), 2017



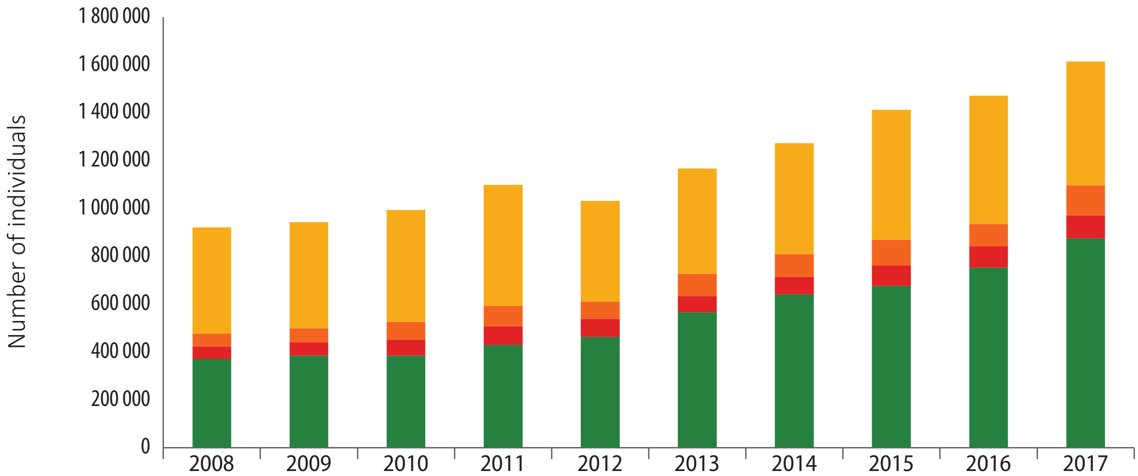
	Black African	Coloured	Indian/Asian	White	Total
Post-secondary	8.9	10.1	26.3	41.1	13
Secondary	26.7	27.1	40.9	36.4	27.8
Primary	58.6	59.6	30.4	20.7	54.9
No schooling	3	2.3	0.5	0.3	2.7

Source: Own calculations, General Household Survey (GHS, 2017)

Notes:
1. Percentages may not add up to 100 percent due to rounding.

Given that higher education (HE) is the major driver of knowledge creation and innovation in the economy, it is instructive to consider the number of individuals in the economically active population who hold university degrees. Figure 6.2 shows that the number of individuals with university degrees in the economically active population grew significantly over the period 2008–2017, from under a million to 1.6 million. This constitutes an increase of 8.4 percent per year on average. This increase is the result of both improved access to HE and population dynamics, with older people, who are generally less educated, reaching the normal retirement age and thus leaving this age group (DHET, 2019a). Growth in the number of graduates in the economically active Indian and black African population groups increased most significantly, at average annual rates of 14.5 percent and 15.1 percent, respectively.

FIGURE 6.2: Number of individuals in the working-age population with university degrees, 2008–2017

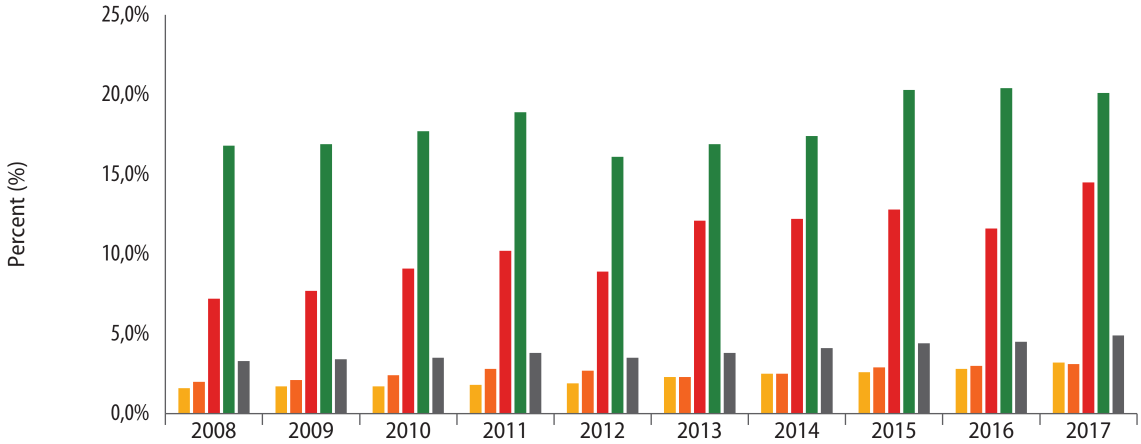


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
White	444 735	444 530	466 940	506 002	421 270	439 577	463 739	544 387	536 462	517 571
Indian/Asian	54 074	57 681	76 311	84 617	71 537	93 885	94 695	107 031	91 908	124 595
Coloured	51 790	56 817	65 573	78 255	75 954	68 436	74 066	85 756	90 044	97 572
Black African	371 030	384 289	384 736	429 865	463 258	565 439	640 518	676 199	753 154	874 973

Source: Own calculations, DHET (2019a)

Although Figure 6.2 shows that the black African population, due to its size, contains the largest number of individuals with degrees, Figure 6.3 reveals that the proportion of the economically active black African population with degrees – that is, the number of degree holders divided by the total size of the economically active African population – remained low in 2017, at 3.2 percent. Among the economically active white population group, the proportion of degree holders was 20.1 percent. These figures reflect remaining racial inequalities in terms of university access and graduation levels across different population groups in the economically active population.

FIGURE 6.3: Proportion of the economically active population with degrees by population group, 2008–2017



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Black African	1,6%	1,7%	1,7%	1,8%	1,9%	2,3%	2,5%	2,6%	2,8%	3,2%
Coloured	2,0%	2,1%	2,4%	2,8%	2,7%	2,3%	2,5%	2,9%	3,0%	3,1%
Indian/Asian	7,2%	7,7%	9,1%	10,2%	8,9%	12,1%	12,2%	12,8%	11,6%	14,5%
White	16,8%	16,9%	17,7%	18,9%	16,1%	16,9%	17,4%	20,3%	20,4%	20,1%
Total	3,3%	3,4%	3,5%	3,8%	3,5%	3,8%	4,1%	4,4%	4,5%	4,9%

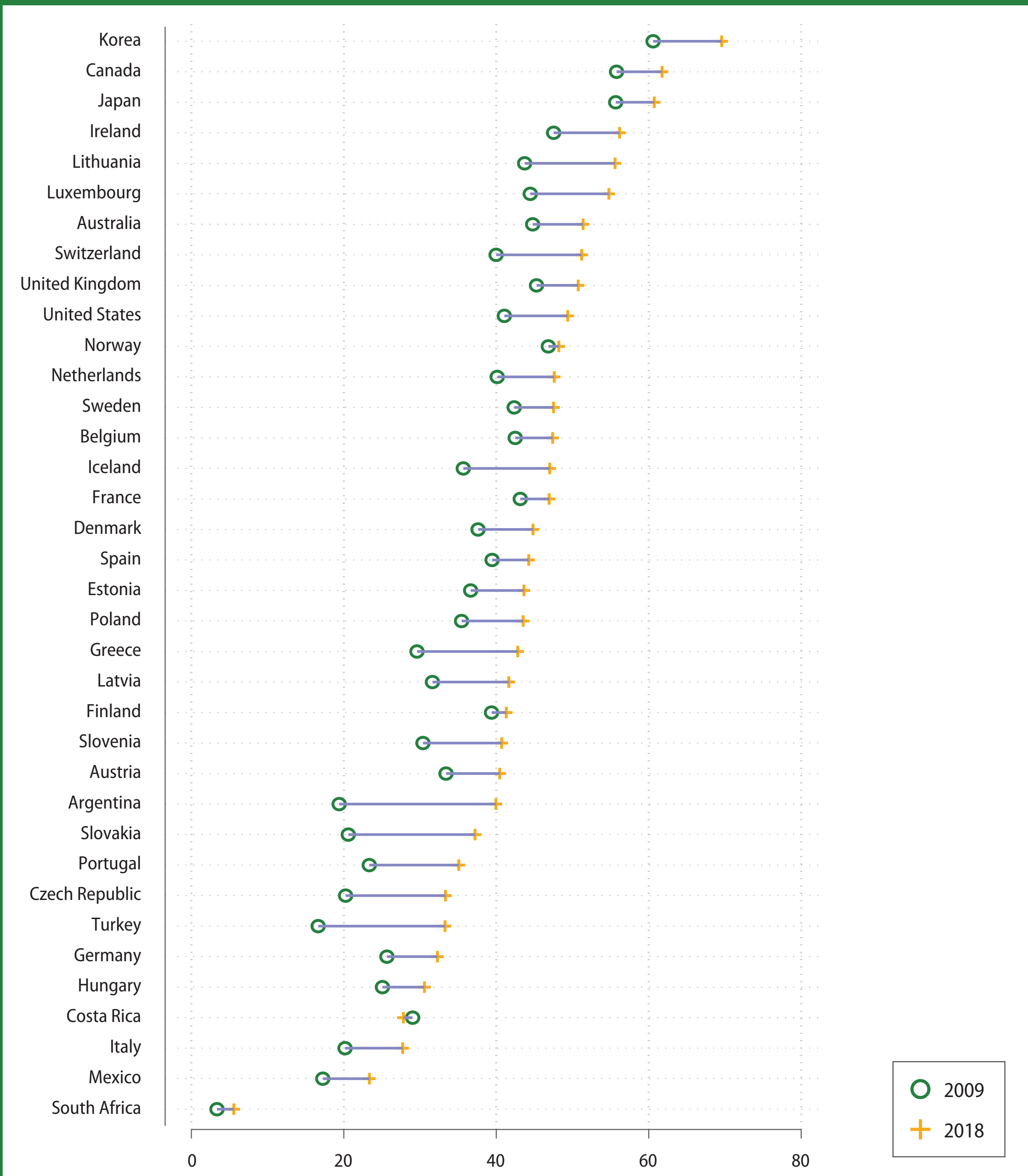
Source: Own calculations, DHET (2019a)

To reiterate, the trends in the skills profile of the economically active population indicate that the number of individuals with degrees has increased substantially over the period 2008–2017. The number of degree holders in the economically active black African and Indian populations has doubled. However, the disparate proportions of degree holders within different population groups remain reflective of apartheid inequalities, with a much higher proportion of the white economically active population having degrees than is the case for other population groups. The next section examines the extent to which these inequalities persist in the schooling and PSET systems, along with other key trends in skills supply.

Level of degree attainment: A comparison of South Africa and other countries

An important indicator for any emerging economy is the level of tertiary education and degree attainment within the population. Figure B.1 provides comparative data for a number of countries, including South Africa, on the proportion of 25- to 64-year-olds with tertiary education. Among the countries compared, South Africa has the lowest share of individuals with tertiary education. Its share did, however, increase between 2009 and 2018. In order to support the growth and productivity of the economy, the level of tertiary education in the population needs to improve.

FIGURE B.1: Percentage of tertiary-educated 25- to 64-year-olds, 2009 and 2018



Source: Organisation for Economic Co-operation and Development (OECD, 2019a)

Notes:

1. Countries are ranked in descending order according to the percentage of 25- to 64-year-olds who attained tertiary education in 2018.
2. The OECD defines tertiary education as an International Standard Classification of Education (ISCED) 5A programme that provides access to research-based programmes and professions with high skills requirements. This is different from the definition used by Statistics SA.

6.2. The schooling system

The schooling system prior to 1994 was highly fragmented and segregated by race, with education spending greatly favouring the white population. Moreover, the apartheid government deliberately provided low-quality education to black African and coloured learners. As such, building an inclusive education system committed to the pursuit of quality basic education for all has been one of the biggest challenges faced by government in the post-apartheid era. The importance of improving outcomes in basic education was underscored by President Cyril Ramaphosa in his 2019 State of the Nation Address (SONA), where he highlighted education as one of seven national priorities under his administration (DBE, 2020).

The DBE's role in shaping the skills profile of the population is articulated in two key policy documents: the National Development Plan (NDP) (National Planning Commission, 2013) and the National Skills Development Plan (NSDP) (DHET, 2019c). Both the NDP and the NSDP outline the DBE's mandate to improve outcomes in the basic education sector, with particular emphasis on improving outcomes in literacy, mathematics, and science, with a view to increasing the number of learners eligible for enrolment in science, engineering, and technology (SET) programmes at university. The ultimate goal of these targets is to increase the pool of individuals qualified for occupations in science and technology, which, as shown in Chapter 5, are in high demand. The DBE responded to the targets set out in these policy documents with the Action Plan to 2019 (DBE, 2015a), which detailed the priorities for the department for the period 2015–2019. The Action Plan outlines the importance of improving outcomes in the lower grades, and specifically literacy and numeracy in the foundation phase (DBE, 2015a). Other goals set by the DBE (2015a, p. 3) in response to the skills development targets articulated in the NDP and NSDP include:

- Increasing the number of learners who have mastered the minimum language and mathematics competencies, as set out in the curriculum;
- Ensuring that all children remain effectively enrolled at school up to at least age 15; and
- Increasing the number of Grade 12 learners who become eligible for bachelor's programmes at university.

Some of the largest gains in the basic education sector over the period 2009–2019 have occurred in mathematics and physical science performance, as targeted in the NDP and the NSDP. South Africa's performance in these subjects can be gauged through the country's results in the Trends in Mathematics and Science Study (TIMSS). The TIMSS is an international assessment administered to Grade 8 and 9 learners[15] in over 40 countries. Figure 6.4 shows South Africa's results in the 2011 and 2015 TIMSS assessments, which improved as fast as those of some of the fastest improving countries in the world (DBE, 2020). Estimates from the DBE (2020) suggest that if these improvements continue the country will reach its long-range targets in terms of Grade 9 mathematics and science performance. This constitutes a major achievement from the perspective of the supply of skills, since it points to improvements in the knowledge and competencies that learners acquire in the basic education system.

15 The TIMSS is administered to Grade 8 learners in most participating countries but is administered to Grade 9 learners in South Africa.

FIGURE 6.4: South Africa's TIMSS results, 2011–2015

	2011	2015
Mathematics	352	372
Science	332	358

Source: Zuze et al. (2017)

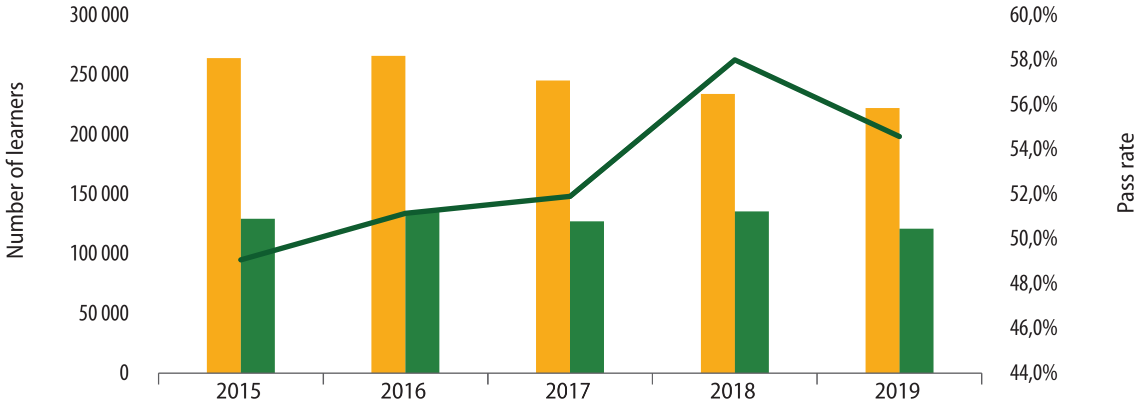
Notes:

1. TIMSS scores are standardised to have an international mean of 500 and a standard deviation of 100. The low international benchmark is 400 points; thus, in 2015, South Africa achieved a mathematics score roughly a third of a standard deviation below the low international benchmark and a physical science score roughly 40 percent of a standard deviation below the low international benchmark.

Improvements in mathematics and physical science in Grade 9 have occurred alongside improvements in these subjects at the Grade 12 level. Figure 6.5 and Figure 6.6 show the number of matric learners who passed mathematics and physical science, respectively, over the period 2015–2019 (the period targeted in the DBE's [2015a] Action Plan to 2019). It is important to note that the pass rate for these subjects is 30 percent, which is not a high enough level of achievement to render students eligible for enrolment in SET programmes at most South African universities. The trends presented in Figure 6.5 and Figure 6.6 should therefore only be considered as indicative of overall trends in mathematics and physical science performance. In other words, improvements in pass rates in these subjects are only important for skills planning to the extent that such improvements provide a rough indication of overall improved performance in these subjects. Only a subset of those who passed during the 2015–2019 period will have achieved the minimum requirements for entry into SET programmes at university, and unfortunately the data are unable to accurately reflect this subset's size in a given year or the trend over time.

In terms of performance in mathematics, Figure 6.5 shows that, although the number of candidates writing the mathematics examination decreased slightly, the mathematics pass rate increased steadily over the period 2015–2019, at an average rate of 1.4 percentage points per year. This constitutes notable progress towards the NDP's goal of improving matric mathematics results. Figure 6.6 shows that trends in matric physical science performance are even more encouraging, with the pass rate increasing notably from 58.6 percent in 2015 to 75.5 percent in 2019. However, it should be noted that, as in the case of mathematics, the number of learners writing the physical science matric examination decreased at an average annual rate of 2.5 percent over the period. Therefore, even though the pass rate increased at an average annual rate of 7.2 percent, the decline in the number of physical science candidates meant that growth in the number of learners who passed the physical science examination was only 2.4 percent per year on average. This is, though, still an impressive result. Realising the NDP's goal of increasing the number of learners eligible for enrolment in SET programmes at university will require increasing the number of matric candidates writing the mathematics and physical science examinations as well as improving the pass rates for these subjects, especially mathematics. If the improvements in Grade 9 mathematics and science results improve as anticipated, it is likely that the country will see commensurate increases in the number of learners who pass mathematics and physical science in matric, as targeted in the NDP.

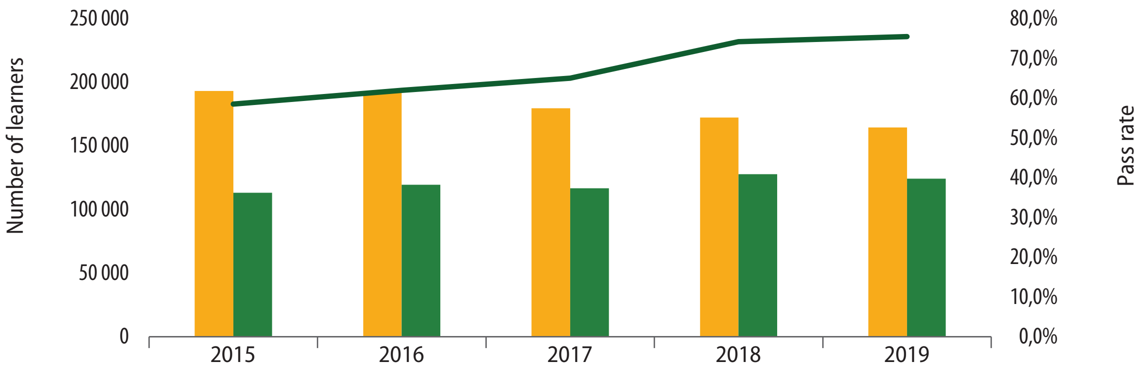
FIGURE 6.5: Number of students who wrote and passed matric mathematics, 2015–2019



	2015	2016	2017	2018	2019
Wrote	263 903	265810	245103	233 858	222 034
Passed	129 481	135958	127197	135 638	121 179
Pass rate	49,1%	51,1%	51,9%	58,0%	54,6%

Source: DBE (2015b, 2018, 2020)

FIGURE 6.6: Number of learners who wrote and passed matric physical sciences, 2015–2019



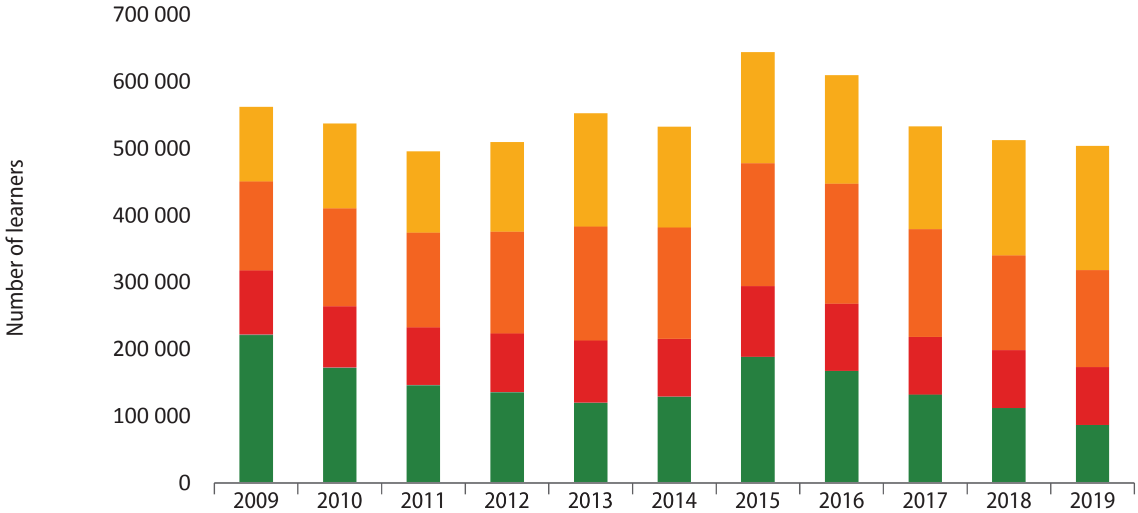
	2015	2016	2017	2018	2019
Wrote	193 189	192618	179561	172 319	164 478
Passed	113 121	119417	116862	127 919	124 237
Pass rate	58,6%	62,0%	65,1%	74,2%	75,5%

Source: DBE (2015b, 2018, 2020)

Efforts to increase the number of Grade 12 learners who pass matric and the number of learners who become eligible for bachelor's programmes at university have also been fruitful. The number of learners obtaining a matric qualification – the National Senior Certificate (NSC) – has increased at an average rate of 2.2 percent per year since 1994, and the number of learners achieving matric results that would allow them to enrol in bachelor's programmes at university has increased at an average annual rate of 4.3 percent (DBE, 2020). These trends suggest that the basic education system has produced increasing numbers of learners who have the skills required in the labour market and for entry into post-school education and training in the democratic era.

Figure 6.7 provides a more detailed view of the quality of matric passes for the period 2009–2019. The figure shows that the number of learners achieving bachelor's passes has increased at an average annual rate of 6.7 percent over this period – a significant improvement. This result is encouraging in light of the current skills mismatch in the labour market, since it implies that there are higher proportions of learners who qualify for undergraduate degree programmes in more recent matric cohorts than has historically been the case. Assuming that capacity constraints in universities are dealt with, this trend – combined with free HE for qualifying students – will likely lead to sharp increases in undergraduate degree enrolments.

FIGURE 6.7: Matric results, 2009–2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Bachelor	111 412	126 549	121 207	134 064	169 364	150 752	166 263	162 374	153 610	172 043	186058
Diploma	133 262	146 489	142 000	152 207	170 491	166 689	183 720	179 619	161 333	141 700	144 672
Higher certificate	95 834	91 486	85 839	87 524	93 082	86 022	105 770	100 486	86 265	86 790	86 790
SNE/NSC	644	760	568	428	255	411	72	68	99	99	105
Not achieved	221 429	172 086	146 215	135 658	119 881	532 860	644 536	610 178	534 484	512 735	504 303

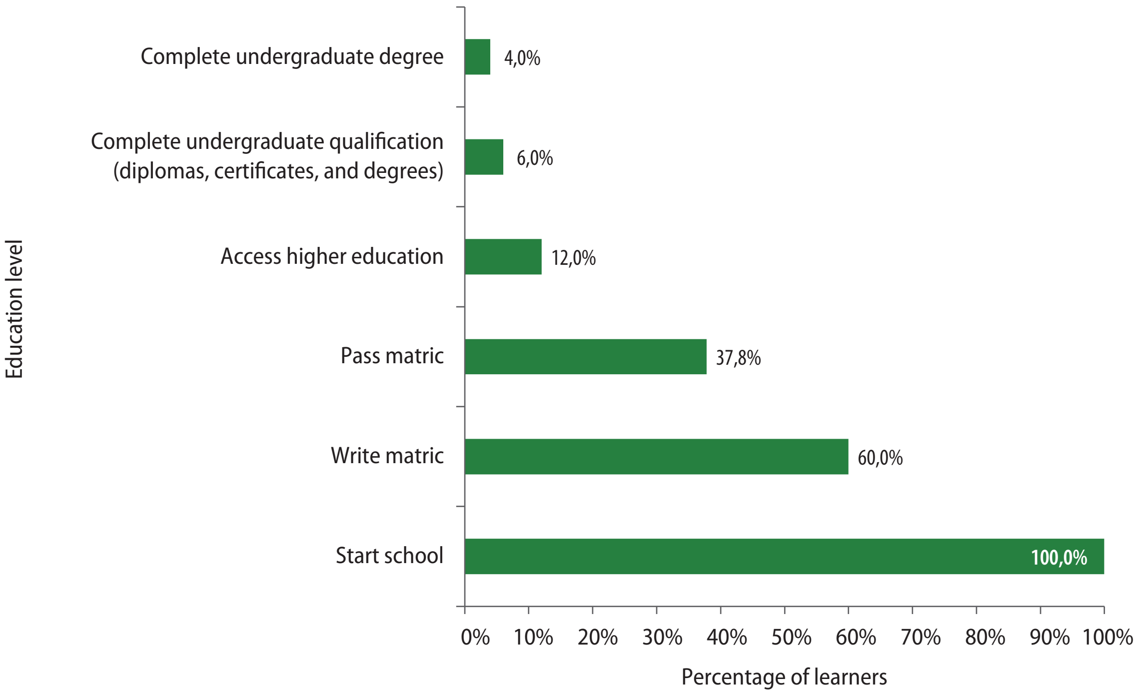
Source: DBE (2014, 2015, 2016, 2017, 2018, 2020); van Broekhuizen, van der Berg, and Hofmeyr (2016)

Despite these improvements, major challenges in the basic education sector remain. Apartheid's legacy of deliberately providing inferior education along racial lines continues to plague the South African schooling system in the sense that the majority of learners receive a quality of education that does not adequately prepare them for the labour market or for post-school education. This issue can be seen in slow progression and high dropout rates throughout the system, especially in later grades. It is important to keep this context in mind when evaluating the matric results presented in Figure 6.7. Figure 6.8[16] shows how high dropout and slow progression rates impact the size of the pool of learners who go on to write the matric examination. The figure shows that, of all learners who start school, only about 60 percent write the matric examinations 12 years later. This means that the number of learners who pass matric as a proportion of the total number of learners who started schooling 12 years earlier is much lower than the matric pass rates presented in Figure 6.6. For the 2008 matric cohort, for example, the matric pass rate was 63 percent (van Broekhuizen, van der Berg, & Hofmeyr, 2019); however, taking

16 The estimates in Figure 6.8 were calculated by van Broekhuizen, van der Berg, and Hofmeyr (2018) for an earlier LMIP report, *Post-School Education and the Labour Market in South Africa* (Rogan, 2018). These estimates are based on data from the 2008 matric cohort, and figures are estimated using integrated unit-level 2008 NSC and 2009–2014 Higher Education Management Information System data. While there are indications that progression rates through the schooling and higher education systems improved for matric cohorts after 2008, estimates based on later matric cohorts are not yet available.

into account the fact that only approximately 60 percent of learners who started school 12 years earlier wrote the matric examination, the proportion of learners who passed matric in 2008 is only 38 percent. According to these estimates, only 12 percent of the original matric cohort who started school in 2008 would go on to access HE, only 2 percent would go on to complete an undergraduate diploma or certificate, and only 4 percent would go on to complete an undergraduate degree within six years of matriculating. Thus, while there have been improvements in matric results over the period 2009–2019, it is still the case that the majority of learners who start school do not pass matric and that only a small proportion go on to access HE. Accordingly, significant improvements in the basic education sector, especially in the earlier grades, are required to address the skills imbalances in the labour market.

FIGURE 6.8: Estimated education pipeline for South Africa, based on the 2008 matric cohort



Source: van Broekhuizen, van der Berg, and Hofmeyr (2018)

A host of research has shown that educational trajectories are formed early, so that by Grade 4 the educational trajectories of most learners are already established (see, for example, van der Berg & Hofmeyr, 2018). Van der Berg et al. (2016) explain that approximately 58 percent of South African children do not learn to read for meaning in any language by Grade 4. Coupled with a curriculum that assumes children have learned to read by the end of Grade 3, this means that the curriculum becomes inaccessible for the majority of South African children as early as Grade 4, thus pushing most children who start school to the periphery of the learning process (van der Berg et al., 2016). President Ramaphosa responded to this situation by declaring reading for meaning an apex priority in the basic education sector and establishing the National Reading Coalition in the 2019 SONA. The president further stated:

> Early reading is the basic foundation that determines a child's educational progress, through school, through higher education, and into the workplace…All other interventions – from the work being done to improve the quality of basic education to the provision of free higher education for the poor, from our investment in TVET colleges to the expansion of workplace learning – will not produce the results we need unless we first ensure that children can read. (South African Government, 2019)

Prioritising reading in the early grades is an important first step towards improving outcomes throughout the basic education system. Efforts to prioritise reading can so far be seen in the introduction of interventions aimed at improving reading, such as the Early Grade Reading Study. The effectiveness of such programmes will only become evident once enough time has passed to be able to evaluate their impact.

The results reported in this section point to a basic education system that is improving in preparing learners for the labour market or for success in HE. However, despite impressive gains, ongoing slow progression and high dropout rates result in many learners leaving school without having obtained adequate skills for employment or further education and training. Prioritising reading in the foundation phase constitutes an important step in the right direction, since improving reading in the early grades is likely to improve progression rates and reduce dropout rates throughout the system. The next section presents trends in the PSET system, with a view to demonstrating how trends in this sector are likely to impact on the supply of skills.

6.3. The post-school education and training system

6.3.1. Overview of the post-school education and training system

South Africa has made remarkable gains in terms of transforming the highly fragmented, racially segregated, and discriminatory education system inherited from the apartheid government in 1994. Higher education institutions (HEIs) were racially segregated, and the institutions serving black African, coloured, and Indian South Africans deliberately offered limited tertiary education opportunities (CHE, 2010). Institutions reserved for whites were favoured in terms of both funding and programme offerings (CHE, 2010). As a consequence, a major challenge for the post-apartheid government has been promoting equitable access to PSET institutions. A related challenge has been integrating the fragmented HE system and reversing racial discrimination in funding and quality. This section evaluates the extent to which these challenges have been addressed in the post-apartheid era, while also discussing the implications of these trends in the PSET system for skills planning.

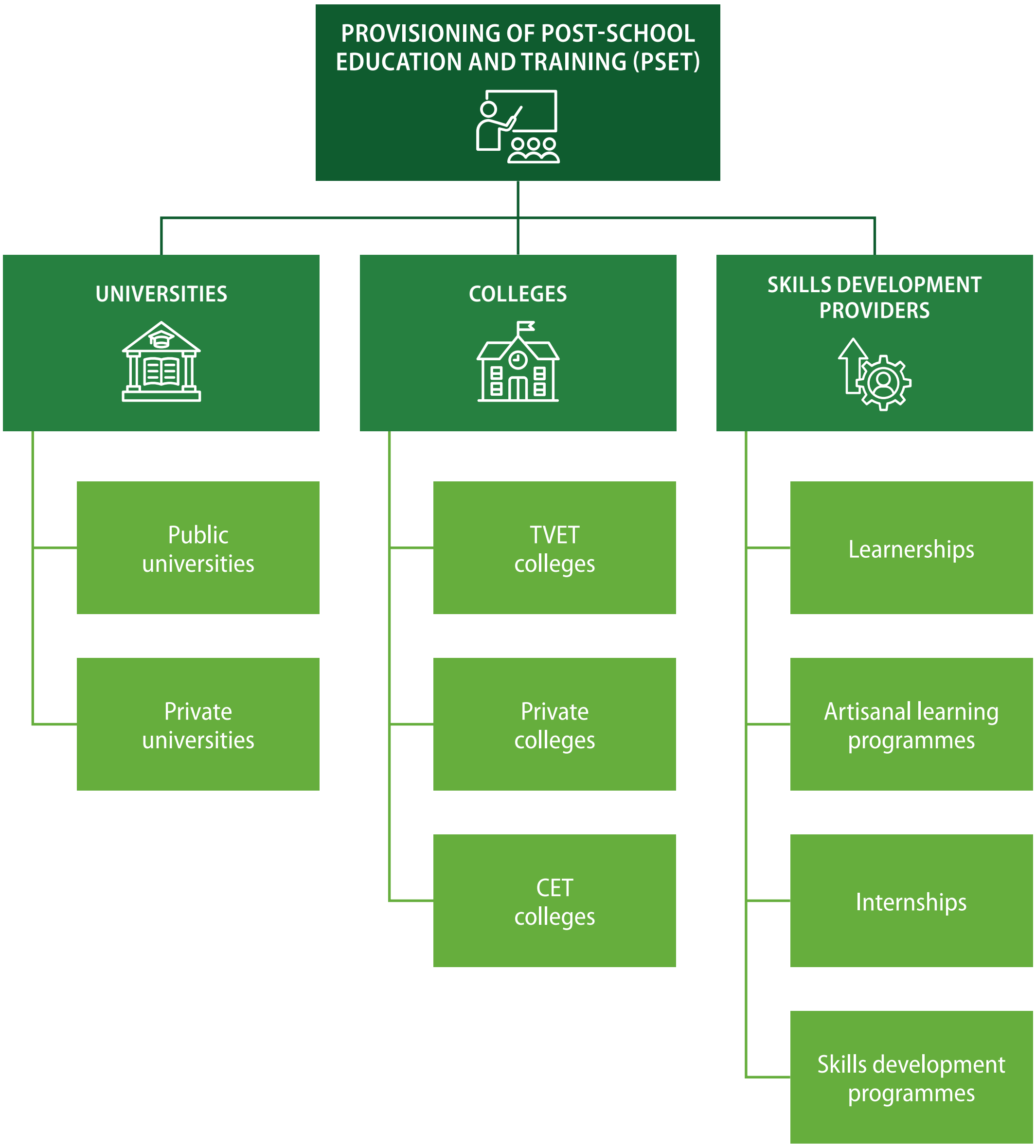
Like the DBE's mandate, the DHET's mandate in terms of skills development is also articulated in the NDP and NSDP. The DHET (2013) responded to the targets set in the NDP and NSDP with the White Paper on Post-School Education and Training (WPPSET), where the department outlined its plans for reaching these targets. The NDP calls for the development of a PSET sector that provides opportunities for social mobility and produces the skills and knowledge the country needs in order to meet government's social and economic development targets. The NSDP emphasises that upholding this mandate requires that the PSET sector be responsive to the skills needs of employers in both the public and the private sector, as well as to South Africa's broader societal and developmental objectives. The specific targets aimed at reaching these broad goals, articulated in the WPPSET (DHET, 2013), include:

- Expanding enrolment at technical and vocational education and training (TVET) colleges to 2.5 million by 2030;
- Enhancing the quality of TVET colleges by improving their management and governance, developing the quality of teaching and learning, and improving alignment between TVET programmes and the skills demanded in the labour market;
- Increasing enrolment at universities to 1.62 million by 2030;
- Increasing the number of black African and women postgraduates, especially PhDs;
- Expanding access to workplace training opportunities; and
- Establishing community education and training (CET) colleges as a means of addressing poor numeracy and literacy among individuals with low levels of education and limited prospects in the labour market.

While institutional mergers over the period 2003–2005 succeeded in creating a less fragmented PSET system, significant resourcing and quality differences remain between institutions that historically served white students and those that served other racial groups (CHE, 2010). At the same time, technological change and the greater integration of the South African economy with the rest of the globe has resulted in changes in the structure of the local economy, with skilled labour becoming highly sought after by employers (DHET, 2019a). Skills planning since the political transition has thus had to address a major skills backlog at a time when skilled labour has become increasingly important for economic growth. This section examines the extent to which the DHET has managed to address the twin challenges of addressing the country's skills backlog and reversing existing racial patterns in PSET opportunities.

The PSET system offers individuals various pathways for continuing their learning after leaving the schooling system. Figure 6.9 depicts the three key subsectors in the PSET system: public and private universities, or HEIs; colleges, encompassing TVET colleges, private colleges, and CET colleges; and Sectoral Education and Training Authorities (SETAs).

FIGURE 6.9: Overview of the PSET system



Source: Council on Higher Education (2017)

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In 2017, the PSET system consisted of 26 public universities, 125 private universities, 50 TVET colleges, 268 registered private colleges, and 9 CET colleges (DHET, 2019b). The qualifications – defined as registered and quality-assured sets of learning outcomes within the South African National Qualifications Framework (NQF) – offered at these universities and colleges include certificates, diplomas, and degrees. Additionally, there are 21 SETAs.

Although enrolment at public universities grew markedly over the 2008–2017 period, enrolment will have to grow even faster to meet the targets stipulated in the WPPSET. In addition to these public universities, there is a growing subsector of private universities, which offer locally or internationally accredited degree programmes (DHET, 2019a).

TVET colleges offer programmes that are vocational or occupational by nature, and the skills taught in these programmes often have direct application to the workplace (DHET, 2019a). The DHET (2019a, p. 3) explains that, "[a]ccording to the NDP, TVET colleges have a critical role to play in the development of intermediate, practical and employable skills with the aim of reducing skills shortages and thereby also youth unemployment".

CET colleges are intended to cater mainly for youths and adults who did not complete their schooling and therefore do not qualify to study at HEIs. While previously aimed at improving adult literacy and numeracy skills, CET colleges are increasingly becoming institutions that offer individuals who are not in employment, education, or training (NEETs) "second-chance" opportunities to improve their labour market prospects.

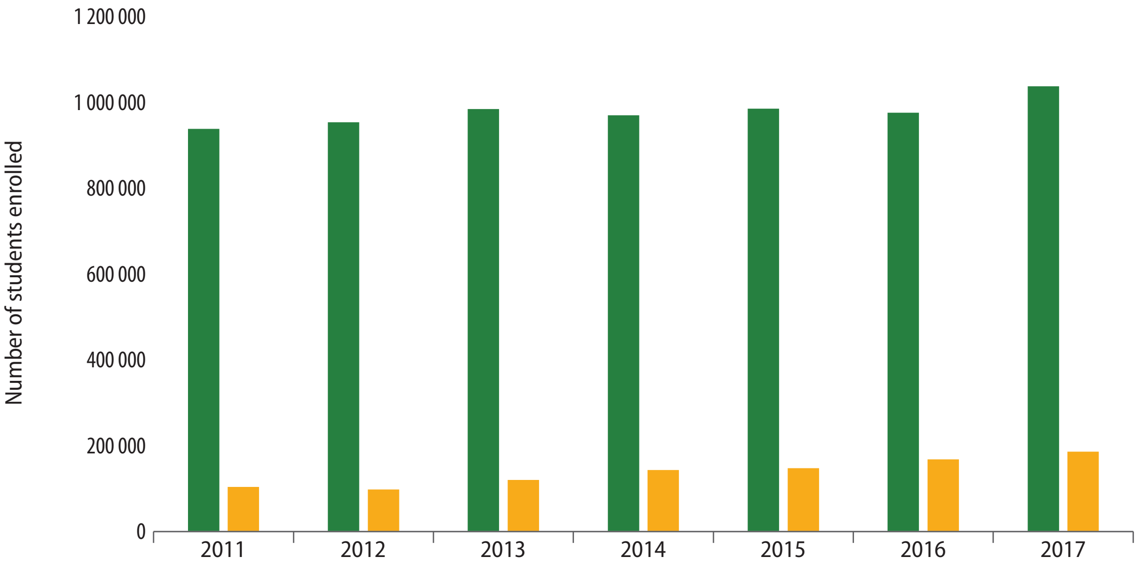
SETAs act as a bridge between formal education and the labour market by facilitating workplace-based education and training. SETAs do not directly offer qualifications but rather assist with skills development interventions, providing a pathway towards the attainment of a qualification. Examples of the skills development interventions promoted by SETAs include learnerships, artisanal learning programmes, internships, and skills development programmes, as well as bursaries for tuition fees, which are granted on the basis of financial need.

6.3.2. Higher education

The HE subsector forms part the PSET system, comprising public and private universities. The majority of students in the HE system are enrolled at public universities (DHET, 2019a).

Growth in the number of learners who qualify for university entry, as discussed in Section 6.2, has been accompanied by increased university enrolments, such that, in 2017, there were 1.2 million students enrolled at universities (public and private) (DHET, 2019b). Most university enrolments were at public institutions, which accounted for 82.2 percent of total university enrolments in 2017. Figure 6.10 shows the growth in university enrolments (public and private) for the period 2011–2017. The number of students enrolled at public universities increased at an average annual rate of 1.7 percent over the six-year period. Enrolments at private universities also increased over the period, making these institutions increasingly important contributors to skills development in the country. Collectively, private universities enrolled 185 046 students in 2017 and saw an average annual growth rate of 10.3 percent between 2011 and 2017.

FIGURE 6.10: Number of students enrolled at public and private universities, 2011–2017



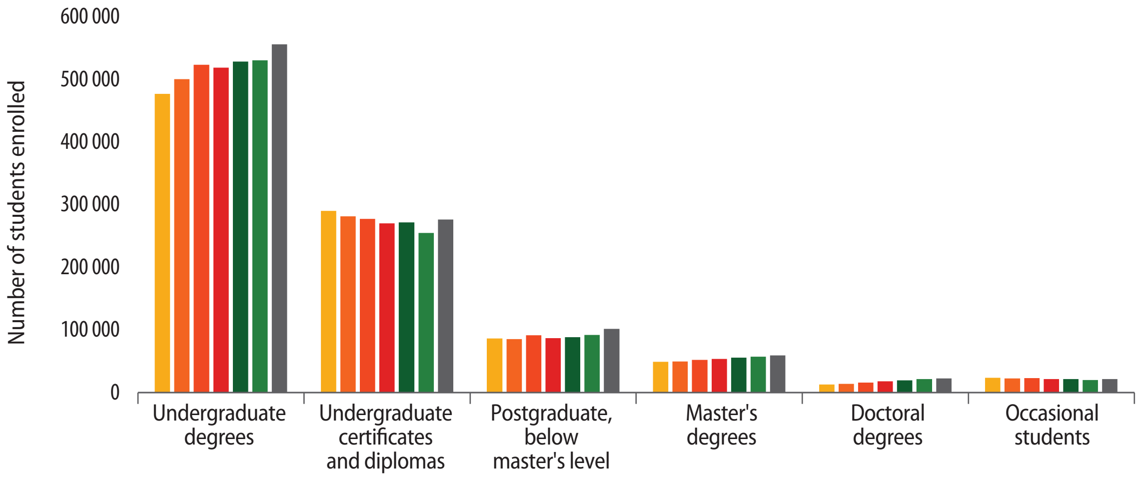
	2011	2012	2013	2014	2015	2016	2017
Public	938 201	953 373	983 698	969 155	985 212	975 837	1 036 984
Private	103 036	97 478	119 941	142 557	147 210	167 408	185 046

Source: DHET (2019b)

Although the growth in university enrolments is encouraging, it must be kept in mind that South Africa's gross enrolment ratio (GER) – that is, the number of individuals enrolled at university expressed as a proportion of the total number of individuals aged 19–24 – is still lower than that of countries at similar levels of development, such as Brazil and India. Since public universities make up the majority of total enrolment in HE, enrolments at public universities will have to grow faster than has been the case in recent years in order for South Africa's GER to match that of its middle-income country peers.

Figure 6.11 shows that the growth in total enrolments at public universities over the period 2011–2017 has been largely driven by growth in undergraduate degree enrolments, which account for just over 80 percent of the total growth in public university enrolments shown in Figure 6.10. Undergraduate degree enrolments constituted 53.6 percent of total public university enrolments in 2017 and grew at an average rate of 2.6 percent over the six-year period. In line with the goals set out in the NSDP, enrolments for postgraduate qualifications also grew substantially over this period, with enrolments for postgraduate degrees below master's level increasing at an average rate of 2.8 percent each year and enrolments for master's degrees growing at 3.2 percent per year, on average. The increase in enrolments for PhD degrees over this period is substantial, with an average growth rate of 9.9 percent per year. It is interesting to note that the number of students enrolled for undergraduate certificates and diplomas decreased at an average annual rate of 0.8 percent. This is in sharp contrast to the increasing trend in enrolments for all other qualification types over this period, particularly enrolments for undergraduate degrees.

FIGURE 6.11: Number of students enrolled at public universities by qualification type, 2011–2017

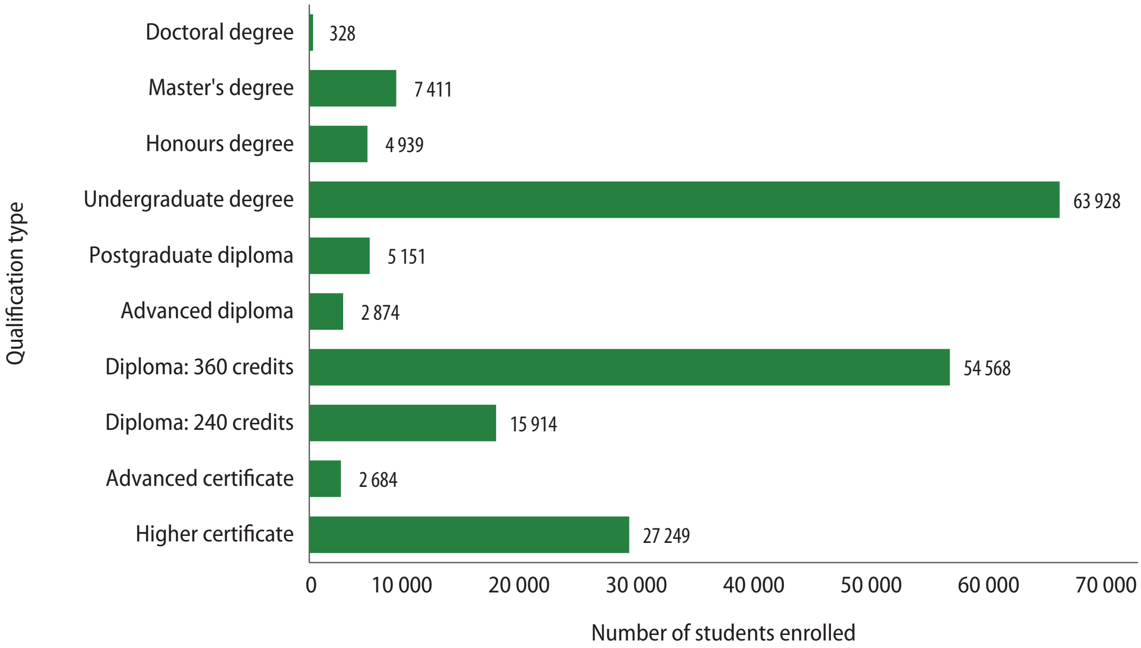


	Undergraduate degrees	Undergraduate certificates and diplomas	Postgraduate, below master's level	Master's degrees	Doctoral degrees	Occasional students
2011	476 841	289 931	86 188	48 873	12 832	23 536
2012	500 429	281 280	85 501	49 561	13 965	22 637
2013	523 431	277 322	91 494	52 217	16 039	23 195
2014	518 859	270 251	86 730	53 675	17 943	21 697
2015	528 145	271 845	88 602	55 546	19 513	21 561
2016	530 361	254 990	91 866	57 290	21 510	19 820
2017	555 892	276 459	101 450	59 153	22 572	21 458

Source: DHET (2019b)

Figure 6.12 shows enrolments at private universities by qualification type in 2017. As was the case for public universities, undergraduate degrees accounted for the largest share (34.5 percent) of enrolments at private universities. Private enrolments constitute 10.3 percent of total undergraduate degree enrolments in the country.

FIGURE 6.12: Enrolments at private universities by qualification type, 2017

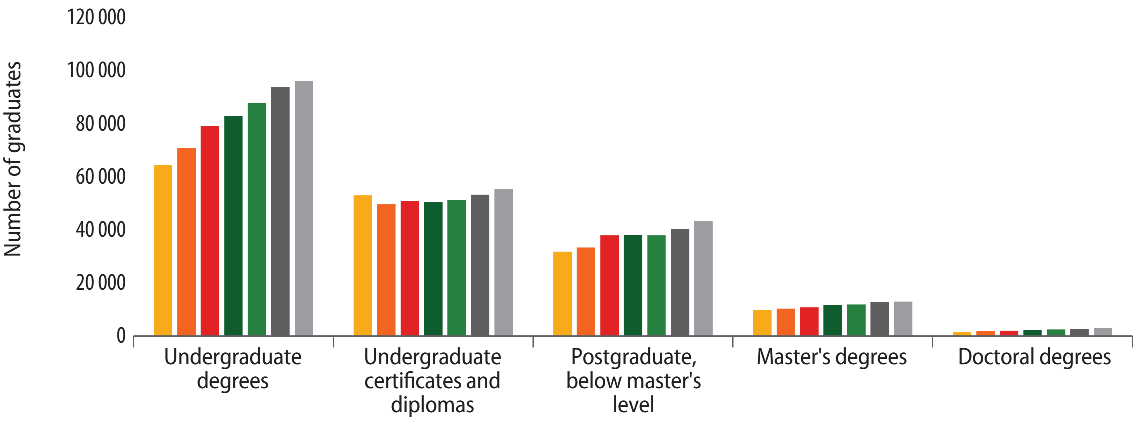


Source: DHET (2019b)

6.3.2.1. Success. Improvements in access to university will only meaningfully impact on the supply of skills available in the labour market if new entrants into the HE system successfully obtain their qualifications. In this sense, it is instructive to consider indicators of university success (such as graduation and completion rates) alongside university enrolment patterns.

Figure 6.13 shows that the number of public university students graduating from undergraduate degrees increased from 64 551 in 2011 to 96 120 in 2017, constituting an average annual growth rate of 6.9 percent. The number of students graduating with postgraduate degrees below master's level grew at an average rate of 5.3 percent over the period, and the number of students graduating with master's degrees grew by 5 percent per year. The number of students graduating with doctoral degrees grew the fastest, at an average rate of 11.7 percent per year – although this is off a relatively low base.

FIGURE 6.13: Number of graduates from public universities by qualification type, 2011–2017



	Undergraduate degrees	Undergraduate certificates and diplomas	Postgraduate, below master's level	Master's degrees	Doctoral degrees
2011	64 551	53 012	31 801	9 690	1 576
2012	70 743	49 654	33 385	10 334	1 879
2013	79 136	50 913	37 913	10 809	2 051
2014	82 856	50 515	38 117	11 627	2 258
2015	87 717	51 388	37 953	11 936	2 530
2016	93 915	53 289	40 213	12 862	2 797
2017	96 120	55 426	43 377	12 951	3 057

Source: DHET (2019b)

6.3.2.2. Equity. Improvements in overall access to and success in HE has to be viewed alongside improvements for particular population groups. In the South African context, the gender and racial composition of enrolments and graduations represents an important dimension of equity in HE. Between 2010 and 2016, the most rapid growth in public university enrolments occurred among black African students, at an average annual growth rate of 2.8 percent, resulting in black African students accounting for an increasing share of all students enrolled at public universities, from 66.7 percent in 2010 to 71.9 percent in 2016 (DHET, 2019a). Figure 6.14 shows that black African women made up the largest share of total enrolments in public universities in 2017, at 43.1 percent. Black African men constituted the second largest share of total enrolments, at 30.6 percent. It is also clear from the figure that female enrolments outnumber male enrolments for all population groups, with an especially large gender gap in favour of women among black Africans.

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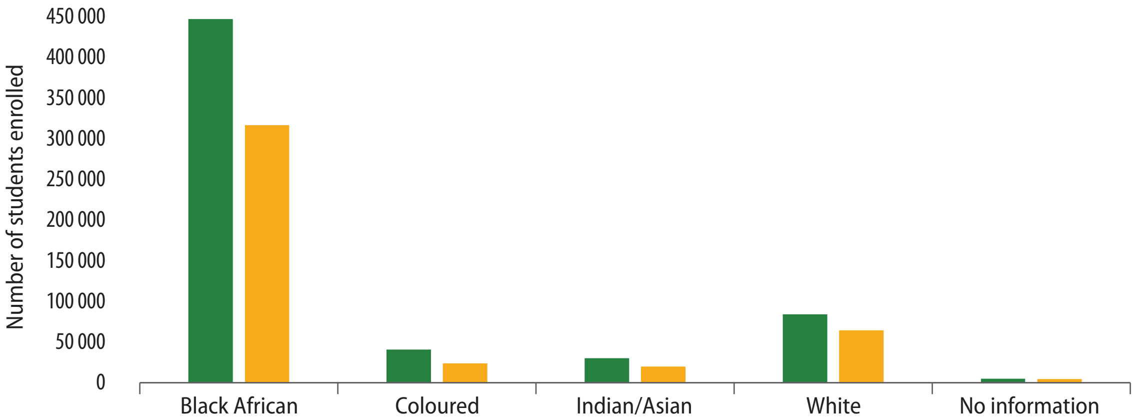
FIGURE 6.14: Number of students enrolled at public universities by population group and gender, 2017

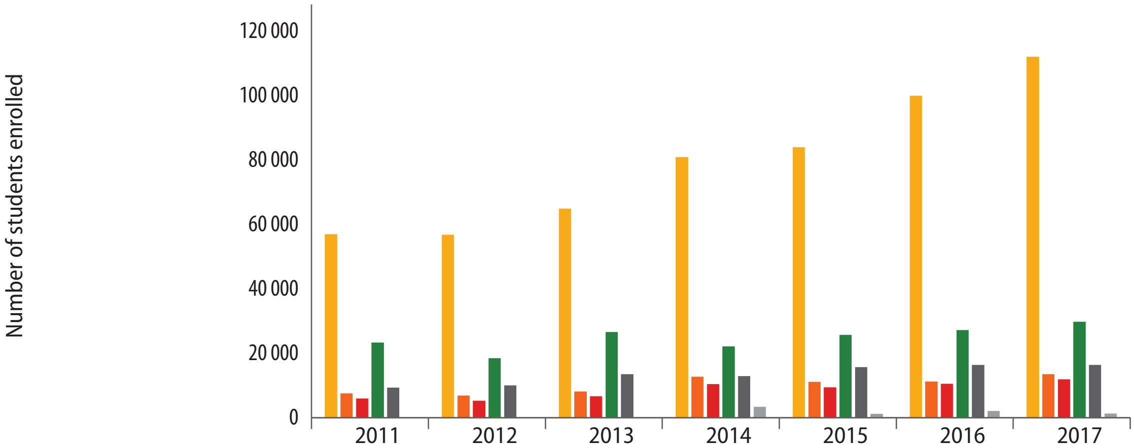


	Black African	Coloured	Indian/Asian	White	No information
Female	446 946	40 739	30 018	84 174	5 021
Male	316 808	24 031	20 113	64 626	4 487

Source: DHET (2019b)

Figure 6.15 shows that black African students also made up the bulk of the share of enrolments at private universities for the period 2011–2017. The share of black African students at private universities ranged between 55 percent and 61 percent over this period, which is slightly smaller than their share of enrolments at public universities, as shown in Figure 6.14.

FIGURE 6.15: Enrolments at private universities by population group, 2011–2017

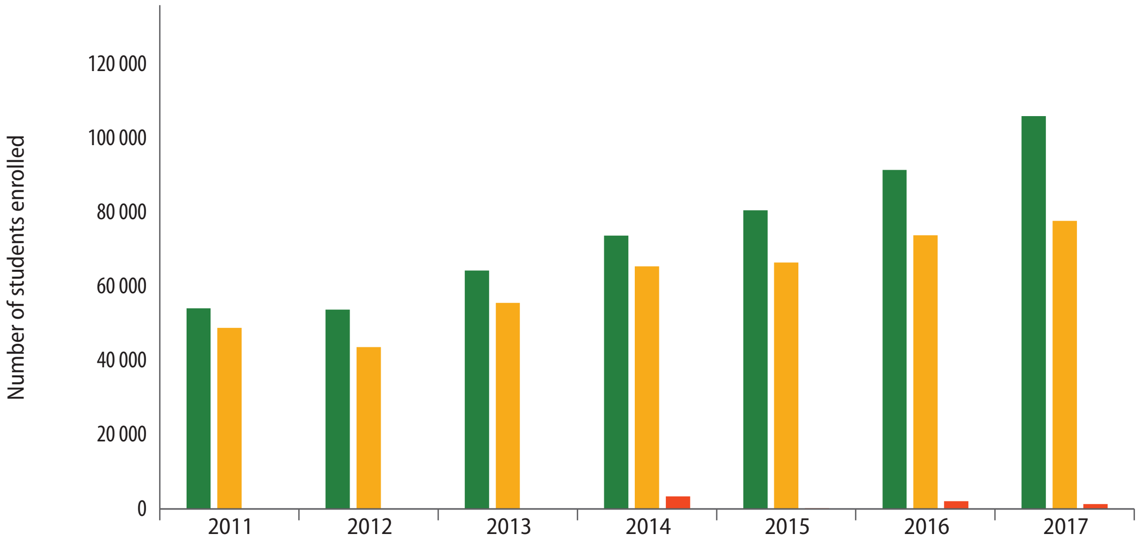


	2011	2012	2013	2014	2015	2016	2017
Black African	56 988	56 813	64 933	80 983	83 997	99 972	112 124
Coloured	7 526	6 876	8 183	12 716	11 127	11 223	13 491
Indian/Asian	5 913	5 222	6 649	10 396	9 456	10 494	11 955
White	23 311	18 500	26 664	22 191	25 740	27 212	29 780
Non-South African student	9 298	10 067	13 512	12 921	15 670	16 393	16 387
Unspecified	–	–	–	3 350	1 220	2 114	1 309

Source: DHET (2019b)

Figure 6.16 shows enrolments at private universities by gender for the period 2011–2017. Similarly to enrolments at public universities, private university enrolments are dominated by women, with the gender gap in favour of women increasing over the period, from 10.1 percent in 2011 to 36.3 percent in 2017.

FIGURE 6.16: Enrolment at private universities by gender, 2011–2017

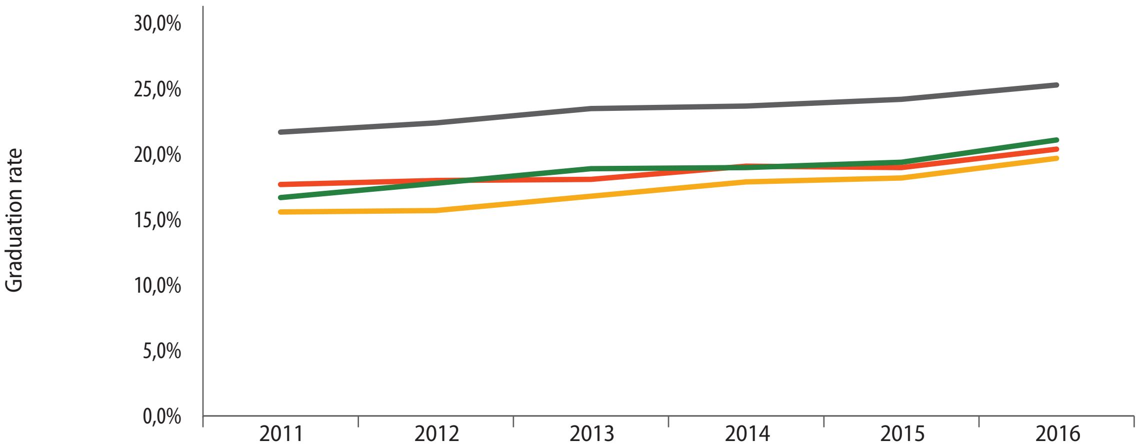


	2011	2012	2013	2014	2015	2016	2017
Female	54 160	53 774	64 335	73 776	80 532	91 493	105 983
Male	48 876	43 704	55 606	65 431	66 516	73 801	77 754
Unspecified	–	–	–	3 350	162	2 114	1 309

Source: DHET (2019b)

It is important to note that there are still significant racial differences in graduation rates (DHET, 2019a). Figure 6.17 shows that, while graduation rates among all population groups increased over the period 2011–2016, the graduation rate of white students remained higher than that of other population groups. The graduation rate of Indian students grew the fastest over this period, at an average annual rate of 4.8 percent.

FIGURE 6.17: Graduation rates at public universities by population group, 2011–2016



	2011	2012	2013	2014	2015	2016
Black African	15,7%	15,8%	16,9%	18,0%	18,3%	19,8%
Coloured	17,8%	18,1%	18,2%	19,2%	19,1%	20,5%
Indian/Asian	16,8%	17,9%	19,0%	19,1%	19,5%	21,2%
White	21,8%	22,5%	23,6%	23,8%	24,3%	25,4%

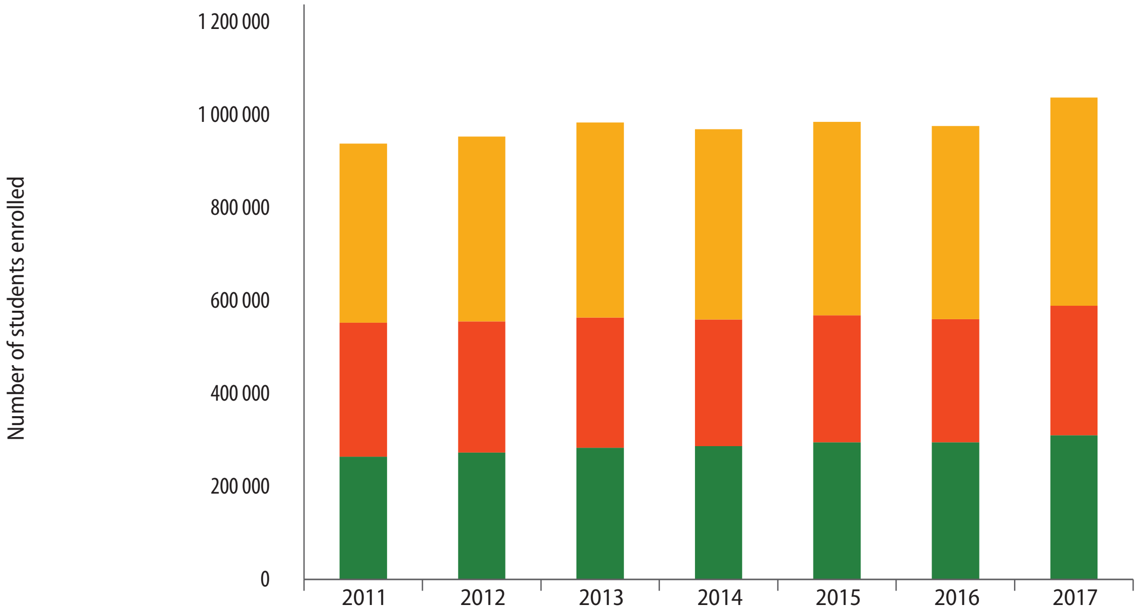
Source: DHET (2019a)

Notes:

1. The graduation rate is defined as the number of graduates in a year divided by the total number of students enrolled in that particular year.

6.3.2.3. Enrolments and graduations by field of study. From the perspective of the specific types of skills that are produced in the HE subsector, it is instructive to consider enrolment and graduation patterns in different fields of study. The major fields of study in South Africa are classified according to the Classification of Educational Subject Matter (CESM), which distinguishes between science, engineering, and technology (SET); business and management; and humanities. Figure 6.18 indicates that enrolments in SET programmes grew most rapidly over the 2011–2017 period, at an average annual rate of 2.7 percent. Enrolments in humanities programmes grew from 385 265 to 447 939, representing an average growth rate of 2.5 percent per year, while enrolment in business and management programmes declined slightly, at an average rate of 0.6 percent per year. These differences in the growth of enrolments for each CESM field resulted in changes in the share of total enrolments accounted for by each field. Enrolments in SET programmes increased as a proportion of total enrolments, from 28.1 percent in 2011 to 29.9 percent in 2017. Enrolments in humanities programmes as a share of total enrolments remained roughly the same for the duration of the seven-year period, while enrolments in business and management programmes made up 26.9 percent of total public university enrolments in 2017, down from 30.8 percent in 2011.

FIGURE 6.18: Public university enrolments by CESM field of study, 2011–2017

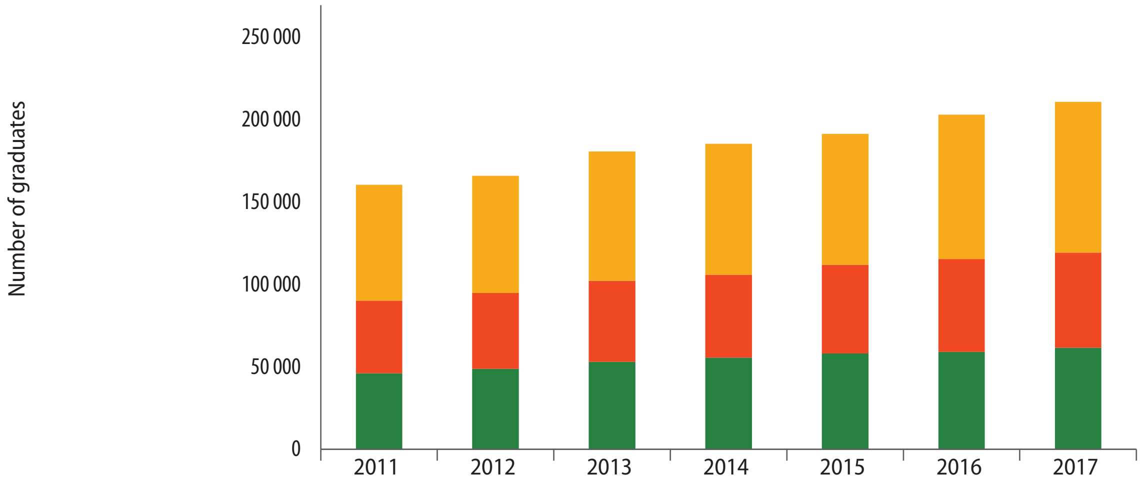


	2011	2012	2013	2014	2015	2016	2017
Humanities	385 265	397 792	420 122	409 525	416 449	415 521	447 939
Business and management	288 487	282 299	279 954	272 409	273 828	264 934	278 930
SET	264 447	273 282	283 622	287 221	294 935	295 383	310 115

Source: DHET (2019b)

The number of students graduating from SET programmes grew the most over the period, with growth averaging 4.9 percent per year (Figure 6.19). The average annual growth rate in the number of graduates from business and management programmes was 4.6 percent over the period, while graduations from humanities programmes grew at an average rate of 4.5 percent per year. The share of graduates from each CESM field remained roughly constant over the respective period under review, with graduations from humanities programmes making up the largest share of all graduations, at around 43 percent. SET graduations made up around 29 percent of total graduations for the duration of the period, and graduations from business and management programmes accounted for around 27 percent of all graduations.

FIGURE 6.19: Number of graduates from public universities by CESM field of study, 2011–2017



	2011	2012	2013	2014	2015	2016	2017
Humanities	70 363	71 096	78 596	79 420	79 571	87 587	91 578
Business and management	44 155	46 042	49 051	50 381	53 863	56 364	57 772
SET	46 100	48 848	53 176	55 574	58 090	59 125	61 581

Source: DHET (2019b)

The situation was reversed in private universities, where the vast majority of students were enrolled in business, commerce, and management skills programmes: 61.2 percent of the total, or 113 287 total enrolments (Table 6.1).

TABLE 6.1: Enrolments at private universities by NQF field, 2017

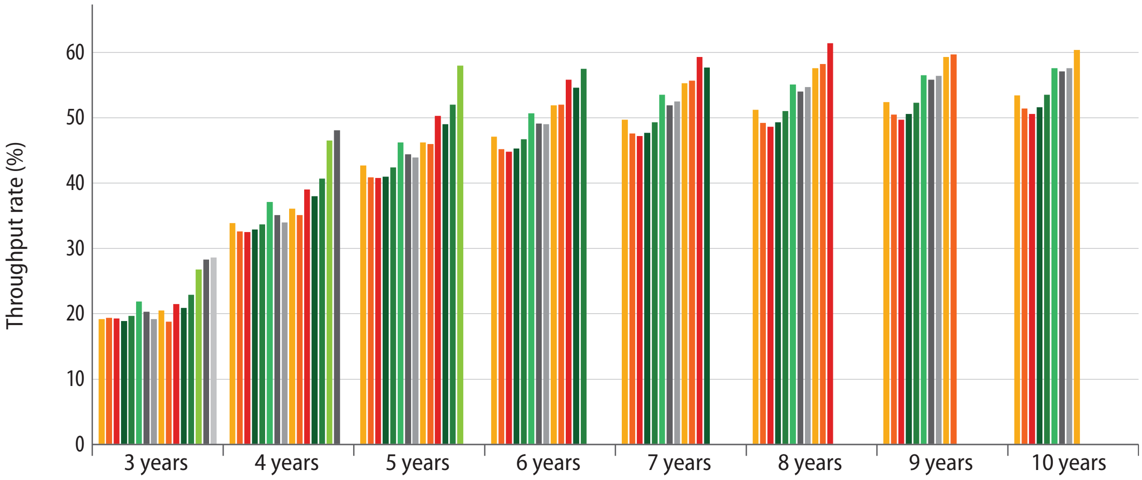
NQF FIELD	NUMBER OF STUDENTS
Agriculture and nature conservation	364
Culture and arts	9 470
Business, commerce, and management skills	113 287
Communication studies and language	9 575
Education, training, and development	12 799
Manufacturing, engineering, and technology	636
Human and social sciences	7 625
Law, military science, and security	3 996
Health sciences and social services	4 652
Physical, mathematical, computer, and life sciences	17 017
Services	5 296
Physical planning and construction	329

Source: DHET (2019b)

It is clear from the evidence presented in this section on HE that access to both public and private universities, as well as the number of graduates entering the labour market, increased over the period 2009–2017. While it is instructive from a skills supply point of view to consider trends in enrolment and graduation rates, this analysis does not provide information about the overall efficiency of the HE subsector: that is, the rate at which enrolments are converted to qualifications. The remainder of this section addresses this question by considering throughput rates at public universities.

Figure 6.20 shows the throughput rates for three-year undergraduate degree programmes at public universities. The first column represents the percentage of a given first-time entering (FTEN) undergraduate three-year degree programme cohort that successfully completed their studies within the specified three years. The throughput rates in each column thereafter are cumulative percentages: each column represents the percentage of the respective cohort that took between three years and the specified number of years to successfully complete their three-year degree programme.

FIGURE 6.20: Throughput rates for three-year undergraduate degree programmes at public universities, 2000–2015



	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
2000	19,2	33,9	42,7	47,1	49,7	51,2	52,4	53,4
2001	19,4	32,6	40,9	45,2	47,6	49,2	50,5	51,4
2002	19,3	32,5	40,8	44,8	47,2	48,6	49,7	50,6
2003	18,9	32,9	41	45,3	47,7	49,3	50,6	51,6
2004	19,7	33,7	42,4	46,7	49,3	51	52,3	53,5
2005	21,9	37,1	46,2	50,7	53,5	55,1	56,5	57,6
2006	20,3	35,1	44,4	49,1	51,9	54	55,8	57,1
2007	19,2	34	43,9	49	52,5	54,7	56,4	57,6
2008	20,5	36,1	46,2	51,9	55,3	57,6	59,3	60,4
2009	18,8	35,1	46	52	55,7	58,2	59,7	–
2010	21,5	39	50,3	55,8	59,3	61,4	–	–
2011	20,9	38	49	54,6	57,7	–	–	–
2012	22,9	40,7	52	57,5	–	–	–	–
2013	26,8	46,5	58	–	–	–	–	–
2014	28,3	48,1	–	–	–	–	–	–
2015	28,6	–	–	–	–	–	–	–

Source: DHET (2019e)

Notes:
1. Percentages represent the proportions of a given FTEN undergraduate three-year degree programmme cohort that successfully completed their studies within the specified number of years after commencement.

The data show that throughput rates appear to be rising with each new cohort. For example, 19.2 percent of the FTEN undergraduate cohort that enrolled at public universities in 2000 completed their degrees within the minimum time period, while this proportion increased to 22.9 percent for the cohort entering in 2012. In 2013, this proportion rose even further, to 26.6 percent. If an additional year is allowed for completing the three-year degree programme, the throughput rate is 33.9 percent for the 2000 entry cohort and 40.5 percent for the 2012 entry cohort.

Despite these signs of increased efficiency in public universities, it remains worrying that large numbers of students still take much longer than the specified three years to complete their undergraduate degrees. For example, only 55.8 percent of the cohort that entered public universities in 2010 had completed their undergraduate degrees after six years – twice the expected duration of a three-year degree. In other words, almost half of the 2010 FTEN cohort had not completed their three-year programmes within six years of enrolling at university. The extent of this problem is further illustrated when one considers the 2006 FTEN cohort, of whom only 57.1 percent completed their three-year degrees within 10 years of entering university; thus, 42.9 percent had still not completed their degrees 10 years after enrolling. The throughput rates in Figure 6.20 therefore show major inefficiencies in public universities. Given the relatively high cost of attending public universities, these slow throughput rates imply significant expenses for both the individual and the state.

The analysis presented in this section on HE points to a number of important conclusions regarding the role of the HE subsector in fostering the skills that are required in the labour market. First, access to HE has improved notably over the period 2011–2017, with almost 100 000 more individuals being enrolled at public universities in 2017 than was the case in 2011. This constitutes an average annual enrolment growth rate of 1.7 percent over the period. However, enrolments at universities will have to grow even faster – at an average rate of 3.5 percent per year between 2017 and 2030 – in order for the target of 1.6 million enrolments set out in the WPPSET to be met. Access to HE has also become more inclusive, with black Africans now making up the bulk of enrolments at universities. In terms of the goals set out in the NDP, it is encouraging that enrolment in SET programmes has grown the fastest over the period 2011–2017. This constitutes an important trend in terms of the NDP's call for more individuals to become qualified for jobs in innovation, science, and technology.

6.3.3. TVET and private colleges

TVET and private colleges constitute another key subsector of the PSET system. The NDP emphasises that TVET colleges should play a critical role in skills development, with the aim of reducing skills shortages and thereby also youth unemployment (DHET, 2019a). In 2017, there were 50 registered TVET colleges operating on 252 campuses (DHET, 2019b). Private colleges also form an important part of the PSET system: there were 268 private colleges registered with the DHET in 2017, meaning that there are more private colleges than TVET campuses (DHET, 2019b).

The TVET system was introduced to offer an alternative to academic education that is better suited to the needs of the workplace (van der Berg & Hofmeyr, 2018). TVET and private colleges provide an alternative to the university system for individuals who drop out of school before completing matric and for those with matric qualifications. They offer a number of qualification types, which include certificates, diplomas, and short courses. The qualification types that lead to a certificate are the National Certificate (Vocational) (NC(V)) and Report 191 N1–3 courses (Reddy et al., 2016). NC(V) Level 4 is equivalent to matric, while NC(V) 6 is a diploma qualification. Private colleges are somewhat more flexible than TVET colleges in terms of their course offerings and were recognised by the WPPSET (DHET,

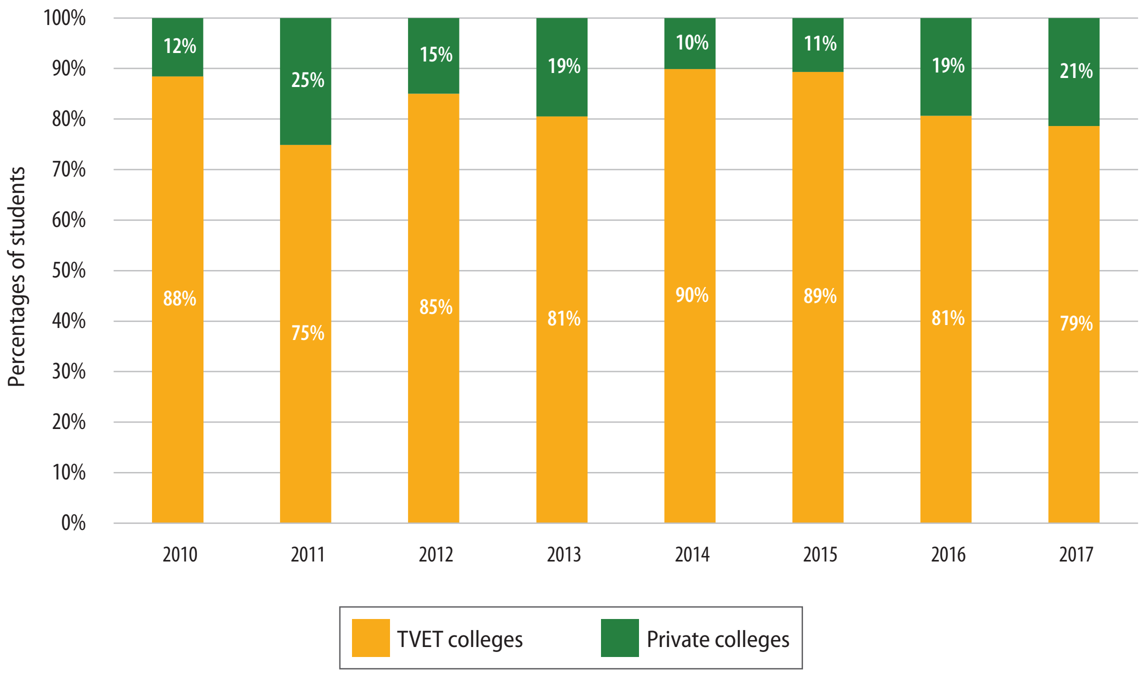
2013) as an important service provider for 'niche' areas that are often lacking in TVET colleges (DHET, 2019a). Unfortunately, though, analysis of the TVET and private college subsector has raised concerns around quality in some parts of this subsector (DHET, 2019a). For example, the Ministerial Committee tasked with evaluating the funding of TVET colleges expressed the following concern:

> [I]n recent years TVET college quality has been compromised because of the pressure to increase enrolments without compensatory increases in staff and other resources. Provision must therefore be made to ensure qualitative improvements to meet labour market needs, even if it has to be at the expense of further increasing quantitative growth in enrolment. Indeed, as the reviewed literature indicates, current certification rates are abysmal. Currently learners in the TVET system graduate at an exorbitant per capita cost which is unsustainable. Moreover, the absorption rate of TVET graduates in the economy is also a cause of serious concern. (DHET, 2017b, pp. 188–189).

The low absorption rate of TVET graduates in the economy is also highlighted in a World Bank (2019) report on South Africa's PSET system as a major cause for concern. Much work will need to be done to improve the quality of TVET qualifications if the DHET is to realise the potential of this subsector to play a crucial role in contributing to skills development, as envisioned in the WPPSET. This context must be kept in mind when reviewing the enrolment and graduation trends in TVET colleges presented in this section.

6.3.3.1. Access. Figure 6.21 shows the percentages of students enrolled at TVET and private colleges for the period 2010–2017. Despite there being more private colleges than TVET campuses, TVET students constitute the major share of enrolments in this subsector of the PSET system.

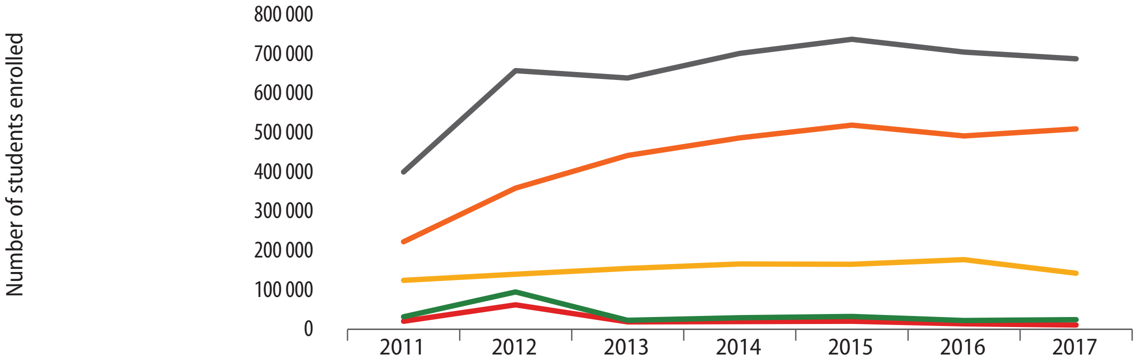
FIGURE 6.21: Percentage of students enrolled at TVET and private colleges, 2010–2017



Source: DHET (2019b)

As is the case in the university subsector, enrolments at TVET and private colleges increased significantly over the period 2011–2017. Growth in TVET enrolments was particularly impressive during this period, with enrolment increasing by 9.4 percent per year, from 400 273 to 688 028. Figure 6.22 shows that enrolment growth at TVET colleges was driven by enrolments in Report 191 (N1–6) programmes (certificates and diplomas), which increased by 129 percent over the period.

FIGURE 6.22: Enrolments at TVET colleges by qualification type, 2011–2017

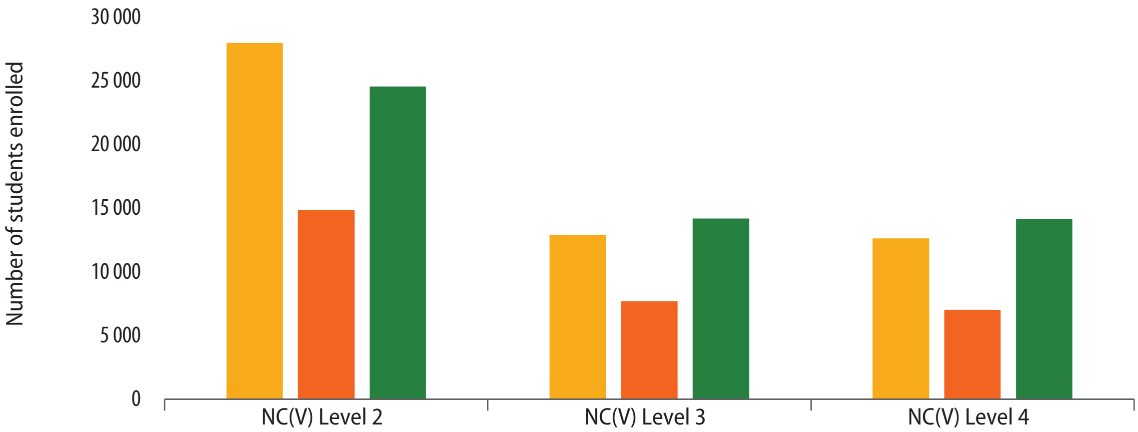


	2011	2012	2013	2014	2015	2016	2017
NC(V)	124 658	140 575	154 960	166 433	165 459	177 261	142 373
Report 191 (N1–6)	222 754	359 624	442 287	486 933	519 464	492 026	510 153
Occupational qualifications	20 799	62 359	19 000	19 825	20 533	13 642	10 969
Other	32 062	95 132	23 371	29 192	32 424	22 468	24 533
Total	400 273	657 690	639 618	702 383	737 880	705 397	688 028

Source: DHET (2019b)

NC(V) Level 2 programmes enrol the most students at TVET colleges relative to other NC(V) programmes, as is evident in Figure 6.23. The majority of NC(V) Level 2 students were enrolled in engineering programmes in 2017, followed by business programmes.

FIGURE 6.23: Enrolment rates at TVET colleges by qualification type, 2017

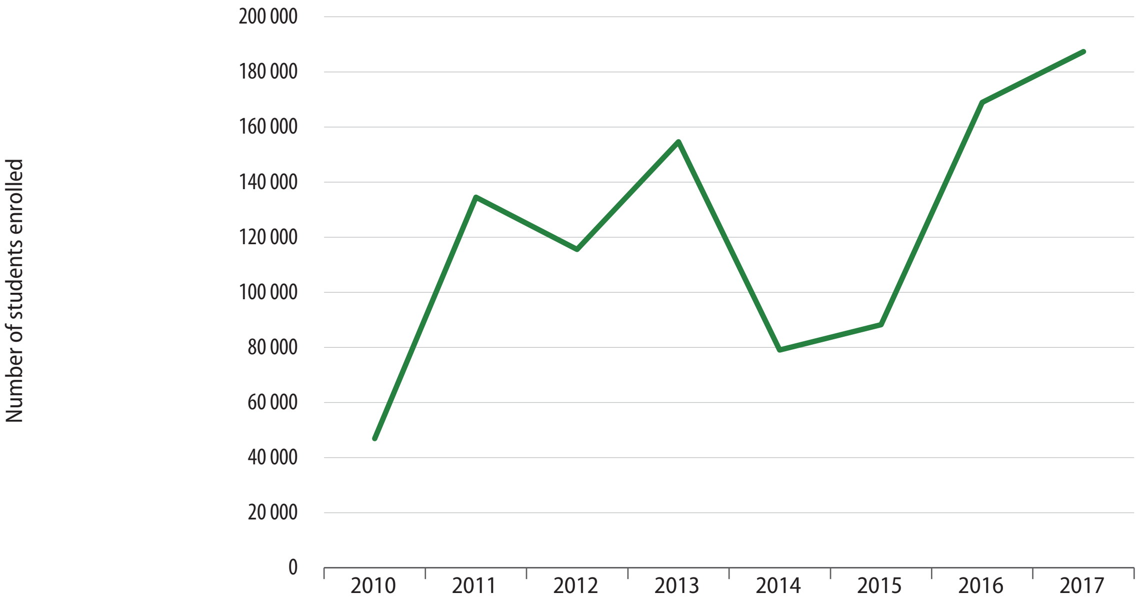


	NC(V) Level 2	NC(V) Level 3	NC(V) Level 4
Engineering	27 970	12 907	12 620
Services	14 834	7 707	7 022
Business	24 565	14 188	14 150

Source: Own calculations, DHET (2019b)

Figure 6.24 shows an erratic trend in private college enrolments over the period 2010–2017. The DHET (2019a, p. 79) explains that this trend may be partly due to erratic reporting by private colleges and "indicates a clear need for data improvement". Despite the erratic overall trend, enrolments at private colleges, like TVET enrolments, increased between 2010 and 2017, at an average annual rate of 21.9 percent.

FIGURE 6.24: Number of students enrolled at private colleges, 2010–2017



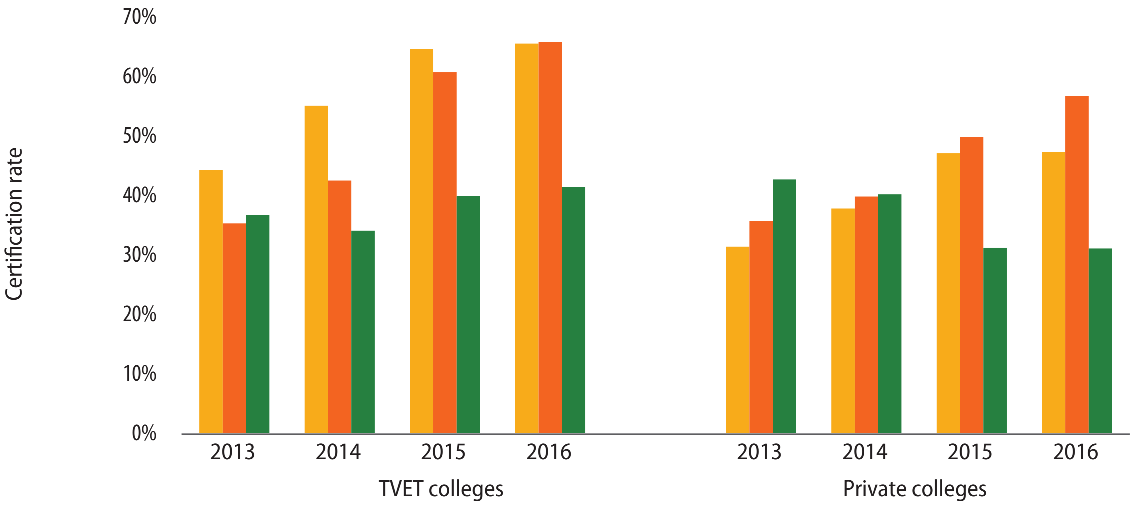
	2010	2011	2012	2013	2014	2015	2016	2017
Enrolment at private colleges	46 882	134 446	115 586	154 632	79 085	88203	168911	187354

Source: Own calculations, DHET (2019b)

6.3.3.2. Success. As mentioned in the introduction to this section on TVET and private colleges, there continue to be serious quality concerns surrounding these colleges. Much of the concern is centred on low completion rates. While around 90 percent of students enrolled in TVET programmes write examinations at the end of the year (Reddy et al., 2016), certification rates – especially in NC(V) Level 4 programmes – remain low. Figure 6.25 shows certification rates[17] in TVET and private colleges by qualification type for the period 2013–2016. In TVET colleges, certification rates for Report 191 N3 programmes increased at an average rate of 13.6 percent per year over this period, while Report 191 N6 certification rates almost doubled, from 35.6 percent in 2013 to 66.1 percent in 2016. The picture looks similar in private colleges, with certification rates for Report 191 N6 programmes growing at an average annual rate of 14.5 percent, and certification rates for Report 191 N3 programmes growing at an average rate of 16.6 percent per year. These improvements in certification rates in Report 191 N3 and N6 programmes are encouraging. However, fully leveraging the potential of the college system to improve the skills of the labour force requires paying further attention to improving completion rates. This is especially pressing for students enrolled in NC(V) Level 4 programmes, whose certification rates improved only marginally between 2013 and 2016 at TVET colleges and declined in private colleges from 43 percent in 2013 to 31.4 percent in 2016.

17 The certification rate is defined as the percentage of students who passed their examinations as a proportion of the total number of students who sat for the examination.

FIGURE 6.25: Certification rates by qualification type at TVET and private colleges, 2013–2016



	TVET 2013	TVET 2014	TVET 2015	TVET 2016	Private 2013	Private 2014	Private 2015	Private 2016
Report 191 N3	44,6	55,4	64,9	65,8	31,7	38,1	47,4	47,6
Report 191 N6	35,6	42,8	61	66,1	36	40,1	50,1	57
NC(V) Level 4	37	34,4	40,2	41,7	43	40,5	31,5	31,4

Source: DHET (2019a)

6.3.3.3. Equity. As is the case in both the public and the private university subsectors, black African students made up the bulk of the share of enrolments in TVET colleges (92 percent) in 2017 (Table 6.2). White students made up a particularly small share of TVET enrolments in 2017 (1 percent). In private colleges, black African students again constituted the bulk of enrolments, accounting for 85.2 percent of enrolments in 2017.

TABLE 6.2: Enrolments at TVET colleges by population group, 2017

QUALIFICATION CATEGORY	BLACK AFRICAN	COLOURED	INDIAN/ ASIAN	WHITE	UNSPECIFIED
NC(V)	136 146	5 673	149	379	26
Report 191 (N1–6)	476 271	27 176	1 413	5 195	98
Occupational qualifications	5 762	4 893	14	300	0
Other	17 538	5 898	123	952	22
Total public colleges	**635 717**	**43 640**	**1 699**	**6 826**	**146**
Total private colleges	**94 992**	**4 849**	**3 610**	**8 013**	

Source: DHET (2019b); own calculations, DHET (2019a)

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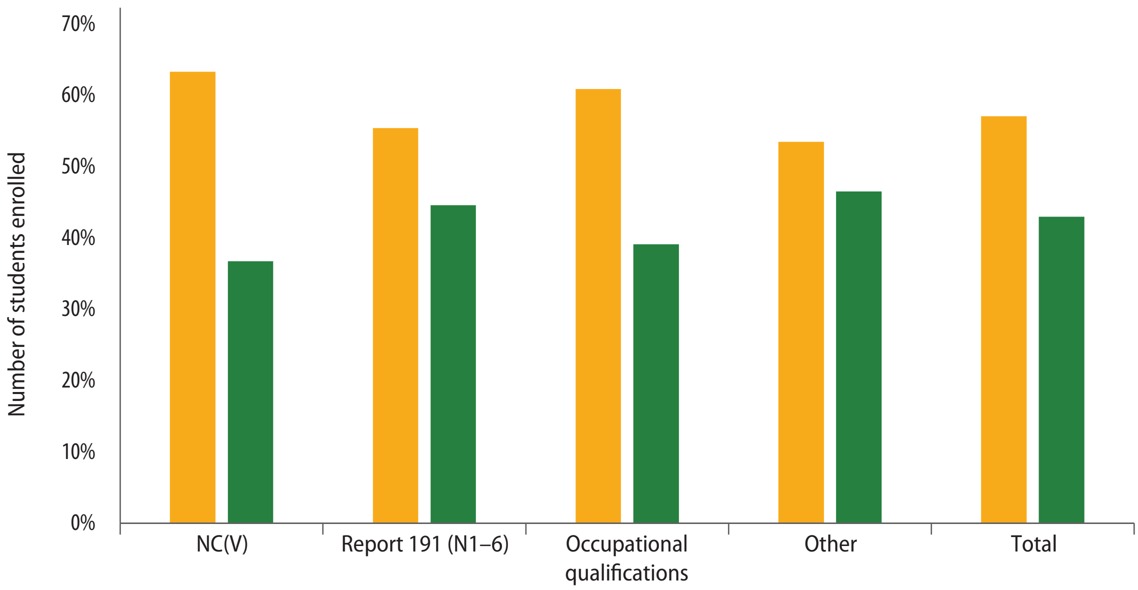
As is the case in universities, women outnumbered men in all TVET programmes, with gender ratios especially favouring women in NC(V) and occupational qualifications (Figure 6.26).

FIGURE 6.26: Enrolments at TVET colleges by gender, 2017

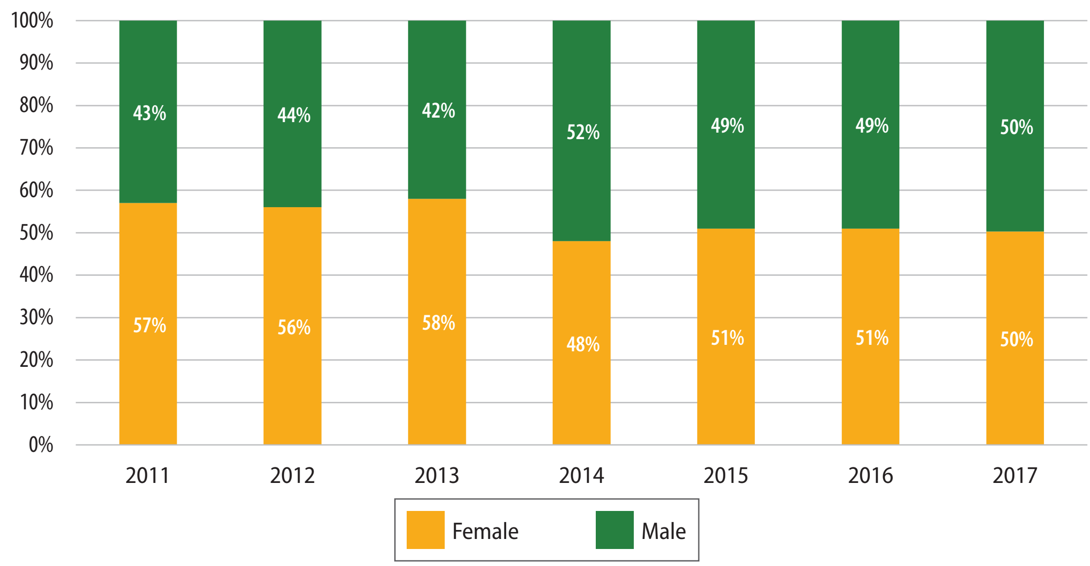


	NC(V)	Report 191 (N1–6)	Occupational qualifications	Other	Total
Female	63%	55%	61%	53%	57%
Male	37%	45%	39%	47%	43%

Source: DHET (2019b)

Figure 6.27 shows that the gender distribution of enrolments was more equal in private colleges, with women making up between 48 percent and 58 percent of enrolments over the period 2011–2017.

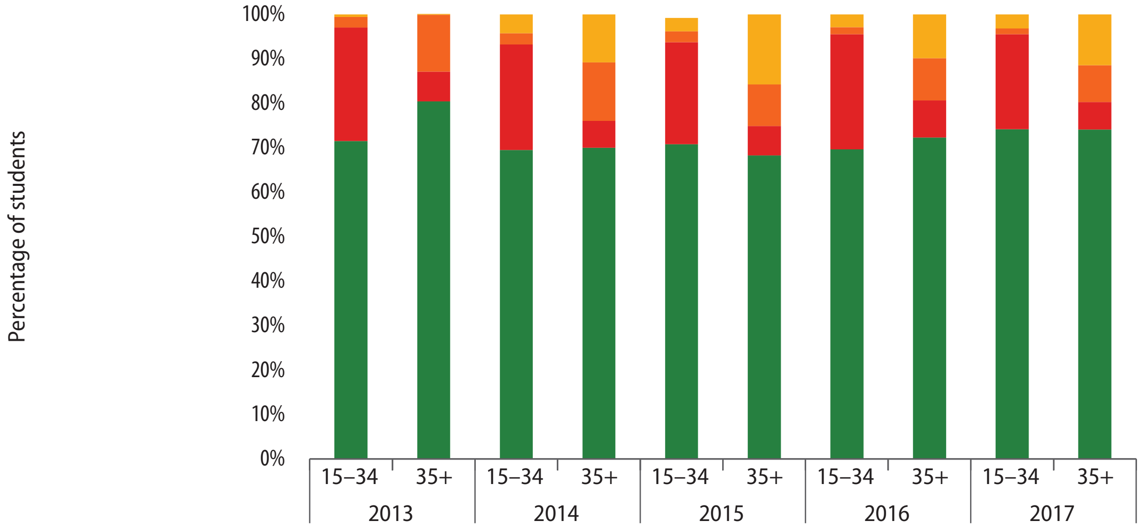
FIGURE 6.27: Enrolments at private colleges by gender, 2011–2017



Source: DHET (2019a, 2019b)

Figure 6.28 shows that, for the period 2013–2017, younger TVET students were more likely to enrol in NC(V) programmes than their older counterparts. By contrast, there were relatively more older TVET students in occupational qualification programmes categorised as "other" than there were in other occupational categories.

FIGURE 6.28: Percentages of TVET students in different age groups, 2013–2017



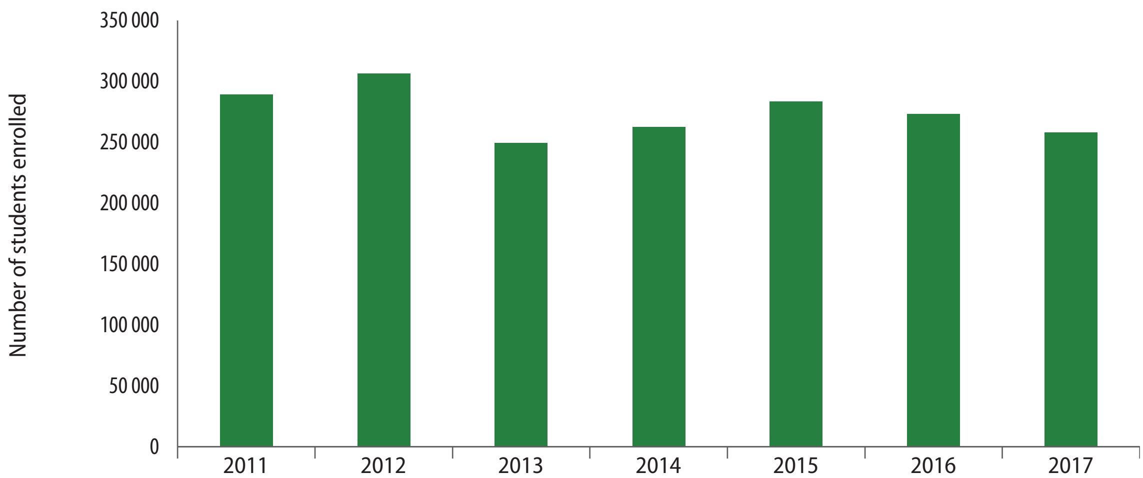
	2013 15–34	2013 35+	2014 15–34	2014 35+	2015 15–34	2015 35+	2016 15–34	2016 35+	2017 15–34	2017 35+
Other	1%	0%	4%	11&	3%	16%	3%	10%	3%	11%
Occupational qualifications	2%	13%	3%	13%	3%	9%	2%	10%	1%	8%
NC(V)	26%	7%	24%	6%	23%	7%	26%	8%	21%	6%
Report 191 (N1–6)	72%	80%	70%	70%	71%	68%	70%	72%	74%	74%

Source: DHET (2019b)

6.3.4. CET colleges

CET colleges are a new type of institution designed to cater for youths and adults who did not complete their schooling or who never attended school and thus do not qualify to study at colleges and universities. In 2017, there were nine CET colleges, one in each province. Figure 6.29 shows enrolment at CET colleges for the period 2011–2017 and illustrates that CET enrolment declined slightly over this period, at an average rate of 1.9 percent per year. The DHET (2019b) ascribes this decline in enrolment to CET students becoming younger and to programme offerings being largely non-responsive to the demands of younger cohorts. There were 258 199 students enrolled at CET colleges in 2017.

FIGURE 6.29: Number of students enrolled at CET colleges, 2011–2017



	2011	2012	2013	2014	2015	2016	2017
Total	289 363	306 378	249 507	262 680	283 602	273 431	258 199

Source: DHET (2019b)

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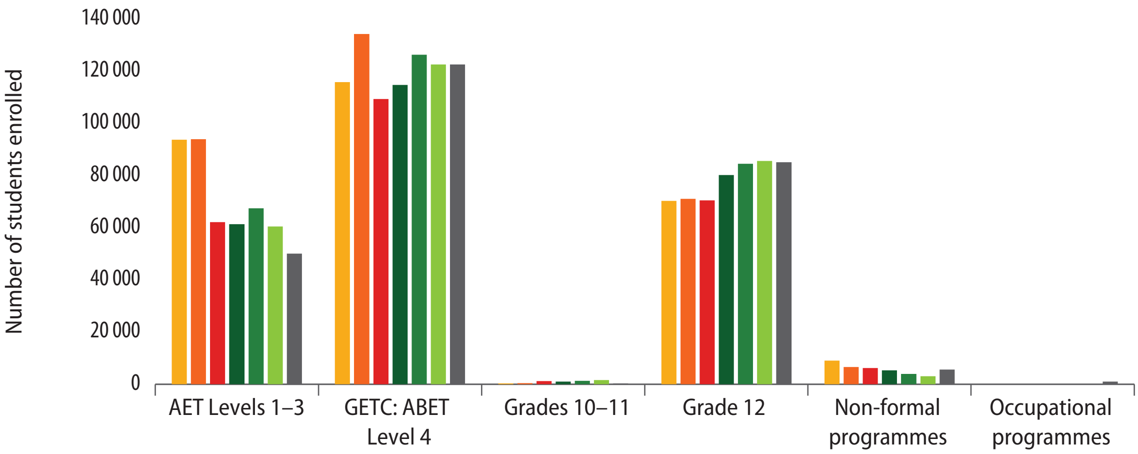
One major change occurring in the CET subsector is an increase in enrolments in Grade 12, which have grown at an average rate of 3.3 percent per year (Figure 6.30). Despite this growth, enrolments in General Education and Training Certificate: Adult Basic Education and Training (GETC: ABET) Level 4 programmes continue to dominate CET enrolments, accounting for 46 percent of the total in 2017.

FIGURE 6.30: Number of students in CET colleges by programme, 2011–2017



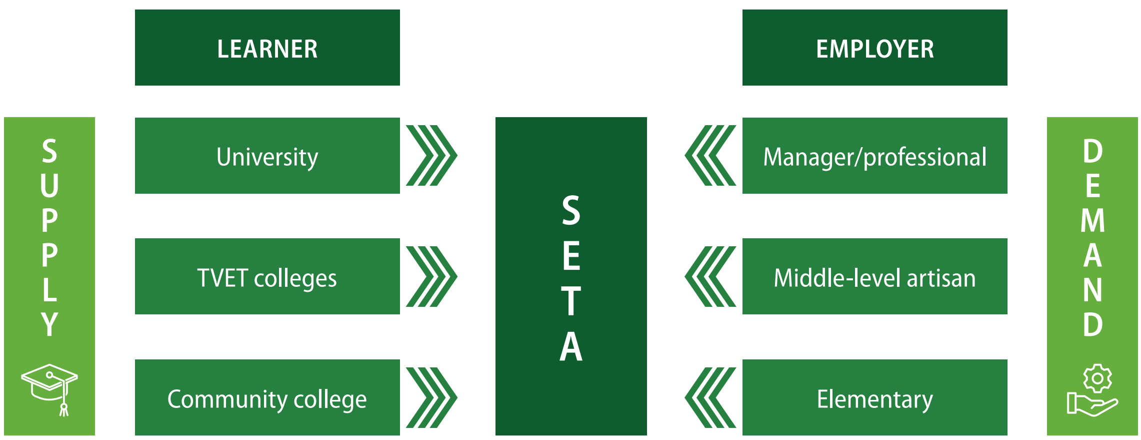
	AET Levels 1–3	GETC: ABET Level 4	Grades 10–11	Grade 12	Non-formal programmes	Occupational programmes
2011	93 784	115 858	356	70 262	9 103	0
2012	93 936	134 276	471	71 037	6 658	0
2013	62 183	109 352	1 172	70 536	6 264	0
2014	61 355	114 780	1 031	80 214	5 300	0
2015	67 468	126 307	1 294	84 526	4 007	0
2016	60 448	122 619	1 633	85 625	3 106	0
2017	50 072	122 619	376	85 148	5 672	1 018

Source: DHET (2019b)

6.3.5. Workplace-based learning

Recognising the need to improve the knowledge and skill set of the labour market, the South African Parliament ratified the Skills Development Act in 1998, which defined a new Sector Education and Training Authority (SETA) system. In essence, SETAs function as the intermediaries between education (theoretical learning) and the workplace (practical learning), as shown in Figure 6.32. SETAs are responsible for developing a series of sector-specific skills plans within the clearly defined framework of the National Skills Development Strategy.

FIGURE 6.32: The role of SETAs in the PSET system



Source: DHET (2019c)

With the number of unemployed individuals in South Africa reaching 6.7 million in the second quarter of 2019, and with 8.2 million youth (aged 15–34) who are not in employment, education, or training (NEET) (QLFS, Stats SA, 2019), there are millions of people throughout the country who need to learn new skills. Furthermore, even individuals who are employed need to continue learning new skills and adapt to a changing work environment.

As of 2020, there are 21 SETAs in South Africa, each responsible for a particular sector and each with its own set of scarce and critical skills. For example, one SETA is responsible for education and training in the insurance industry (INSETA), while another SETA deals with education and training in the transport sector (TETA). All 21 SETAs are responsible for both private and public training within their specific sector. It is important to note that these 21 SETAs are not explicit skills providers. SETAs collect data on workplace skills needs in their respective sector, identify skills in demand, and assist workers and unemployed individuals with skills development interventions, which take the form of learnerships, internships, skills development programmes, and bursaries. Thus, each SETA is responsible for addressing skills needs in its respective sector through these skills development interventions.

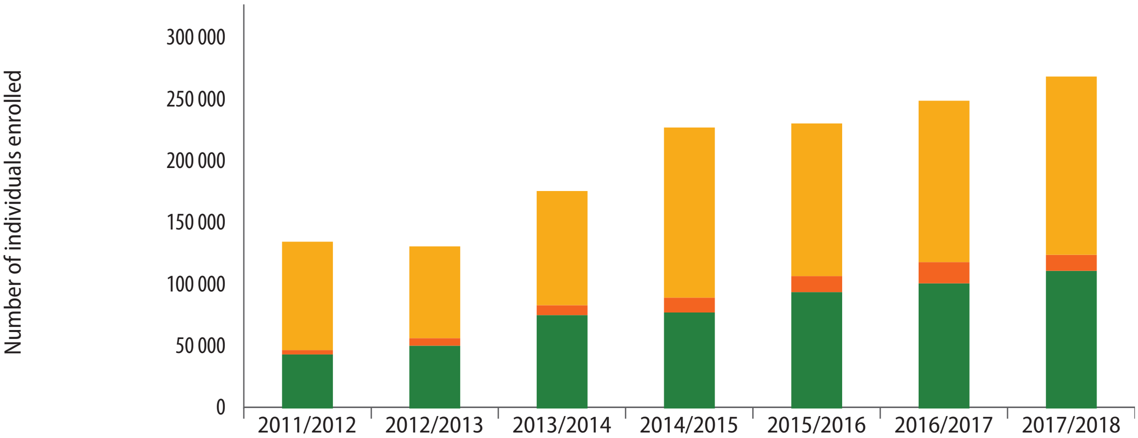
SETAs collect data on workplace skills needs in their respective economic sectors from annual Workplace Skills Planning (WSP) and Annual Training Report (ATR) submissions from employers, focus groups, and consultation processes. Each sector-specific SETA uses this data to annually produce a Professional, Vocational, Technical, and Academic Learning (PIVOTAL) skills list – essentially a list of 10 occupations in demand, based on the Organising Framework of Occupations (OFO) classification system. Thereafter, SETAs direct planning and funding to producing individuals in their respective sectors who possess these PIVOTAL skills. Following the SETAs' publication of their top 10 skills in demand, the DHET compiles a list of the national top 100 skills in demand every two years. Hence, this is a process of aggregation, with employers providing employment and training trends in their sector, SETAs producing a list of skills demands for their respective sector of the economy, and, finally, the DHET providing the national list of skills demand.

SETAs work towards meeting the skills in demand by means of skills development interventions. Skills development interventions are simply defined as vehicles for obtaining a qualification, where a qualification is a formal recognition of achievement of the required number and range of credits at specific levels of the NQF. The learnerships, internships, and skills development programmes offered by SETAs can be defined as follows:

- Learnerships must lead to a qualification registered on the NQF. Learnerships include this qualification as well as work experience, where an employer is contracted and provides work experience to enrolled participants.
- SETAs also offer artisanal learning programmes undertaken at the workplace in preparation for an occupation that is on the official list of artisan occupations. Hence, artisan learning programmes are similar to learnerships, except for the fact that artisanal learning programmes are registered against a listed trade.
- Internships are mainly graduate programmes, as they occur after a qualification has been achieved. Internships do not need to include training, but it is preferred that training be incorporated.
- Skills programmes are usually offered by employers and/or skills development providers as part of upskilling or reskilling. SETAs assist both employed (i.e., in cases where employers send employed workers for further training) and unemployed individuals through their skills development interventions. However, most SETA skills development interventions require a matric qualification. This is in contrast to TVETs, which offer an alternative path for individuals who have left the schooling system.

Figure 6.32 shows the number of individuals who registered for and successfully completed skills development programmes facilitated by the SETAs for the period 2011/2012–2017/2018. Total registrations for these programmes nearly doubled over the period, with much of this growth being driven by growth in learnership enrolments, which increased by 155 percent. Although the number of individuals who registered for internships was small, the number grew dramatically over the period, with almost four times as many individuals registered for internships in 2017/2018 as in 2011/2012.

FIGURE 6.32: Enrolments in skills development programmes by programme type, 2011/2012–2017/2018

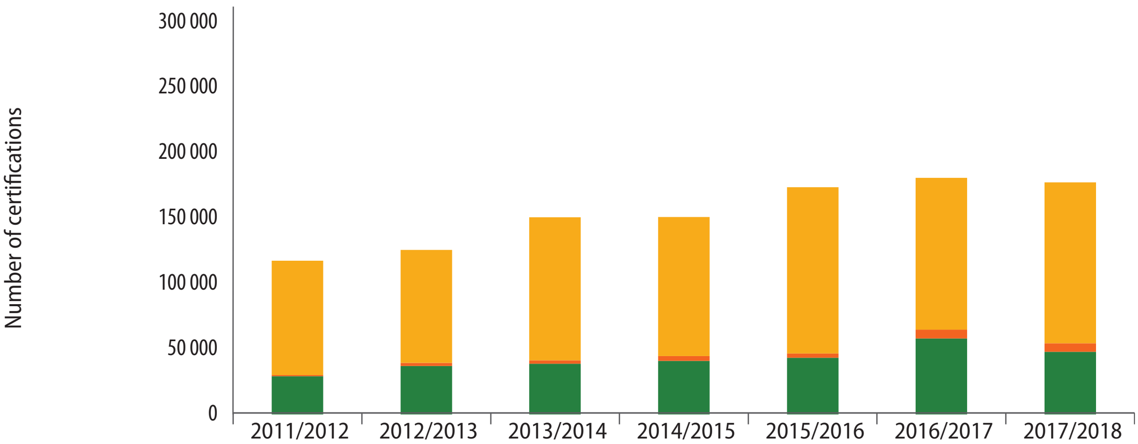


	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Skills programmes	87 906	74 587	92 508	137 880	123 593	131 017	144 531
Internships	3 452	6 127	8 017	12 006	13 135	17 216	12 935
Learnerships	43 871	50 885	75 782	77 931	94 369	101 447	111 681

Source: DHET (2019b)

Certification in skills development programmes also improved over the period 2011/2012–2017/2018. The largest improvements over the period were in internships, where average annual certification rates grew by 39.6 percent. Certification rates in learnerships and skills programmes grew by 8.6 percent and 5.1 percent on average per year, respectively (Figure 6.33).

FIGURE 6.33: Certifications in skills development programmes by programme type, 2011/2012–2017/2018

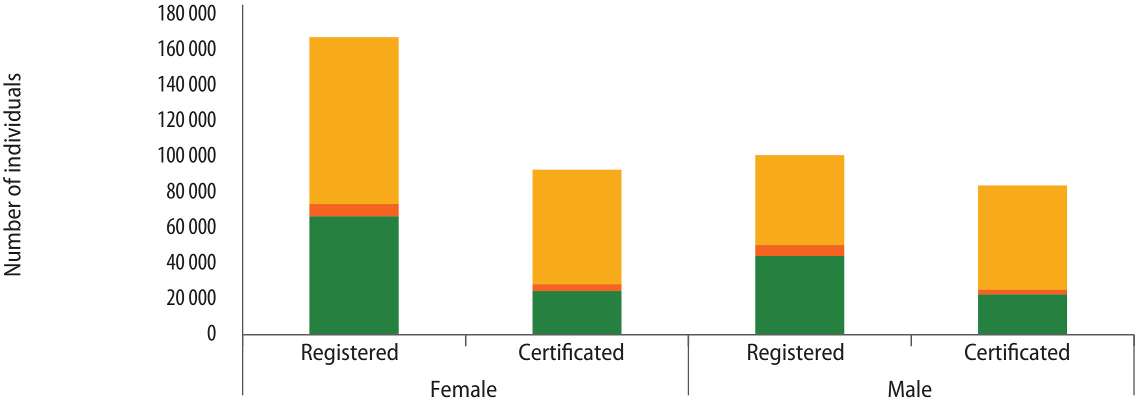


	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Skills programmes	87 527	86 491	109 547	106 459	127 144	116 141	122 979
Internships	878	2 195	2 510	3 663	3 352	6 777	6 496
Learnerships	29 197	37 158	38 796	40 891	43 322	58 080	48 002

Source: DHET (2019b)

Figure 6.34 shows registrations and certifications in skills development programmes by gender. The gender gap in favour of women in registrations is striking, especially in skills programmes. There are almost twice as many women registered in skills programmes as men. However, the figure also shows that far fewer women received certificates from SETA-supported programmes relative to the number of women registered for these programmes. This raises concerns around inefficiencies in the SETA system, although it is not clear why these inefficiencies are so pronounced for women. This issue will need to be addressed, though, if the country is to leverage the full potential of SETAs to contribute to skills development.

FIGURE 6.34: Registrations and certifications in skills development programmes by gender, 2017/2018



	Female Registered	Female Certificated	Male Registered	Male Certificated
Skills programmes	93 945	64 376	50 586	58 603
Internships	6 833	3 855	6 102	2 641
Learnerships	67 008	24 951	44 673	23 051

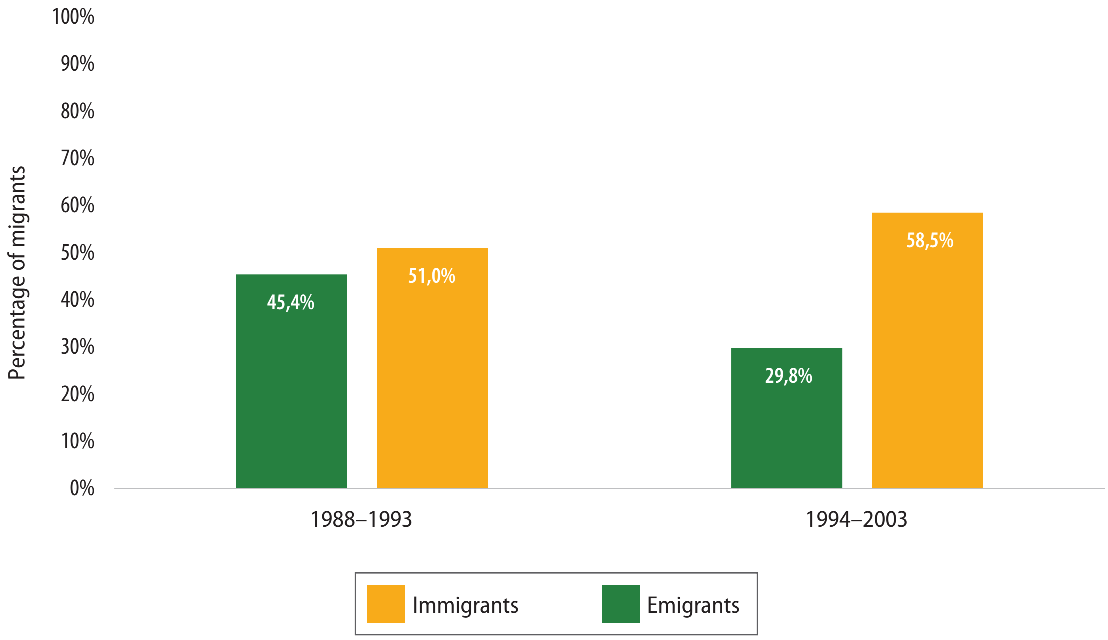
Source: DHET (2019b)

6.4. Migration and the supply of skills

Migration occurs when individuals change their geographical location, either temporarily or for a long period of time. Among the decisive factors for South Africans leaving the country are slow economic growth, a persistently high and growing rate of unemployment (particularly for youth, aged 15–34), high levels of poverty and inequality, relatively high levels of personal income and company tax rates, crime, political uncertainty, and poor infrastructure (van Rooyen, 2000; Rasool et al., 2012). Skilled South Africans are more likely to emigrate with fewer labour market frictions and have better opportunities for higher paying jobs abroad, given their increased level of educational attainment relative to South Africans with a limited skill set. The process of skilled human capital leaving a country is commonly referred to as 'brain drain'. On the other hand, while it is not the most popular immigration destination globally, South Africa is a highly favoured destination country for migrants from other African countries as it is one of the most developed countries on the continent.

Statistics South Africa's (Stats SA's) 1988–2003 Documented Migration data provide historical trends on the employment status and broad occupation category of both immigrants and emigrants. Figure 6.35 shows that the percentage of emigrants who were economically active at the time of leaving South Africa was higher (1988–1993: 51.0 percent; 1994–2003: 58.4 percent) than the corresponding percentage for immigrants (1988–1993: 45.4 percent; 1994–2003: 29.8 percent). Unfortunately, the Documented Migration dataset has been discontinued since 2003 and presents a limitation for further empirical analysis.

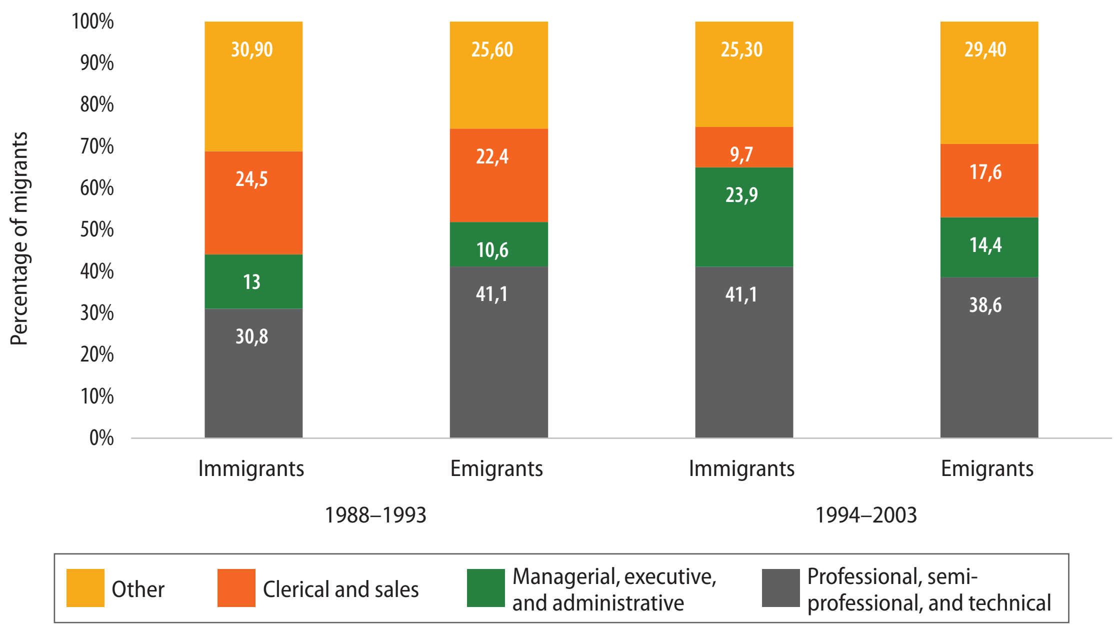
FIGURE 6.35: Proportion of migrants who were economically active, 1988–2003



Source: Stats SA (2004)

Figure 6.36 shows the skills levels of economically active migrants. Between 1988 and 1993, just before the political transition to democracy, a relatively large share of emigrants (41.4 percent) were involved in high-skilled professional, semi-professional, and technical occupations compared to immigrants (30.8 percent). Between 1994 and 2003, the share of high-skilled occupations was slightly higher for immigrants (41.1 percent) than for emigrants (38.6 percent). These findings suggest that brain drain likely took place in the South African labour market and has had an impact on skills supply and demand in South Africa. At the time of writing, a detailed study on migration that aims to make use of more recent data is being conducted as a component of the Labour Market Intelligence Programme (LMIP), with a view to providing insights on the impact of migration on the supply of skills in South Africa.

FIGURE 6.36: Skills levels of economically active migrants, 1988–2003



Source: Stats SA (2004)

6.5. Key challenges surrounding skills supply

The evidence presented in this chapter shows that there has been remarkable progress in the PSET system towards the goals outlined in the NDP. The most notable gains have been in the expansion of access, especially to previously disadvantaged groups. However, key challenges in the PSET sector remain. This section outlines the main challenges faced by the DHET in terms of meeting the country's skills development needs.

A major obstacle to increasing South Africa's supply of skills has been the country's slow economic growth in 2018 and 2019, which is forecasted to continue in the medium term (World Bank, 2019). The gains in terms of access presented earlier in this chapter occurred during a period of high economic growth, and the continued expansion of the PSET system will have to occur in a much more constrained fiscal environment. Government's introduction of free HE for students with household incomes below R350 000 per year will be especially difficult to sustain in the current fiscal environment. This investment will only be fiscally sustainable if it translates into real improvements in the knowledge and skills that graduates bring to the labour market and in so doing accelerates economic growth. In other words, expanding access to PSET opportunities to students who were previously excluded will only pay off if PSET institutions provide quality education and training programmes that adequately prepare students for entry into the labour market.

An additional challenge surrounding skills development is the country's high rate of unemployment, especially among youth, with the majority of new entrants into the labour market who are unemployed ranging between 15 and 34 in age. Young NEETs in particular pose a potential barrier to the achievement of the vision set out in the NSDP of an educated, skilled, and capable workforce for South Africa.

In Q2 2019, there were 8.2 million NEETs between the ages of 15 and 34, up from 7.5 million in Q2 2013.[18] Relative to other BRICS countries, South Africa has the highest proportion of NEETs between the ages of 15 and 24, at 32.6 percent. The NEET rate for those aged 25–34 was even higher than for those aged 15–24, at 48.5 percent. In Q2 2019, the NEET rate was highest for individuals with primary or lower education (55.3 percent) and those with incomplete secondary schooling (43.2 percent). These individuals are of particular concern: they remain disconnected from the country's formal economy because they are low-skilled, not engaged in employment, and not developing their skills to improve their employment prospects. NEETs are also particularly vulnerable to the various social pathologies that characterise many of South Africa's neighbourhoods and that manifest in the country's comparatively high levels of crime (DHET, 2019a).

The high numbers of unemployed people and NEETs are symptomatic of the imbalances that exist between the demand for and the supply of skills, and they suggest an important role for the CET subsector in particular. CET colleges are intended to cater mainly for youths and adults who did not complete their schooling and therefore do not qualify to study at HEIs. CET colleges are increasingly becoming institutions that offer NEETs "second-chance" opportunities to improve their labour market prospects. For those with lower levels of schooling, the PSET system can play a role in enabling the attainment of basic skills through qualifications such as the GETC: ABET.

18 A detailed profile of South African NEETs can be found in Chapter 3 of this report.

6.6. Conclusions and implications for skills planning

The analysis presented in this chapter has pointed to encouraging trends in terms of skills supply for South Africa. The PSET system has changed substantially since the political transition, through new legislation, new institutions, and the restructuring of old institutions, as well as new governance and funding arrangements within institutions whose purpose has been to expand access to the PSET sector. Although access will have to increase further to reach the targets set out in the WPPSET, there have been substantial improvements in access and throughput rates in recent years. In addition, much has been achieved in terms of equity, with previously disadvantaged population groups now constituting more than 85 percent of enrolments in all PSET institutions.

These trends point to a larger pool of skilled persons currently entering the labour market than has historically been the case. The analysis in this chapter has shown that the number of individuals entering the labour market with tertiary qualifications is increasing rapidly, which can be expected to raise the productivity of the country's workforce and thus accelerate economic growth. Increased enrolment and throughput rates for SET qualifications in particular can be expected to contribute significantly to economic growth, given the importance of these skills in a modern economy. Substantial growth in the number of advanced (master's and doctoral) degrees being attained is also encouraging, as these qualifications yield high labour market and productivity returns.

The analysis has also pointed to key areas that require attention if the PSET sector is to realise its goal of fostering the skills required in the labour market. Most importantly, the potential of the PSET system to foster these skills is constrained by outcomes in the country's schooling system. While remarkable gains have been made in basic education over the period 2015–2019, high dropout rates remain a major constraint to the realisation of the NDP's skills development goals. Without further improvements in schooling outcomes, there will continue to be a limited pool of potential students eligible for PSET. This, in turn, places limits on the potential supply of skills in the labour market. President Ramaphosa's emphasis on improving reading in the foundation phase constitutes an important first step in improving schooling outcomes for all learners. Realising the skills development goals set out in the NDP will require a continued commitment to ensuring that all learners can read with meaning by the end of Grade 4.

Lowering the cost of PSET is of paramount importance if the DHET is to reach the enrolment targets articulated in the WPPSET. The White Paper proposes the expansion of distance education as a way to both lower average costs and meet enrolment targets. Indeed, technological developments have made it possible to design educational programmes that meet the needs of students as well as the demands of the country (DHET, 2013). Naturally, UNISA will play an important role in expanding distance education, given its position as the largest distance learning institution in South Africa. However, the White Paper emphasises that institutions that have traditionally offered only contact programmes – including universities and TVET colleges – will have to expand their distance programme offerings if the country is to meet the enrolment goals articulated in the NSDP. Expanding enrolment through distance programmes will not be enough, however, since distance education has historically been associated with low throughput rates in South Africa. Slow progression and high dropout rates in distance education will need to receive attention in order for this policy mechanism to meaningfully impact on skills provision.

PART 7

Skills imbalances

The identification of skills imbalances is critical in providing the DHET (and other relevant authorities) with a basis for the design and implementation of appropriate interventions. Indications of imbalance between demand and supply should translate into effective interventions that improve and adjust education and training in the country and, consequently, allow the skills requirements of the economy to be met. Understanding skills imbalances is essential for guiding the decisions made by government, employers, and individuals with respect to current skills acquisition and the skills needs of the future.[19] Three types of imbalances are considered in this chapter:

1. **Skills shortages.** These arise when skills demand exceeds skills supply. They may manifest as an inadequate number of workers in high-demand occupations. Signals of shortages typically include indicators related to changes in employment numbers, wages, and hard-to-fill vacancies. When related to occupations, these shortages can be referred to more precisely as 'occupational shortages'. Skills shortages may also be measured as deficiencies in the competencies associated with occupational shortages. It is, however, more difficult to calculate skills shortages with reference to skills competencies than with reference to occupations.
2. **Skills surpluses.** These occur when skills supply exceeds skills demand. They are characterised by a relatively high supply of but low demand for a given skill. Signals of surpluses include unemployment among individuals with a particular level of educational attainment or qualification.
3. **Skills mismatches.** These refer to the inadequacy of workers' skills relative to the requirements of the jobs they are currently in or to a situation in which workers' skills exceed those required for their jobs. Mismatches can be measured relative to qualification level, field of study, or competencies. When measured in relation to competencies, mismatches are often referred to as 'skills gaps'. In this report, mismatches related to qualification levels, field of study, and competencies will be considered. The following mismatches will be considered in particular:
    a. **Qualification mismatches.** These occur when workers have an educational level that is not in line with that required by their jobs.
    b. **Field-of-study mismatches.** These occur when workers are employed in a field that is different from what they studied and are qualified in.

This chapter first presents the Organisation for Economic Co-operation and Development's (OECD's) estimates of occupational shortages (and the skills shortages associated with these occupational shortages) in South Africa. It then proceeds to provide a discussion of unemployed graduates in South Africa, as this cohort may serve as an indicator of skills that are in surplus in the country (relative to the current level of demand). Finally, the chapter considers different indicators of mismatch. This consideration includes a brief discussion of the OECD's estimates of qualification and field-of-study mismatch and a review of the sectoral and occupational profiles of individuals employed with higher education (HE) and technical and vocational education and training (TVET) qualifications, in order to provide signals of possible mismatch among individuals who have attained qualifications through the PSET system.

19 Ideally, this understanding should be of predicted skills demand and predicted skills supply, and thus predicted skills imbalances, so that interventions can be undertaken today to reduce the imbalances that may be expected in the future (in the absence of intervention). It must be noted that the analysis provided is restricted in that it must make use of current and historical data to inform perceptions of and predictions for the future.

7.1. Skills shortages and surpluses

7.1.1. Occupational shortages and surpluses

The OECD combines accepted skills proxies with other labour force characteristics to obtain a comprehensive measure of skills gaps, which takes the form of a 'skills needs indicator' that indicates shortages and surpluses in occupations (OECD, 2017).

The OECD's occupational shortage index is constructed making use of weighted measures of change in:

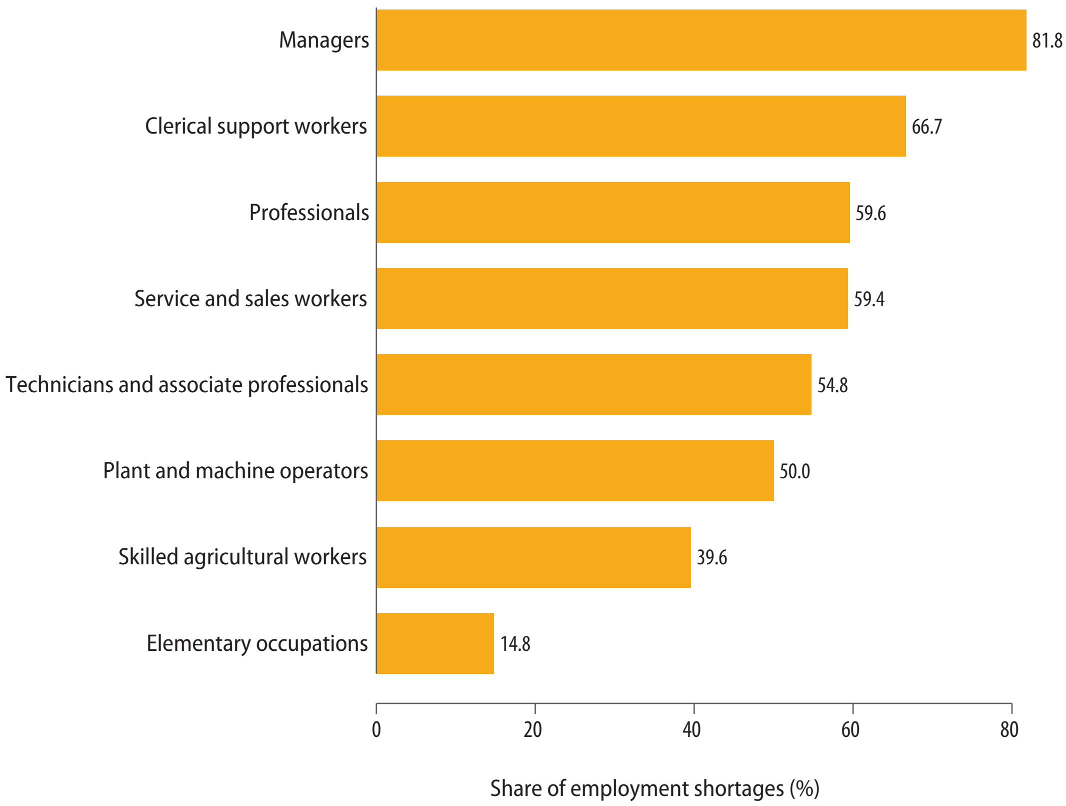
- Wage pressure, as proxied by hourly wage;
- Employment pressure, represented by total employment, unemployment rate, and hours worked; and
- Talent pressure, determined by underqualification growth, as measured by the number of individuals with educational levels below the modal level for all workers employed in that occupation. (OECD, 2017)

The OECD then applies a Hodrick-Prescott (HP) filter to each of the five variables at the occupation and economy-wide level. The HP filter is used to separate each variable's short-term and cyclical component from its long-term trend (OECD, 2017). The long-term trend for each variable and occupation is compared to the long-term trend of the economy. The difference in growth rates between the two provides information on the existence and extent of a labour shortage (or surplus) for each occupation–variable combination considered (OECD, 2017). This process is repeated for each variable and the results are then aggregated into a composite measure of occupational shortage.

The aggregation of each variable requires each variable to be standardised. To do this, each variable is divided by its weighted standard deviation for each year (OECD, 2017). The composite indicator represents a weighted average of the five variables. The values for the index vary from -1 (surplus) to +1 (shortage), with 0 being the 'centre' (indicating neither a shortage nor a surplus for a specific occupation). The numbers obtained are a relative measure: the variables' long-term trend is compared to the economy's long-term trend.

Figure 7.1 shows one-digit occupational-level shortages for South Africa, obtained by aggregating data for individual occupations from the OECD Skills for Jobs Database. For each individual occupation, the OECD calculated whether there was a shortage or surplus. Associated with each individual occupation was the occupational code, which allowed occupations to be grouped into the eight different categories shown below. Figure 7.1 shows the share of occupational shortages in each occupational group.

FIGURE 7.1: Share of employment shortages (%) per occupational group, 2016



Source: Own calculations, OECD Skills for Jobs Database (2019b)

Shortages exist in the large majority – 81.8 percent – of managerial occupations. This figure is well ahead of any occupational group and is indicative of the shortage of highly skilled personnel in South Africa. Other occupational groups in which the proportion of shortages exceed 50 percent are professionals (59.6 percent), technicians and associate professionals (54.8 percent), clerical support workers (66.7 percent), and service and sales workers (59.4 percent). The occupational group with the lowest proportion of shortages is elementary occupations. This is to be expected, as this is where the large majority of low-skilled workers are employed, and South Africa has an excess of low-skilled workers.

Figure 7.2 shows the average intensity of shortages and surpluses across all occupations in a particular occupational group.[20] The intensity scores are normalised between -1 (surplus) and +1 (shortage), with a score closer to +1 or -1 indicating a greater shortage or surplus.

20 Shortage intensity is calculated as the average of all occupations considered to have a high degree of shortages in each occupational group. Likewise, surplus intensity is calculated as the average of all occupations considered to be in surplus in each group.

FIGURE 7.2: Intensity of shortages and surpluses per occupational group, 2016

Source: Own calculations, OECD Skills for Jobs Database (2019b)

The greatest shortage intensity is within the technicians and associate professionals group, which has a score of 0.56. All other groups have scores of between 0.41 and 0.49, with the exception of the service and sales workers group, which has a shortage intensity score of 0.29. Broadly speaking, where shortages exist, these shortages are severe (with the exception of service and sales workers).

Interestingly, the managerial occupational class has the greatest surplus intensity among those occupations that are in surplus (-0.46). This is followed by elementary occupations (-0.36), professionals (-0.35), and skilled agricultural workers (-0.34). Broadly speaking, within each occupational group, the intensity of occupations in surplus is less than the intensity of occupational shortages.

Hard-to-fill vacancies

A survey focusing on hard-to-fill vacancies and skills gaps was undertaken by South Africa's Sector Education and Training Authorities (SETAs) in 2019. In the study, 'hard-to-fill vacancies' refer to occupations within an organisation that take longer than six months to fill with a suitably experienced and qualified candidate. The study was based on qualitative research – specifically, interviews conducted with key informants on skills needs issues. Twenty-one SETAs were requested to interview key informants with knowledge of their respective industries and skills needs. A total of 355 companies (in both the private and the public sector) were interviewed. Of these, 118 were small, 66 were medium, and 171 were large. The interviews covered 107 industries across 21 SETAs and all nine provinces.

The interviewees identified a total of 275 occupations that were hard-to-fill vacancies. The occupations identified most frequently were the following:

HARD-TO-FILL VACANCY	FREQUENCY
Sales and marketing manager	12
Software developer/programmer	10
Psychologist	8
Lawyer/advocate/attorney/prosecutor	8
Accountant (financial/management/forensic)	8
Finance manager	7
Information and communications technology (ICT) systems analyst	7
Social worker (occupational/adoption/probation)	6
Production manager/planner/co-ordinator	5
Economist	5
Auditor (internal/forensic)	5
Compliance officer	5
Customer relationship manager	5
IT support technician	5
Actuary	4
Boiler maker	4
Debt collector	4
Sewing machinist	4
Database designer and administrator	4
Sales representative	3
Programme/project manager	3
Audio visual technician	3
Purchasing manager	3
Legal officer	3
Organisational risk manager	3
Chef	3
Procurement Specialist	3

The report highlights that, when one considers occupations identified more than once, the industry with the highest number of hard-to-fill vacancies is finance. IT, manufacturing, retail, and legal also have a considerable number of such vacancies. Lack of work experience, lack of relevant qualifications, and poor salary offering are cited as the strongest reasons for hard-to-fill vacancies. Lack of work experience is the most important such reason, followed by lack of relevant qualifications. This limitation, the report notes, reinforces the need for apprenticeships, learnerships, internships, and work-integrated learning.

7.1.2. Skills shortages and surpluses

To obtain a measure of the skills shortages associated with the occupational shortages across various sectors and in the economy as a whole – in terms of competencies, knowledge, or abilities – the OECD maps occupations to their skills competency content[21] using the O*NET database.[22]

O*NET provides a set of skills, abilities, and knowledge for a large variety of occupations. O*NET codes each variable or skill (e.g., reading comprehension) for each occupation along two dimensions: importance and level. The OECD took the product of these two dimensions to provide a measure of each skill associated with a specific occupation. The OECD standardised the scores through the "min/max" method, with skills scores ranging from 0 to 1, where a bigger value indicates greater skill intensity.

The score for each skill is multiplied by the extent of the shortage for each occupation (calculated earlier), in order to obtain the final skills shortage indicator. For example, if there are strong shortages in certain occupations (e.g., ICT professionals) that use specific skills more intensively (e.g., systems analysis), then the skills shortage indicator will show those skills as a shortage.

The skills mapped to occupations using O*NET can be classified into six skills categories:

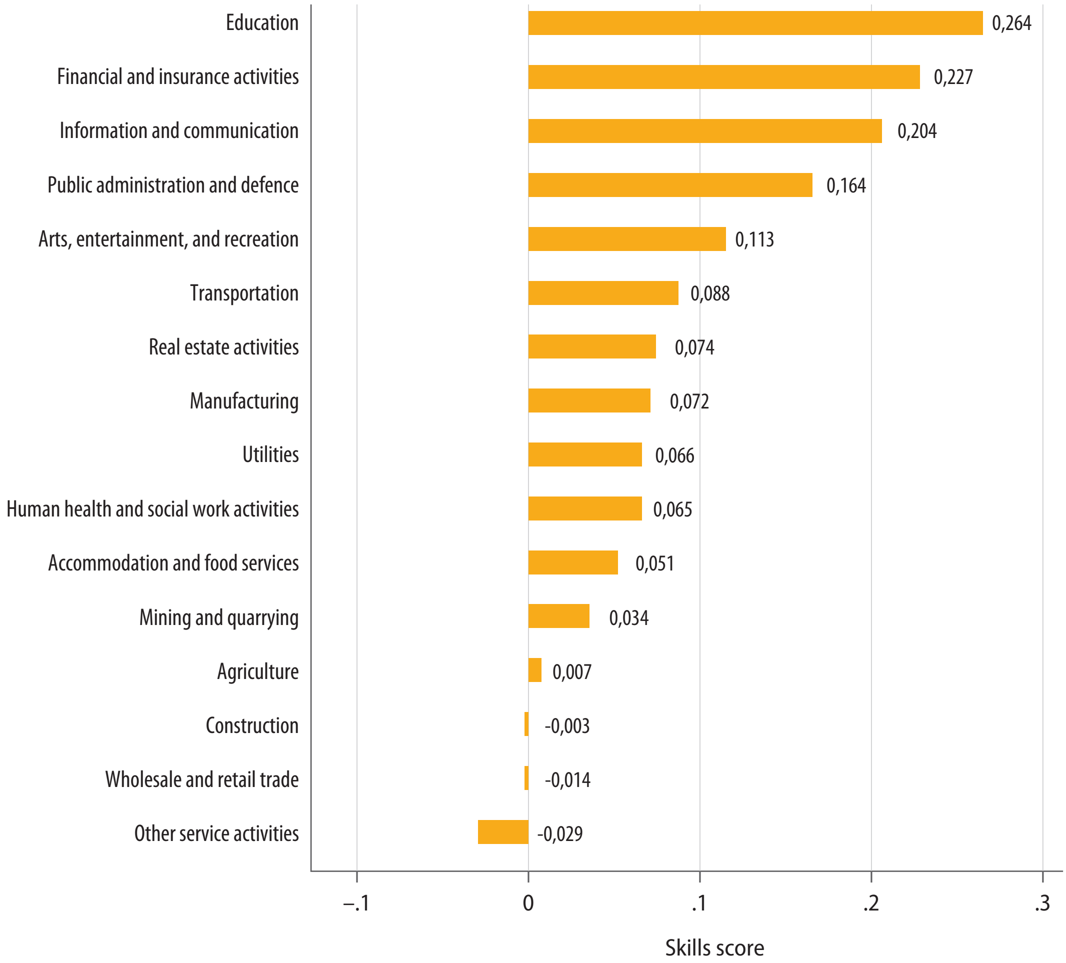
1. *Basic skills*, or skills that "facilitate learning or the more rapid acquisition of knowledge";
2. *Complex problem-solving skills*, or skills that are "used to solve novel, ill-defined problems in complex, real-world settings";
3. *Resource management skills*, or skills that are "used to allocate resources efficiently";
4. *Social skills*, or skills that are "used to work with people to achieve goals";
5. *Systems skills*, or skills that are "used to understand, monitor, and improve socio-technical systems"; and
6. *Technical skills*, or skills that are "used to design, set-up, operate, and correct malfunctions involving the application of machines or technological systems". (O*NET, 2019)

Figure 7.3 shows the shortages (+) or surpluses (-) for each industry, computed by taking an arithmetic mean of each of these six broad skills groups' scores for each industry.

21 In this section, the term 'skills' refers to competencies. The OECD report and O*NET database used to calculate these shortages in competencies (associated with occupational shortages) refer to competencies as 'skills'.

22 It must be noted that the O*NET database is based on US occupational classifications, which may not be appropriate in the South African context. O*NET, however, is required to make use of the OECD methodology as it maps specific skills and capabilities to occupations. A crosswalk can be used to link South African occupational classifications such as OFO to O*NET; nevertheless, some concerns may remain about the mapping of occupations across different standards. OECD-calculated skills shortages that have not adopted the O*NET classification are reported here.

FIGURE 7.3: Shortage and surplus index by industry, 2016

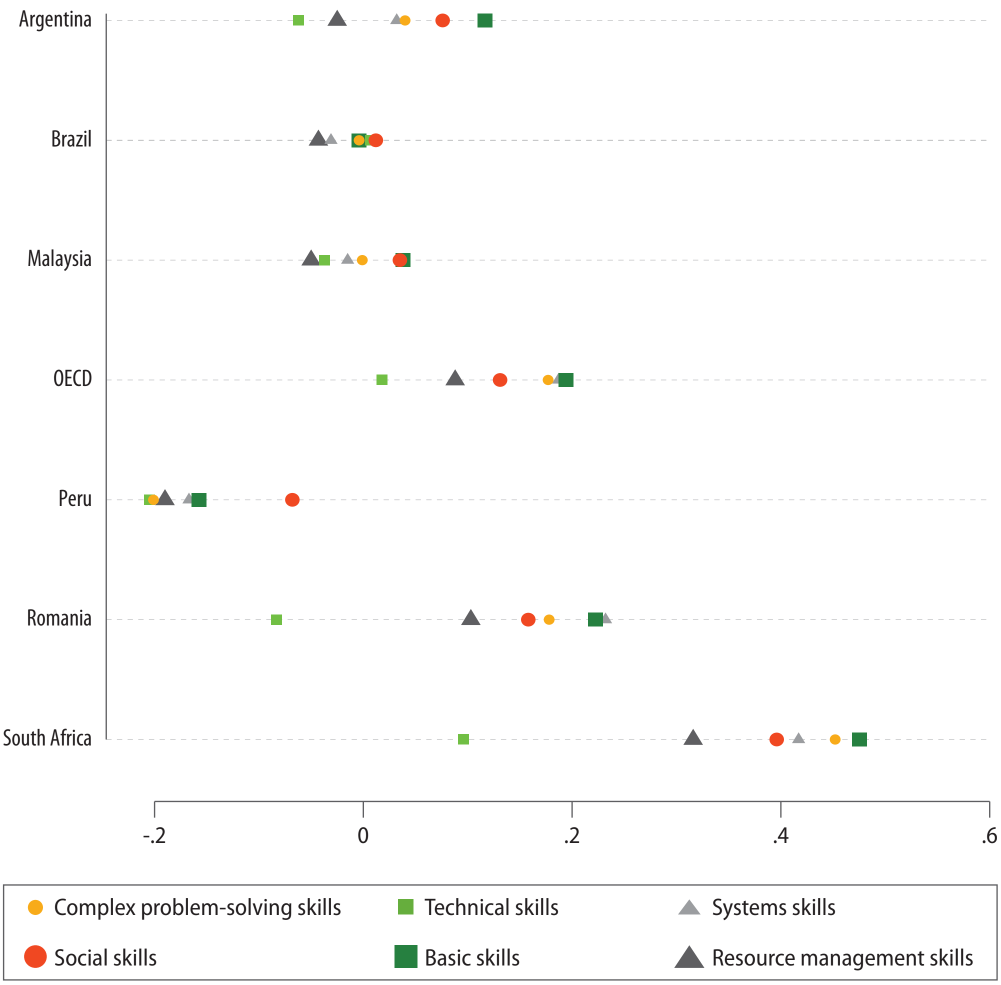


Source: Own calculations, OECD Skills for Job Database (2019b)

The figure indicates that 13 of the 16 industries listed are experiencing skills shortages. These shortages are most present in the education, financial and insurance activities, information and communication, and public administration and defence industries. Only three industries – construction, wholesale and retail trade, and other services activities – have skills scores that are in surplus. However, their scores are very low, suggesting that these industries only have marginal surplus skills. Construction, wholesale and retail trade, and other service activities are industries that typically have a large contingent of low-skilled workers, which could possibly explain the surplus skills requirements in these industries.

Figure 7.4 shows the shortages (+) or surpluses (-) of each of the six skills groups noted above for South Africa in comparison to five middle-income countries and the OECD, an intergovernmental economic organisation consisting of 36 members, most of which are high-income economies. The five middle-income countries were selected based on data availability and the similarity of their socioeconomic profiles and South Africa's.

FIGURE 7.4: Skills needs indicators across selected countries, 2016



Source: Own calculations, OECD Skills for Jobs Database (2019b)

It is striking that South Africa has far greater skills shortages in terms of competencies across all skills groups compared to the other selected countries. Most skills groups in South Africa are around 0.40, while the country with the second greatest shortages, Romania, has scores between 0.15 and 0.20 (with the exception of technical skills). The OECD group has the third most severe shortages, with scores ranging from 0.09 (resource management skills) to 0.2 (basic skills). There is a shortage of most skills in Argentina, while Brazil's and Malaysia's scores are centered around 0, indicating neither a surplus nor a shortage of skills. Peru is the only country in the sample that has all of its skills in surplus.

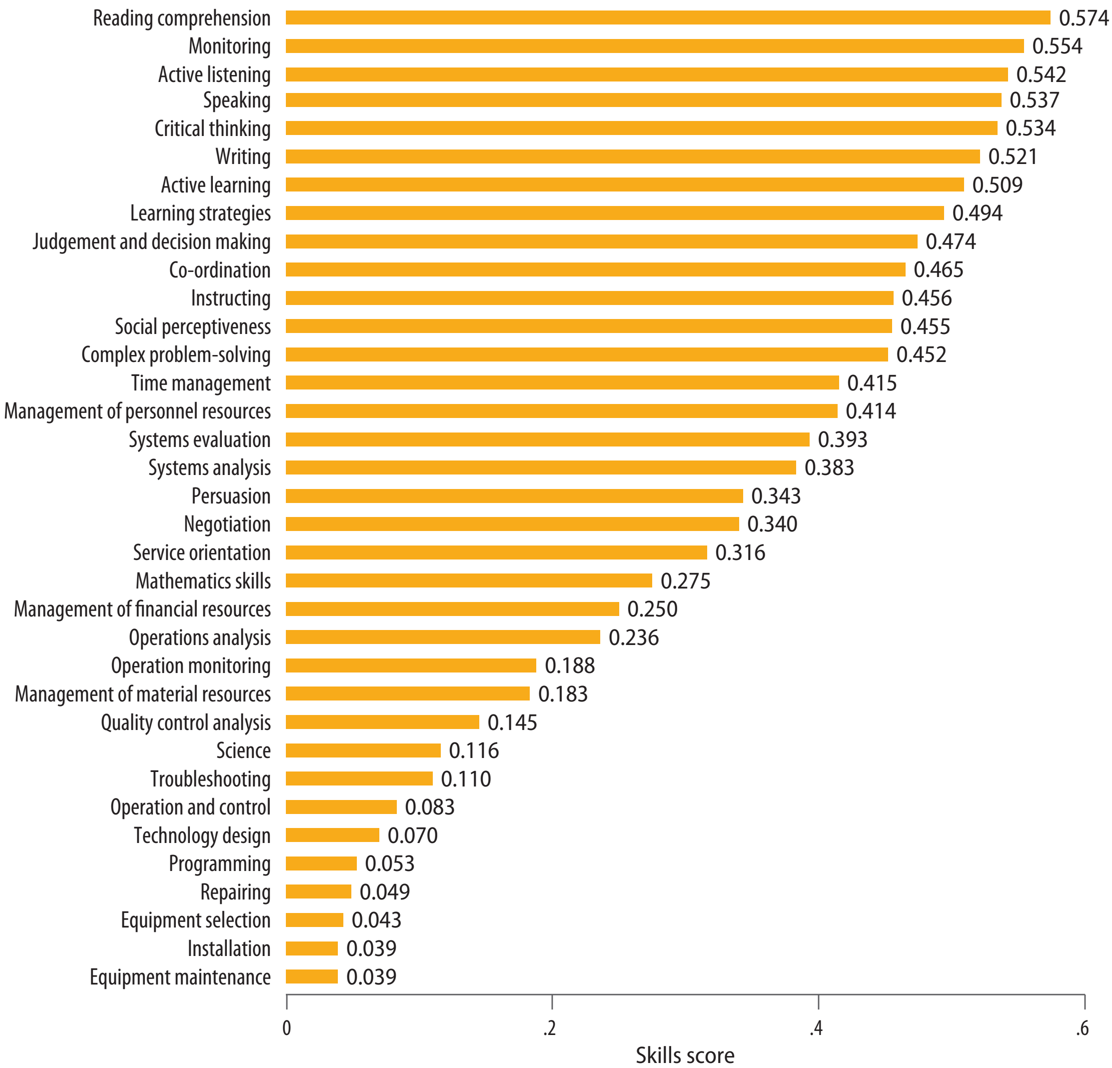
Moreover, across all countries (with the exception of Romania and Brazil), the skills that are most associated with shortage are basic skills. Other skills that show a high degree of shortage are complex problem-solving skills, systems skills, and social skills. On the other hand, skills that are in surplus (or that show the least degree of shortage) are technical and resource management skills.

Finally, across all countries, clustering seems to be apparent, indicating that the skills shortages (or surpluses) are broadly similar across all skills groups. This could imply that different types of skills are linked to one another. For example, if a country has a shortage of complex problem-solving skills, then it is also likely to have a shortage of technical skills. However, greater research needs to be undertaken on whether skills are correlated with one another or whether there is a stronger causal link.

PART 7

Figure 7.5 shows the skills shortages (+) in South Africa, as calculated by the OECD, for the constituent parts of each of the six skills groups.

FIGURE 7.5: Skills shortages for skills types in South Africa, 2016



Source: Own calculations, OECD Skills for Jobs Database (2019b)

Individual skills shortages are particularly acute for reading comprehension, active listening, speaking, and writing skills. Monitoring, learning strategies, critical thinking, and active learning are also marked by great shortages. What all these skills have in common is that they are considered basic skills. A lack of basic skills is worrying, as mastery of such skills is usually a prerequisite for obtaining more specialised skills. At the other end of the spectrum, skills shortages are smallest for installation, equipment maintenance, and equipment installation – all considered technical skills.

7.1.3. Graduate unemployment

High unemployment among individuals with particular qualifications may be an indicator of a surplus of particular qualifications and the types of skills competencies associated with those qualifications. Here, unemployment among HE and TVET graduates by field of study in 2013 and 2019 is considered, in order to provide signals of skills surplus relative to demand.[23]

23 This analysis will be supplemented by the results of a forthcoming Labour Market Intelligence Programme output that will focus on trends in graduate unemployment in more detail. The findings of that report will be incorporated into subsequent iterations of the *Skills Supply and Demand in South Africa* report.

Table 7.1 shows the number and share of unemployed graduates with HE qualifications by field of study in Q2 2013 and Q2 2019. It shows that, between Q2 2013 and Q2 2019, the number of unemployed individuals with HE qualifications more than doubled, from 66 600 to 149 100. This represents an annual average increase of 14.4 percent per year over the period.

TABLE 7.1: Number and share of unemployed individuals with HE qualifications by study field, Q2 2013 and Q2 2019

	NUMBER OF UNEMPLOYED		SHARE OF UNEMPLOYED		CHANGE IN UNEMPLOYED		
	Q2 2013 ('000s)	Q2 2019 ('000s)	Q2 2013 (%)	Q2 2019 (%)	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)
Business	35.4	56.0	53.1	37.5	20.6	25.0	8.0
Science	4.0	8.1	6.0	5.4	4.2	5.0	12.7
Engineering	3.6	10.4	5.4	7.0	6.8	8.2	19.2
Health	0.9	7.9	1.3	5.3	7.1	8.5	44.3
Arts	0.4	0.9	0.6	0.6	0.5	0.6	13.9
Education	5.2	22.7	7.9	15.2	17.5	21.2	27.7
Other humanities	8.3	28.8	12.4	19.3	20.5	24.9	23.1
All other	8.8	14.2	13.3	9.5	5.4	6.5	8.3
Total	**66.6**	**149.1**	**100.0**	**100.0**	**82.5**	**100.0**	**14.4**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.

This figure is an indication that there is insufficient demand to absorb the increased number of individuals with HE qualifications. By field of study, business graduates account for a quarter (25 percent) of the total increase in unemployed individuals. Education and other humanities account for 21.2 percent and 24.9 percent, respectively, of the total increase in unemployed individuals. These three fields of study thus collectively account for over 70 percent of the increase in unemployed graduates over the period.

This analysis also considers growth rates in the number of unemployed individuals with HE qualifications in particular fields as signals of imbalances between graduates produced in the PSET system and graduates in demand.

Growth in unemployment has been particularly high for health, education, and other humanities graduates, with unemployment among these individuals growing at average annual rates of 44.3 percent, 27.7 percent, and 23.1 percent, respectively. As a result of this rapid growth, the share of unemployment for these three fields of study increased between Q2 2013 and Q2 2019, standing now at 5.3 percent, 15.2 percent, and 19.3 percent, respectively.

Growth in unemployment has also been higher than the overall average for engineering graduates, at 16.4 percent per year. Individuals with engineering qualifications accounted for 7 percent of the total unemployed with HE qualifications in Q2 2019, up from 5.4 percent in Q2 2013.

The business field of study had the lowest rate of increase in unemployed individuals, with unemployment among these graduates growing at 8 percent per year. Consequently, the field's share of unemployment declined from 53.1 percent in Q2 2013 to 37.5 percent in Q2 2019. The number of unemployed arts graduates remains low, with this field's share of the total unemployed with HE education qualifications unchanged at 0.6 percent.

The number of unemployed individuals with science degrees more than doubled, from 4 000 in Q2 2013 to 8 100 in Q2 2019, increasing at an annual average rate of 12.7 percent. This is an unexpectedly large increase – although the increase has been lower than the overall increase across all fields.

It thus seems that there is insufficient demand for HE qualifications overall but that graduates in business, education, health, other humanities, and engineering are the worst affected. Collectively, individuals with business and other humanities qualifications account for half of the total increase in unemployed graduates.

Table 7.2 now shows the number and share of unemployed individuals with TVET qualifications by field of study in Q2 2013 and Q2 2019. For this group, the number of unemployed increased from 312 500 in Q2 2013 to 554 600 in Q2 2019.

TABLE 7.2: Number and share of unemployed individuals with TVET qualifications by study field, Q2 2013 and Q2 2019

	NUMBER OF UNEMPLOYED		SHARE OF UNEMPLOYED		CHANGE IN UNEMPLOYED		
	Q2 2013 ('000s)	Q2 2019 ('000s)	Q2 2013 (%)	Q2 2019 (%)	ABSOLUTE ('000s)	SHARE OF CHANGE (%)	AAGR (%)
Business	94.8	216.3	30.3	39.0	121.5	50.2	14.7
Science	31.7	32.4	10.1	5.8	0.7	0.3	0.3
Engineering	80.6	138.4	25.8	25.0	57.8	23.9	9.4
Health	16.2	22.9	5.2	4.1	6.7	2.8	5.9
Arts	4.0	3.4	1.3	0.6	-0.6	-0.3	-2.8
Education	16.9	25.7	5.4	4.6	8.7	3.6	7.2
Other humanities	21.7	20.6	7.0	3.7	-1.2	-0.5	-0.9
All other	46.5	95.0	14.9	17.1	48.5	20.0	12.7
Total	**312.5**	**554.6**	**100.0**	**100.0**	**242.1**	**100.0**	**10.0**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.

The rate of increase of unemployment for individuals with TVET qualifications has been lower than for those with HE qualifications, with overall unemployment growing at an average annual rate of 10 percent.

The greatest increase in the number of unemployed individuals is seen for those with business qualifications. Individuals with business qualifications account for half (50.2 percent) of the total increase in unemployment. This group recorded the greatest absolute increase, with the number of unemployed individuals growing at an average rate of 14.7 percent annually. Individuals with engineering qualifications account for 23.9 percent of the change in unemployed individuals. Unemployment among these individuals increased at a rate of 9.3 percent per year.

There were also increases in unemployment among individuals with education and health qualifications, who saw their unemployment growing at average annual rates of 7.2 percent and 5.9 percent, respectively. Unemployment among individuals with arts and other humanities qualifications decreased slightly over the period. Unemployment among individuals with science qualifications was virtually unchanged over the period (growing at an annual average rate of 0.3 percent).

In terms of the share of unemployment, business and engineering account for 64 percent of unemployed individuals with TVET qualifications. The share increased from 30.3 percent in Q2 2013 to 39 percent in Q2 2019 for business, while the share declined slightly for engineering (from 25.8 percent to 25 percent).

The number of unemployed individuals with TVET qualifications in all other fields of study has almost doubled over the period, from 46 500 in Q2 2013 to 95 000 in Q2 2019. The share of all other fields of study increased from 14.9 percent to 17.1 percent, with growth in unemployment for this group increasing at a rate second only to business (12.7 percent). The remaining fields of study (science, health, arts, education, other humanities) recorded a decrease in the share of unemployment among those with TVET qualifications.

The numbers are suggestive of insufficient demand for, or oversupply of, individuals with TVET qualifications in business, all other fields of study, and engineering in particular. The number of unemployed has also increased among those with health and education qualifications, suggesting an imbalance between demand and supply for these fields as well. There was virtually no increase in the number of unemployed for those with science qualifications, as well as a decline in the number of unemployed with arts and other humanities qualifications. Science accounted for 5.8 percent of the unemployed in Q2 2019, down from 10.1 percent in Q2 2013, while arts and other humanities accounted for just 0.6 percent and 3.7 percent of all unemployed with TVET qualifications in Q2 2019. This suggests that, while there is still some imbalance surrounding these qualifications (indicated by the fact that there are still individuals unemployed with these qualifications), these imbalances are not as significant as those for business and engineering in particular at this level.

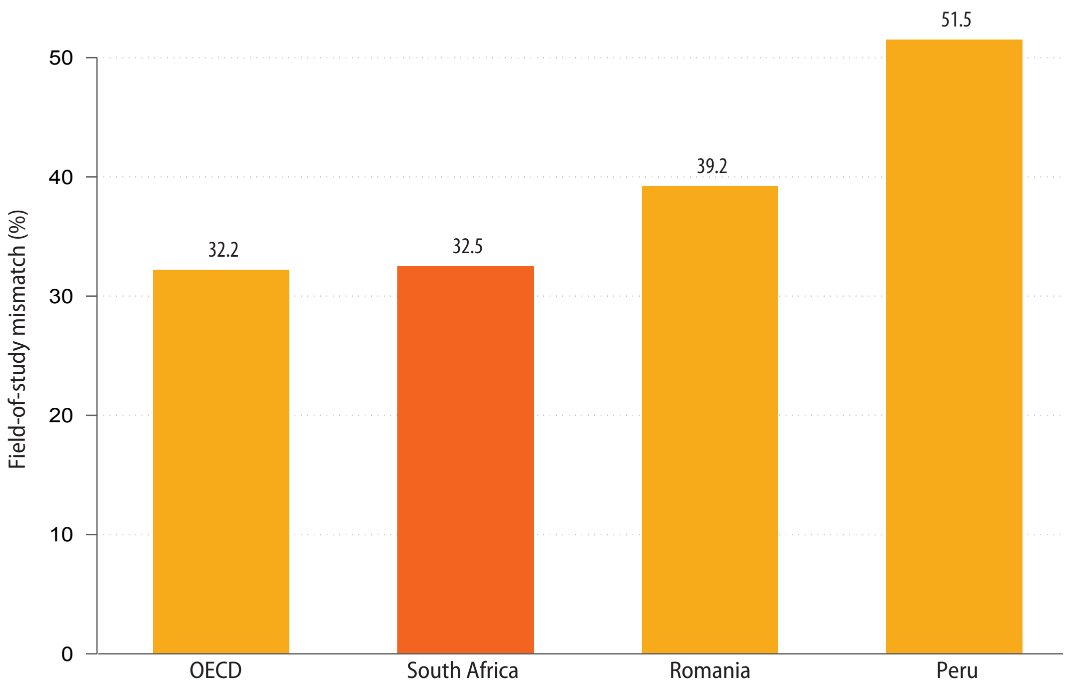
7.2. Skills mismatches

This section compares mismatch indicators for South Africa with two countries with a similar socio-economic profile (based on data availability) and the OECD. The three indicators calculated by the OECD are field-of-study mismatch, underqualification, and overqualification, which are explained in more detail below. The analysis also presents a profile of the employed by field of study in 2013 and 2019, in order to consider field-of-study mismatches in particular over time.

7.2.1. Field-of-study mismatch

The OECD's field-of-study mismatch indicator shows the proportion of individuals who studied in one field but work in another field. For example, an individual who majored in history but works as a statistician would be considered a mismatched individual. Figure 7.6 shows the field-of-study mismatch indicator for South Africa and a number of other countries.

FIGURE 7.6: Field-of-study mismatch in South Africa and selected countries, 2016



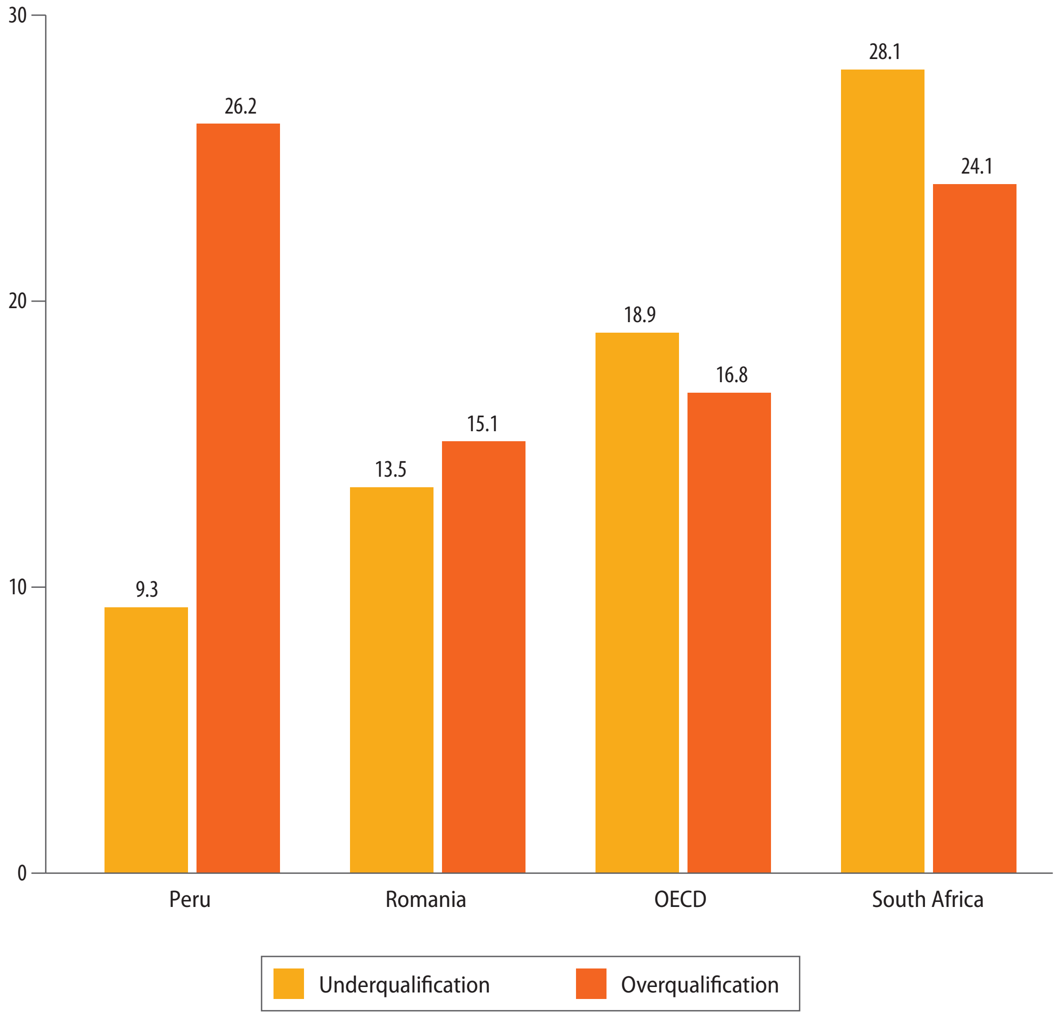
Source: Own calculations, OECD Skills for Jobs Database (2019b)

South Africa's field-of-study mismatch (32.5 percent) is similar to the average for OECD countries. It is, however, lower than for Romania and Peru (39.2 and 51.5 percent, respectively). Therefore, the indicators suggest that, in terms of field-of-study mismatch, South Africa is aligned to high-income countries. Despite this favourable comparison, it must still be emphasised that South Africa's figure suggests that nearly a third of people work in a field for which they did not study.

7.2.2. Qualification mismatch

The OECD also provides an indicator of qualification mismatch. As part of this calculation, the modal qualification for each occupation for each country at a particular time was first computed. This figure was then used to determine whether an individual was under- or overqualified: an individual working in an occupation who had an educational attainment level below (or above) that of the mode would be considered under- (or over-) qualified. In Figure 7.7, the incidence of under- and overqualification calculated by the OECD for 2016 is shown.

FIGURE 7.7: Incidence of qualification mismatch in South Africa and selected countries, 2016



Source: Own calculations, OECD Skills for Jobs Database (2019b)

In South Africa, 28 percent of the employed in 2016 were determined to be underqualified, while 24 percent were determined to be overqualified. This is indicative of considerable qualification mismatch in the South African economy. Compared to Peru, Romania, and the OECD, South Africa has a far higher proportion of underqualified individuals: 28 percent compared to between 9 percent and 19 percent for the other three points of comparison. South Africa also has a higher proportion of overqualified individuals than OECD countries. However, South Africa has a similar proportion of overqualified individuals to Peru (26.2 percent).

Skills gaps

Apart from the skills required for occupations where there are shortages, those who are employed often require skills that they do not currently have. These missing skills are a form of skills mismatch and can be termed 'skills gaps'. A 2019 survey conducted by SETAs revealed the perspective of a number of South African companies on the skills gaps experienced in the country. Skills gaps, as mentioned, are skills that employees need, but do not have, in order to carry out job tasks competently. It is noted in the SETA report that these are also referred to as 'top-up skills'.

The top five skills gaps identified by SETAs across all occupational levels were the following (in descending order): management and leadership, computer skills, communication, financial skills, and technical skills. For managers, the most common skills gaps (in descending order) were management and leadership, finance, communication, emotional intelligence, and strategy. For technicians, artisans, and clerical workers, the most common skills gaps identified were computer skills, supervisory skills, communication, finance, and management. For operators and elementary workers, the most common skills gaps (in descending order) were computer skills, technical skills, literacy and numeracy, communication, and people management.

7.2.3. Signals of field-of-study and qualification mismatch: Profile of the employed by industry, occupation, and qualification

Here, the industries and occupations in which individuals with HE and TVET qualifications are employed are considered, in order to provide an indication of whether there is a mismatch in the qualification fields of individuals and the occupations and industries in which they are employed.

Such a qualification–job match analysis attempts to obtain signals on whether the right number and types of qualifications are being produced to meet the needs of employers, as well as whether individuals are working in industries and occupations linked to their qualifications.

Table 7.3 shows the total number of individuals employed with HE qualifications, as well as the share of the employed in each industry for each field of study.

TABLE 7.3: Share of employed with HE qualifications by study field and main industry, Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS		SCIENCE		ENGINEERING		HEALTH		ARTS		EDUCATION		OTHER HUMANITIES		ALL OTHER		TOTAL	
	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)
Agriculture	0.4	0.2	2.0	4.6	1.1	0.5	1.4	1.1	0.0	0.0	0.0	0.1	0.7	0.0	13.8	1.2	1.2	0.6
Mining	0.8	1.3	2.8	0.0	4.8	2.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.4	1.4	1.4	1.2	0.8
Manufacturing	9.2	8.3	17.3	9.3	20.5	12.9	4.5	0.4	8.7	8.5	1.0	0.0	6.7	2.3	7.3	9.2	8.5	5.9
Utilities	2.3	1.5	0.0	0.0	8.9	7.8	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.7	0.0	1.5	1.8	1.7
Construction	1.6	2.3	1.1	4.6	5.8	10.7	0.0	0.0	0.0	1.9	0.5	1.5	1.2	1.6	0.0	1.6	1.5	2.8
Wholesale and retail trade	10.9	8.5	3.3	6.6	7.6	6.8	2.5	3.2	13.9	9.9	1.2	1.6	5.4	7.5	10.7	9.1	6.6	6.3
Transport, storage, and communication	7.3	6.3	4.2	2.5	6.0	7.1	0.0	0.0	6.1	6.1	1.5	0.3	4.3	1.9	4.7	9.6	4.5	4.1
Financial and business services	44.6	48.7	33.9	31.4	34.6	35.6	6.7	2.1	24.2	28.1	2.1	1.5	18.7	23.9	10.1	29.3	25.3	28.0
CSP services	23.0	22.6	35.2	40.9	10.6	16.7	84.8	93.2	47.1	45.4	93.1	94.6	62.0	60.7	52.0	35.1	49.3	49.5
Private households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Other/ unspecified	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	1.4	0.1	0.2
Total ('000s)	**391.2**	**511.6**	**80.8**	**100.8**	**134.2**	**155.1**	**123.2**	**120.9**	**20.8**	**27.5**	**230.6**	**319.1**	**158.5**	**152.2**	**49.1**	**105.2**	**1 188.4**	**1 492.3**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.
3. Table A.4 in the Appendix shows the numbers (and not shares) of graduates in each field of study in both Q2 2013 and Q2 2019.

PART 7

Table 7.3 shows that, in Q2 2019, the majority of employed graduates worked in two industries: community, social, and personal (CSP) services (49.5 percent) and financial and business services (28 percent). These shares both increased between Q2 2013 and Q2 2019, indicating that graduates are increasingly being employed in these two industries. Only 5.9 percent of graduates were employed in manufacturing in Q2 2019 (down from 8.5 percent in Q2 2013), while 6.3 percent were employed in the wholesale and retail trade industry (down slightly from 6.6 percent in Q2 2013).

The CSP services industry includes government services. Employment of individuals across all fields of study increased between Q2 2013 and Q2 2019 in this industry. The share of employment for each category of degree also increased between Q2 2013 and Q2 2019. CSP services is, expectedly, the largest employer of health graduates, accounting for the employment of 93.2 percent of these graduates in Q2 2019 (up from 84.8 percent in Q2 2013). 94.6 percent of education graduates were also employed in this industry in Q2 2019 (increasing from 93.1 percent in 2013).

The remaining health graduates were employed in small numbers in wholesale and retail trade, financial and business services, agriculture, and manufacturing in Q2 2019. Strikingly, there seems to have been a considerable decline in the share of individuals with health degrees employed in manufacturing. It is not necessarily the case that the small numbers of health graduates employed in these additional industries are an indication of mismatch, since health-qualified individuals may possess skills that are appropriate in other fields as well.

The remaining education graduates were employed in small numbers in trade, financial and business services, construction, utilities, and transport, storage, and communication. There may be some mismatch here: specifically, individuals with education degrees being employed in industries other than CSP services may indicate that these individuals were unable to find employment in the field in which they studied.

Two-thirds (60.7 percent) of other humanities graduates were employed in CSP services in Q2 2019, while 23.9 percent were employed in financial and business services (with the share increasing between Q2 2013 and Q2 2019). The remaining other humanities graduates were employed mainly in trade (7.5 percent), manufacturing (2.3 percent), transport, storage, and communication (1.9 percent), utilities (1.7 percent), and construction (1.6 percent) in Q2 2019. Again, the extent of mismatch here is unclear, given that humanities graduates may possess skills that are applicable to a number of different industries. The analysis also notes a considerable decline in the share of employment in manufacturing for these graduates (from 6.7 percent in Q2 2013 to 2.3 percent in Q2 2019).

Over two-fifths (45.4 percent) of arts graduates were employed in CSP services in Q2 2019, while 28.1 percent were employed in financial and business services. The remaining arts graduates were employed in trade (9.9 percent), manufacturing (8.5 percent), transport, storage, and communication (6.1 percent), and construction (1.9 percent) in Q2 2019. Once again, it is not clear what the extent of mismatch is in these respective areas. Although one might not expect arts graduates to be employed in fields that are considered to be technical, such as manufacturing and utilities, it is possible that there are a number of jobs in these industries that would require their skills.

Two-fifths (40.9 percent) of science graduates were employed in CSP services in Q2 2019, while 31.4 percent were employed in financial and business services. The remaining graduates were employed mainly in manufacturing (9.3 percent), trade (6.6 percent), construction (4.6 percent), and agriculture (4.6 percent) in Q2 2019. The extent of mismatch is not clear here either, given that all of these industries could require the skills of science graduates. However, the 6.6 percent of science graduates employed in trade may suggest that these graduates found employment in a field that does not require their skill set. The decline in the manufacturing share of science graduates is noted as well, with this share declining from 17.3 percent in Q2 2013 to 9.3 percent in Q2 2019.

There are only two fields in which the CSP services industry is not the largest employer. These are engineering, where financial and business services accounted for the largest share of graduates in Q2 2019 (35.6 percent), and business, where, expectedly, financial and business services accounted for the largest share (48.7 percent). In Q2 2019, CSP services accounted for 16.7 percent and 22.6 percent of the employment of graduates in these fields, respectively.

The remaining engineering graduates were employed in manufacturing (12.9 percent), construction (10.7 percent), trade (6.8 percent), utilities (7.8 percent), and transport, storage, and communication (7.1 percent). Across all fields of study, engineering degree holders seem to be employed in the widest range of industries. This may be indicative of mismatch, to the extent that those with engineering qualifications are not necessarily being employed in industries that are explicitly engineering-related.

The remaining business graduates were employed mainly in manufacturing (8.3 percent), trade (8.5 percent), and transport, storage, and communication (6.3 percent). Smaller numbers of business graduates were also employed in utilities, construction, and mining. As business qualifications impart skills that can be applied across a variety of activities, the extent of mismatch among business degree holders cannot be clearly determined based on these shares.

Employment of individuals with HE qualifications in all other fields increased considerably over the period, from 49 100 in Q2 2013 to 105 200 in Q2 2019. Over a third (35.1 percent) of these individuals were employed in CSP services in Q2 2019 (down from 52 percent in Q2 2013). Close to three out of ten (29.3 percent) were employed in financial and business services (up considerably from 10.1 percent in Q2 2013). The rest were employed mainly in transport, storage, and communication (9.6 percent), manufacturing (9.2 percent), and trade (9.1 percent) in Q2 2019. Because the aggregated data do not show the individual fields of study for this category, it is not clear what the extent of mismatch is for these individuals.

Table 7.4 shows the total number of individuals employed with TVET qualifications, as well as the share of the employed in each industry for each field of study.

TABLE 7.4: Share of employed with TVET qualifications by study field and main industry, Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS		SCIENCE		ENGINEERING		HEALTH		ARTS		EDUCATION		OTHER HUMANITIES		ALL OTHER		TOTAL	
	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)
Agriculture	0.4	0.5	9.7	9.2	0.7	0.1	0.4	0.0	0.0	0.0	0.6	0.3	0.6	2.4	0.3	0.9	1.1	0.8
Mining	2.0	2.0	1.0	3.8	8.2	7.0	0.1	0.4	0.0	0.0	0.2	0.6	1.4	2.0	0.9	2.7	2.7	3.0
Manufacturing	13.5	12.2	8.9	9.2	19.3	18.1	2.3	0.4	12.3	17.0	1.8	2.2	10.0	10.5	15.4	15.4	11.7	11.5
Utilities	1.6	0.6	0.0	0.8	4.7	7.3	0.6	1.7	0.0	0.0	0.0	0.0	0.9	2.1	2.0	0.9	1.8	2.3
Construction	2.1	3.2	4.6	2.9	12.4	13.4	1.8	0.8	0.0	0.0	1.1	1.9	5.2	2.8	3.5	6.0	4.7	5.6
Wholesale and retail trade	21.1	19.9	17.9	9.5	13.2	14.5	6.0	4.8	7.4	23.1	3.4	2.6	15.4	12.3	15.4	11.9	14.1	13.0
Transport, storage, and communication	6.1	7.5	3.3	5.5	8.0	6.6	0.4	1.7	0.0	0.0	0.8	2.1	10.6	2.3	6.7	8.1	5.4	5.8
Financial and business services	25.8	25.9	24.9	30.7	18.5	21.0	3.7	5.2	38.8	33.3	2.9	1.1	11.6	13.2	22.7	20.8	17.5	18.4
CSP services	26.7	28.1	26.4	28.4	14.5	11.6	84.8	84.0	41.4	26.6	88.8	88.3	44.2	52.4	32.5	32.8	40.5	39.3
Private households	0.4	0.1	3.3	0.0	0.4	0.3	0.0	0.9	0.0	0.0	0.4	0.9	0.0	0.0	0.5	0.6	0.5	0.4
Other/ unspecified	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ('000s)	**599.4**	**645.1**	**137.8**	**85.4**	**456.3**	**517.0**	**206.2**	**209.8**	**15.5**	**18.6**	**289.8**	**289.1**	**163.8**	**113.1**	**223.8**	**359.3**	**2 092.4**	**2 237.2**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.
3. Table A.5 in the Appendix shows the numbers (and not shares) of graduates in each field of study in both Q2 2013 and Q2 2019.

Table 7.4 shows that, in Q2 2019, as was the case for HE graduates, the majority of employed individuals with TVET qualifications were employed in CSP services (39.3 percent) and financial and business services (18.4 percent). However, whereas over three-quarters (77.5 percent) of employed HE graduates were employed in these industries, only 57.7 percent of employed individuals with TVET qualifications were employed in these industries. This share was virtually unchanged from Q2 2013.

At 2.2 million (up from 2.1 million in Q2 2013), the number of individuals with TVET qualifications who were employed in Q2 2019 did not increase as much as the number of HE graduates who were employed. For those with HE qualifications, there was an increase in employment from 1.2 to 1.5 million between Q2 2013 and Q2 2019. The gap between the number of employed HE graduates and the number of employed TVET graduates thus declined over the period.

Considering potential mismatches among TVET graduates, those with health and education qualifications in particular would be expected to be predominantly employed in CSP services, as was true for HE qualifications. This does seem to be the case, with 84 percent of health-qualified TVET graduates and 88.3 percent of education-qualified graduates being employed in CSP services in Q2 2019. There does seem to be some mismatch, though, with individuals with health qualifications being employed in trade (4.8 percent), financial and business services (5.2 percent), transport, storage, and communication (1.7 percent), utilities (1.7 percent), and construction (0.8 percent) in Q2 2019. Individuals with education qualifications were also employed in non-education industries such as trade (2.6 percent), construction (1.9 percent), manufacturing (2.2 percent), and transport, storage, and communication (2.1 percent).

There has been a considerable decline in the number of employed individuals with arts qualifications in CSP services (from 41.4 percent in Q2 2013 to 26.6 percent in Q2 2019). There has been a corresponding increase in the share of arts-qualified graduates in trade (7.4 percent to 23.1 percent). There were also individuals with arts qualifications employed in manufacturing (17 percent) and financial and business services (26.6 percent) in Q2 2019. There were, however, a relatively low number of individuals with arts qualifications in both Q2 2013 and Q2 2019, which may explain these considerable shifts. There does seem to be some mismatch here, as arts graduates would not be expected to be employed in industries that require technical skills, such as manufacturing. Arts graduates employed in the trade industry may also be indicative of mismatch. However, as with HE arts graduates, it may also be the case that the skills possessed by TVET arts graduates are a good match for certain technical or trade jobs.

Over half (52.4 percent) of employed individuals with other humanities qualifications were employed in CSP services in Q2 2019 (up from 44.2 percent in Q2 2013). There were also considerable numbers employed in financial and business services (13.2 percent), trade (12.3 percent), and manufacturing (10.5 percent). There may or may not be mismatch here, with respect to employment in the manufacturing and trade industries in particular, given that humanities graduates possess skills that could be applied to a range of different industries.

CSP services was the largest employer of individuals with TVET qualifications in the field of business (28.1 percent) in Q2 2019, followed closely by financial and business services (25.9 percent). There were also considerable shares of individuals with business qualifications employed in trade (19.9 percent), manufacturing (12.2 percent), and transport, storage, and communication (7.5 percent). The spread of business graduates cannot clearly be linked to any mismatch, however, given that their skills can be applicable across all sectors and industries.

The largest employer of both science and engineering TVET-qualified individuals in Q2 2019 was financial and business services (30.7 percent and 21 percent, respectively). Other major employers of individuals with science qualifications were CSP services (28.4 percent), trade (9.5 percent), agriculture (9.2 percent), and manufacturing (9.2 percent). It is not clear from these shares that there is any major mismatch, given that science graduates are likely to possess skills that can be applied across different industries. Having said that, it may be unexpected that the share of these individuals in non-technical services industries is as high as it currently is. Other notable employers of individuals with engineering qualifications were manufacturing (18.1 percent), trade (14.5 percent), construction (13.4 percent), and CSP services (11.6 percent). Again, across all TVET fields of study, individuals with engineering qualifications seem to be employed in the widest range of industries. As with HE-qualified engineers, this spread may be indicative of mismatch, with TVET-qualified engineers not necessarily being employed in industries that are explicitly engineering-related.

Employment among individuals with TVET qualifications in all other fields increased from 223 800 in Q2 2013 to 359 300 in Q2 2019. Of these individuals, close to a third (32.8 percent) were employed in CSP services (virtually unchanged from 32.5 percent in Q2 2013), and just over one in five (20.8 percent) were employed in financial and business services (down from 22.7 percent in 2013). Other major industries of employment for these individuals in Q2 2019 were manufacturing (15.4 percent), trade (11.9 percent), and transport, storage, and communication (8.1 percent). Since the aggregated data do not show the individual fields of study for this category, it is not clear what the extent of mismatch is for these TVET graduates.

Table 7.5 shows the total number of individuals employed with HE qualifications, as well as the share of the employed in each occupation for each field of study.

TABLE 7.5: Share of employed with HE qualifications by study field and main occupation (one-digit), Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS		SCIENCE		ENGINEERING		HEALTH		ARTS		EDUCATION		OTHER HUMANITIES		ALL OTHER		TOTAL	
	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)
Managers	37.9	38.8	16.7	39.1	27.7	36.3	16.3	7	34.7	17.4	6.6	8.7	20.7	26.9	17.2	30	23.8	27.3
Professionals	36.7	37	51.7	33.7	50.2	39.6	54.5	73.6	28.4	25.9	13.6	69.5	32.2	32.4	21.6	34	35.2	46.1
Technicians	13.2	8.4	16.8	15.1	7.9	11.5	26	15	21.7	21.1	75.3	16.7	22.6	16.1	37.4	12.2	28.6	12.8
Clerks	7.6	10	5.3	2.6	0	2.1	0.6	1.5	3	4.1	2.2	1.6	16.9	18.4	19.6	14.1	6.5	7.2
Service and sales	2.2	3.5	3.6	3.8	0.3	3.3	0.3	2.3	2.7	29.6	1.1	1.5	5.2	3.6	3.4	6.2	2.1	3.7
Skilled agricultural	0.1	0.2	0.6	0	0.4	0	1.4	0	0	0	0	0.1	0.7	0	0.8	0	0.4	0.1
Craft and related	0.5	0.4	3.9	4	9.5	3.4	0	0	7	1.9	0.2	1.5	1.1	0	0	1.5	1.8	1.2
Operators and assemblers	1.1	1.5	0	0	3.9	1.6	1	0	0	0	0.5	0.3	0.5	0.6	0	0	1.1	0.8
Elementary	0.6	0.4	1.3	1.7	0	2.2	0	0.7	2.4	0	0.5	0	0	2	0	1.4	0.4	0.8
Domestic workers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0	0
Other/ unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ('000s)	**391.2**	**511.6**	**80.8**	**100.8**	**134.2**	**155.1**	**123.2**	**120.9**	**20.8**	**27.5**	**230.6**	**319.1**	**158.5**	**152.2**	**49.1**	**105.2**	**1 188.4**	**1 492.3**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.
3. Table A.6 in the Appendix shows the numbers (and not shares) of graduates in each field of study in both Q2 2013 and Q2 2019.

PART 7

Table 7.5 shows that 86.2 percent of all employed individuals with HE qualifications were employed as managers, professionals, or technicians in Q2 2019, a decline from 87.6 percent in 2013. It is in these higher-skilled professions that one would be expect to find degree holders employed. Overall, it does not seem that there is significant mismatch in this regard.

Close to 14 percent of degree holders in Q2 2019 were employed in fields that are not regarded as high-skilled. Around half of this share was, however, accounted for by clerks, with the share of degree holders employed in clerk positions increasing from 6.5 percent in Q2 2013 to 7.2 percent in Q2 2019. It is not unexpected that degree holders may be employed in such positions, especially in their initial jobs following graduation. The share of employed in the remaining occupational categories (amounting to 6.6 percent of employed degree holders), however, suggests that a number of HE graduates are being employed in positions that are below the level of expectation of employment for a HE qualification.

By field of study, the share of the employed who were not employed as managers, professionals, or technicians in Q2 2019 was highest for arts graduates (35.6 percent, up significantly from 15.1 percent in Q2 2013) and other humanities graduates (24.6 percent, virtually unchanged from 24.4 percent in Q2 2013). The increase in share for arts graduates was primarily due to an increase in the share of arts graduates employed as service and sales workers (29.6 percent in Q2 2019, up from just 2.7 percent in Q2 2013). Clerks accounted for 4.1 percent of arts graduate employment and 18.4 percent of other humanities graduate employment. It should be noted that the total number of individuals with arts qualifications who were employed was considerably low (27 500 in Q2 2019). Overall, though, these shares are suggestive of elevated mismatch in these two fields in particular, with graduates in these two fields failing to gain employment in higher-skilled occupations.

For those with business qualifications, the share of employed individuals not employed as managers, professionals, or technicians increased from 12.1 percent in Q2 2013 to 16 percent in Q2 2019. Business accounts for one in three (34.2 percent) employed individuals with HE qualifications. This suggestion of increasing mismatch among business graduates is concerning. Clerks, however, accounted for 10 percent of the 16 percent of business graduates not employed in more highly skilled occupations. Thus, many business graduates may be employed in positions below their skills capabilities, but these are not necessarily inappropriate occupations.

For engineering, the share accounted for by individuals not employed in the three highest skilled occupations was 12.6 percent in Q2 2019 (down from 14.1 percent in Q2 2013). For science, the share was 12.1 percent (down from 14.7 percent in Q2 2013). For both fields, only around 2 percent of these shares were accounted for by clerk positions. This suggests that there are considerable numbers of engineering and science graduates who are employed in occupations that are not appropriate for their level of qualification.

The health and education fields had the lowest shares (4.5 percent and 5 percent, respectively) of individuals not employed as managers, professionals, and technicians in Q2 2019. Mismatch therefore appears to be low for these fields. These shares have, however, increased since Q2 2013.

For individuals with all other HE qualifications, over three-quarters (76.2 percent) were employed as managers (30 percent, up from 17.2 percent in Q2 2013), professionals (34 percent, up from 21.6 percent), or technicians (12.2 percent, down from 37.4 percent in Q2 2013) in Q2 2019. The share of clerks was 14.1 percent in this cohort, down from 19.6 percent in Q2 2013. Despite these four occupations accounting for the bulk of employment for this group, the share of those employed in occupations other than these four increased between Q2 2013 and Q2 2019, from 4.2 percent to 9.7 percent. This may be an indication of increasing mismatch for individuals employed with HE qualifications in all other fields. The increase in the share of employment held by service and sales workers, from 3.4 percent to 6.2 percent, is particularly suggestive of this possibility.

Table 7.6 shows the total number of individuals employed with TVET qualifications, as well as the share of the employed in each occupation for each field of study.

TABLE 7.6: Share of employed with TVET qualifications by study field and main occupation (one-digit), Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS		SCIENCE		ENGINEERING		HEALTH		ARTS		EDUCATION		OTHER HUMANITIES		ALL OTHER		TOTAL	
	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)	Q2 2013 (%)	Q2 2019 (%)
Managers	26.9	23.9	17.6	21.1	13.9	14.1	4.0	1.4	4.5	15.3	5.7	7.1	15.4	12.0	12.5	16.2	15.6	15.4
Professionals	11.4	4.2	20.3	4.2	18.0	4.2	31.0	5.4	10.6	25.4	4.6	9.2	14.7	7.2	5.2	1.7	14.0	4.9
Technicians	15.0	17.2	16.5	33.4	15.7	24.1	49.4	67.5	55.6	20.6	77.8	65.0	13.1	20.2	16.5	22.3	27.7	31.3
Clerks	30.2	29.0	19.8	14.7	6.4	5.3	5.4	5.6	2.8	19.9	4.7	6.9	27.1	27.8	13.9	15.1	16.2	15.6
Service and sales	8.7	13.0	7.4	12.8	5.0	5.1	7.9	13.2	16.6	8.5	4.4	8.3	17.8	15.3	30.9	24.1	10.3	12.4
Skilled agricultural	0.1	0.1	3.8	3.0	0.5	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.6	0.2	0.4	0.5	0.3
Craft and related	1.3	3.7	2.4	5.3	26.4	31.6	0.8	1.3	10.0	10.3	1.0	2.7	5.2	8.1	11.8	9.9	8.3	11.1
Operators and assemblers	2.1	3.3	5.0	3.0	6.2	8.6	0.6	2.2	0.0	0.0	0.6	0.0	5.0	3.7	4.1	5.7	3.2	4.3
Elementary	4.2	5.4	4.0	2.4	7.5	6.6	0.8	2.6	0.0	0.0	0.6	0.7	1.4	5.1	4.4	3.9	3.8	4.4
Domestic workers	0.1	0.1	3.3	0.0	0.4	0.3	0.0	0.9	0.0	0.0	0.4	0.0	0.0	0.0	0.5	0.6	0.4	0.3
Other/ unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ('000s)	**599.4**	**645.1**	**137.8**	**85.4**	**456.3**	**517.0**	**206.2**	**209.8**	**15.5**	**18.6**	**289.8**	**289.1**	**163.8**	**113.1**	**223.8**	**359.3**	**2 092.4**	**2 237.2**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

Notes:
1. Data on field of study (for Q2) are only available from the year 2013 onwards.
2. A number of graduates are graduates in smaller fields that do not form part of the other seven larger categories. These are included in the 'All other' category.
3. Table A.7 in the Appendix shows the numbers (and not shares) of graduates in each field of study in both Q2 2013 and Q2 2019.

Table 7.6 shows that just under a third (31.3 percent) of all employed individuals with TVET qualifications were employed as technicians in Q2 2019. This share increased from 27.7 percent in Q2 2013. The next highest shares were seen for clerks (15.6 percent in Q2 2019, down from 16.2 percent in Q2 2013), managers (15.4 percent, virtually unchanged from 15.6 percent in Q2 2013), service and sales workers (12.4 percent, up from 10.3 percent in Q2 2013), and craft workers (11.1 percent, up from 8.3 percent in Q2 2013). Collectively, these five occupational categories accounted for 83.7 percent of employed individuals with TVET qualifications in Q2 2019. This suggests that most TVET-qualified employees are employed in appropriate occupations for their level of qualification. It is only the 4.7 percent employed in elementary and domestic occupations who seem to be employed in occupations not appropriate for the level of qualification.

Signals of possible mismatch can be seen in different fields. There were considerable shares of individuals with business qualifications employed in service and sales (13 percent), craft (3.7 percent), operating and assembly (3.3 percent), and elementary (5.4 percent) occupations in Q2 2019. Collectively, around one in four employed individuals with business TVET qualifications were employed in occupations that are not explicitly business-related.

For individuals with science qualifications, the share employed in service and sales (12.8 percent, up from 7.4 percent in Q2 2013), as well as in elementary work (2.4 percent), in Q2 2019 is suggestive of individuals being employed in occupations not linked to their qualifications. Similarly, for engineering, the share in service and sales (5.1 percent) and elementary occupations (6.6 percent) in Q2 2019 may indicate mismatch.

For individuals with health qualifications, the share employed in service and sales (13.2 percent, up from 7.9 percent in Q2 2013) and elementary work (2.6 percent, up from 0.8 percent in Q2 2013) in Q2 2019 is suggestive of mismatch. For education, the share employed in service and sales work was 8.3 percent in Q2 2019 (up considerably from 4.4 percent in Q2 2013), also suggestive of mismatch for this field.

For individuals with arts qualifications, service and sales accounted for 8.5 percent of the employed in Q2 2019, although this share declined from 16.6 percent in Q2 2013. There was a major increase in the share of clerks among this cohort, from 2.8 percent to 19.9 percent, and the share of professionals, from 10.6 percent to 25.4 percent. Individuals with arts qualifications made up only a small number (18 600) of all employed individuals with TVET qualifications.

For employed individuals with other humanities qualifications, possible mismatch is also suggested by the considerable share of this cohort employed in service and sales (15.3 percent) and elementary work (5.1 percent) in Q2 2019. It might also be argued that these workers should not be represented to the extent that they are among technicians in Q2 2019 (20.2 percent, up from 13.1 percent in Q2 2013).

For employed individuals with TVET qualifications in all other fields of study, 22.3 percent were technicians in Q2 2019 (up from 16.5 percent in Q2 2013), 16.2 percent were managers (up from 12.5 percent in Q2 2013), and 1.7 percent were professionals (down from 5.2 percent in Q2 2013). Clerks, meanwhile, accounted for 15.1 percent of this cohort in Q2 2019, up from 13.9 percent in

Q2 2013. It is reasonable that individuals with TVET qualifications would be employed in any of these four occupations. Of concern, however, are the 4.5 percent of employed individuals who were working in elementary occupations in Q2 2019. This suggests that there are a number of individuals with TVET qualifications in all other fields of study who are being employed in low-skilled work. The high share of such individuals employed as service and sales workers (24.1 percent) may also be indicative of mismatch.

Finally, a striking decline in the share of individuals with TVET qualifications who are employed as professionals is noted. This share has collapsed from 14 percent in Q2 2013 to 4.9 percent in Q2 2019. The decline is evident across all fields of study except arts and education. It is not clear what is behind this shift.

7.3. Conclusions and implications for skills planning

The OECD has calculated that there are considerable occupational shortages in South Africa, with the proportion of such occupations higher among higher-skilled occupations. Across occupational groups, the share of occupational shortages ranges from 17 percent for elementary occupations to over 80 percent for managers. This suggests that there is room for the PSET system to be more effective in responding to the occupational and skills needs of the country.

The OECD has also mapped skills competencies to occupational shortages and calculated that skills shortages affect most industries. Shortages were calculated to be most severe in the education, financial and insurance activities, information and communication, and public administration and defence industries. Only three industries did not display skills shortages. These were construction, wholesale and retail trade, and other services activities. The differences across industries emphasise, first, the need for skills planning to respond to the requirements of specific industries and, second, the need for there to be appropriate feedback from these industries, enabling the PSET system to respond to varied skills needs across the economy.

For occupations marked by shortage, shortages in individual skills competencies were shown to be particularly acute for reading comprehension, active listening, speaking, and writing skills. Monitoring, learning strategy, critical thinking, and active learning skills were also in short supply. Concerningly, these are all basic skills, which points to the need for basic skills to be improved across the population.

Unemployment among individuals with HE and TVET qualifications was considered in order to obtain a sense of which degrees that are being attained are being met with adequate demand. Unemployment among individuals with HE qualifications increased at an average rate of 14.4 percent per year between Q2 2013 and Q2 2019, while unemployment among individuals with TVET qualifications grew at an average rate of 10 percent per year over the period.

For those with HE qualifications, business, education, and other humanities graduates accounted for 70 percent of the total increase in unemployment between Q2 2013 and Q2 2019. By rate of increase, growth in unemployment has been highest for those with health, education, other humanities, and engineering qualifications.

For those with TVET qualifications, the greatest increase in unemployed individuals was seen for those with business qualifications. These individuals accounted for half of the total increase in unemployment. Individuals with engineering qualifications accounted for 23.9 percent of the total increase. These numbers are suggestive of insufficient demand for, or oversupply of, individuals with TVET qualifications in business, all other fields of study, and engineering in particular. It seems, however, that there is steady demand for individuals with TVET qualifications in science specifically, as there was virtually no increase in the number of unemployed individuals with science qualifications.

These increases in unemployment are concerning and suggest that, in general, there is insufficient demand for individuals with qualifications in the economy, despite the fact that there are shortages of a considerable number of occupations. The implication is that the qualifications being attained by individuals are not in demand, or that the skills obtained through these qualifications are not aligned with the skills needs of employers.

With respect to skills mismatches, the OECD's field-of-study mismatch indicator shows that 32.5 percent of individuals who studied in one field work in another field. The OECD's qualification mismatch indicators show that 28 percent of the employed in 2016 were underqualified, while 24 percent were overqualified. These figures are indicative of great mismatch in the South African economy.

These mismatches were explored in more detail by considering the profile of employed individuals who had HE and TVET qualifications in 2013 and 2019 by both industry and occupation. While this analysis revealed that most individuals were employed in appropriate industries and occupations, there was some suggestion of mismatch. In particular, there were considerable shares of individuals with HE qualifications employed in occupations – such as service and sales and elementary work – that are not appropriate for individuals who are high-skilled. The spread of employment across industries for those with HE engineering qualifications suggested considerable mismatch for this field in particular. Among TVET graduates, only 4.7 percent of the employed were working in low-skilled occupations in Q2 2019, suggesting that most were employed in appropriate occupations. Signals of possible mismatch can be identified for different fields of study. There was a considerable number of business-qualified individuals from TVET colleges (around one in four) employed in occupations that are not explicitly business-related.

These indications of mismatch highlight the need for the improved placement of individuals with HE and TVET qualifications. This process could be facilitated by the appropriate involvement of employers in educational planning, to ensure that qualification curricula and career pathways are informed by work and skills requirements and that, ultimately, individuals obtain qualifications with a clear path towards appropriate and productive employment.

PART 8

Skills demand and supply: Key findings and recommendations

This chapter provides a high-level summary of the key findings of this report on skills demand and supply in South Africa. The analysis conducted in this report provides fundamental insights that can guide credible skills planning. In order to develop suitable models for skills planning, the challenges of inclusive growth and inclusive development in South Africa – along with the country's developmental policy goals – need to be carefully considered. Crucially, beyond its focus on matching skills demand and supply more effectively, skills planning should also consider structural inequalities based on race, gender, and geographical location, for example.

The recommendations made in this chapter are based on an understanding of skills imbalances that takes into account the challenges of economic growth and the inclusive development requirements of South Africa. It also recognises that skills planning must focus not only on those who are employed but also on those who remain locked out of economic opportunities. Skills planning must explicitly take into account the most vulnerable within society, including the unemployed, the low-skilled, young people, women, and those in precarious forms of employment, such as the self-employed and the informally employed. The challenge is to respond to the country's diverse skills-related needs in a manner that allocates resources optimally and addresses the skills requirements of everyone in the country.

The key findings in this regard are noted below.

1. There is an overarching structural imbalance between the demand for and the supply of skills in the South African economy.

There is a structural mismatch between the demand for skills and the supply of skills. The South African economy can be characterised as one in which there is considerable demand for high-skilled workers but a surplus of low-skilled workers. This implies that, on the supply side, there is a need to enrol and graduate higher numbers of higher education (HE) and technical and vocational education and training (TVET) students in fields of study corresponding to those sectors of the economy that require high-skilled labour.

However, given the high numbers of unemployed individuals, the structural mismatch also suggests that action should be taken on the demand side to increase the overall demand for lower-skilled individuals or to achieve higher levels of growth, which can provide the opportunities needed by the unemployed. Moreover, it is important that future growth be projected adequately and that the educational pipeline respond accordingly, so that those obtaining qualifications today can obtain the skills that will be required in the future.

2. Recognising that supply must respond to demand – and that demand and supply interact to produce the labour market outcomes observed in the country – confirms the critical role of economic growth in addressing the crisis of unemployment within the system of skills demand and supply. This, in turn, highlights the need for improved co-ordination across the different government departments.

While the responsibility of the Department of Higher Education and Training (DHET) and its stakeholders lies firmly on the supply side, a concerted effort throughout all spheres of government is required in order to address South Africa's unemployment crisis. South Africa has a large and growing number of unemployed individuals. The economy should move towards more labour-intensive forms of growth that can absorb the large number of people in search of jobs. To the extent that the country pursues growth in sectors that require higher-skilled labour, this growth should be supported by appropriate skills supply interventions. In this regard, better co-ordination is needed between the different government departments. This co-ordination should include integrating skills development and education more explicitly, and in a more targeted manner, into growth plans and strategies. There are many policies, across all spheres of government, that seek to improve growth and address unemployment. However, there is a need for a standardised and consistent approach that not only targets growth but also takes into account the skills requirements and implications of such strategies.

3. The available data are suggestive of some specific mismatches between demand and supply. One such mismatch involves the considerable increases in unemployment among graduates in particular fields of study. Another is the mismatch between field of study and labour market destination.

Unemployment among individuals with HE qualifications increased at an average rate of 14.4 percent per year between Q2 2013 and Q2 2019, while unemployment among individuals with TVET qualifications grew at an average rate of 10 percent per year over the period. These increases are concerning and suggest that there is insufficient demand for individuals with qualifications in the economy, despite the fact that there are shortages of a considerable number of occupations. They also suggest that the specific qualifications being attained by individuals are not in demand or that the skills obtained through these qualifications are not aligned with the skills needs of employers.

For those with HE qualifications, business, education, and other humanities graduates accounted for 70 percent of the total increase in unemployment between Q2 2013 and Q2 2019. By rate of increase, growth in unemployment has been highest for those with health, education, other humanities, and engineering qualifications. For those with TVET qualifications, the greatest increase in unemployed individuals was seen among business graduates (50.2 percent of the total change in unemployed individuals). Individuals with engineering qualifications accounted for 23.9 percent of the change in unemployed individuals.

With respect to employment mismatch among qualified individuals, for both HE and TVET graduates the analysis revealed that most individuals were employed in appropriate industries and occupations, although there was some suggestion of mismatch. In particular, there were considerable shares of individuals with HE qualifications employed in occupations – such as service and sales and elementary work – that are not appropriate for high-skilled graduates. Among those with TVET qualifications, only 4.7 percent were employed in low-skilled occupations in Q2 2019, suggesting that most were employed in appropriate occupations. Signals of possible mismatch can be identified for different fields of study. For example, a considerable number of individuals with business qualifications from TVET colleges (around one in four) were employed in occupations that are not explicitly business-related.

4. Some progress has been made on transformation in terms of race and gender. However, the patterns of the past still persist to a large degree.

Although access will have to increase further to reach the targets set out in the White Paper on Post-School Education and Training (WPPSET) (DHET, 2013), there have been substantial improvements in access and throughput rates in recent years. In addition, much has been achieved in terms of equity, with previously disadvantaged population groups now constituting more than 85 percent of enrolments in all PSET institutions.

Although on par with other upper-middle-income countries, educational attainment in South Africa remains highly unequal across population groups. Approximately 11 percent of the black African and coloured populations held a post-school qualification in 2017. In comparison, approximately 29 percent and 46 percent of the Asian and white population groups held a post-school qualification. Hence, there remains a need to increase the number of PSET enrolments and graduates in population groups that were historically underserved in order to reduce inequality in educational attainment across population groups.

The number of individuals with university degrees in the economically active population has grown significantly, from under a million in 2008 to 1.6 million in 2017. This constitutes an increase of 8.4 percent per year, on average. Since the black African population had the largest share of degree holders in the total economically active population in 2017, at 54.9 percent, this increase is particularly encouraging. However, black African degree holders account for just 3.2 percent of all economically active black Africans. This proportion was 20.1 percent for the economically active white population group. These figures reflect remaining racial inequalities in terms of university access and graduation levels across different population groups in the economically active population.

Further, while trends point to a larger pool of skilled persons currently entering the labour market than has historically been the case, it is important that these individuals be afforded the opportunity to make use of their qualifications productively, or else they will remain disadvantaged, even with higher levels of educational attainment.

5. While levels of education have been rising over time, the population remains relatively low-skilled. Substantial mismatch between the qualifications obtained and the skills demanded also seems to have resulted in rising graduate unemployment and field-of-study mismatch for the employed. There is much scope for improvement in the education and skills levels of individuals and for better alignment between these factors and the country's skills demand. The education and training sector must take the lead in this regard, but collaboration and co-ordination with other sectors and relevant departments are also important.

The post-school education and training (PSET) sector must improve the education levels of the population, improve the skills of youth in particular, and increase supply in response to the signals of demand identified in the economy in a manner that is inclusive. Importantly, the quality of basic education should be improved. A key constraint to achieving higher levels of education within the PSET system is the inadequate quality of basic education. This is particularly the case in the areas of numeracy and literacy. Improving the skills of the population in these areas will lead to improved outcomes across the educational system.

A further recommendation is to review targets and funding in order to increase the number and share of graduates in fields that exhibit demand. As noted, this process will also require appropriate reforms on the demand side in order to stimulate demand in sectors that are aligned to the stock of qualifications that currently exists. The numbers of unemployed and mismatched business, engineering, and humanities graduates in particular suggest that demand for these graduates must be increased and that supply must react to ensure that other fields of study that are more in demand (such as science) be targeted, so that individuals obtain qualifications that will lead to employment.

6. A process of rapid technological changes, broadly referred to as the Fourth Industrial Revolution (4IR), is expected to lead to changes in the skills demanded by employers. In line with these changes, certain occupations are expected to decline in their importance, while others are expected to become more important. In order to assist in building and maintaining a capable workforce that can respond to the needs of the economy, skills planners must investigate and understand these imminent shifts in demand.

Across sectors and industries, a number of occupations are expected to decline in importance. These are mainly occupations that involve routine tasks that might one day be able to be completed using automation and other types of technology. Occupations that are expected to become more important include those related to management and those related to 4IR-era technological changes. Importantly, however, changes in demand are expected to differ across sectors and industries. Higher education institutes (HEIs) and TVET colleges must thus be able to respond to varied and evolving skills needs.

One way to facilitate this responsiveness and ensure that students obtain skills that are in demand is to forge greater collaboration between businesses (which are at the forefront of changes in their respective industries) and educational institutions. In particular, if the South African economy is to cope with substantial changes in the demand for certain skills as a result of the 4IR, there is a need for interventions on the supply side of the labour market, especially in relation to post-secondary education. Subject curricula will need to be adapted to ensure that students develop competencies in areas such as data science and robotics. Further, a culture of lifelong learning will need to be developed. Individuals should be supported to upskill themselves throughout their working lives. Distance learning may have an important role to play in this regard.

7. Substantial gaps still exist in terms of the intelligence that is publicly available on the demand for and supply skills. This is particularly true of the demand side.

Identifying comprehensive and reliable signals of skills imbalances requires complete and credible data. The analysis in this report has relied on Statistics South Africa's (Stats SA's) Quarterly Labour Force Surveys and the Higher Education Management Information system. With respect to demand, there are substantial intelligence gaps around the skills requirements of employers and employer perceptions of skills demand. A further gap is the lack of comprehensive data on migrants and the skills possessed by those entering the workforce from outside the country and those leaving the South African workforce for other countries.

It should be noted that future Labour Market Intelligence Programme (LMIP) research may address some of these data and knowledge gaps. However, it is important that a system be put in place to collect all the data required for the analysis of skills demand and supply on an ongoing basis. The DHET should work closely with Stats SA and other relevant departments to collect data for skills planning. An essential source of data for skills planning is student tracking and destination studies. A better understanding of the skills requirements for both private and public sector expansion and growth is also important.

In line with these findings, the following recommendations are made:

1. Support integrated skills development and economic growth.

a. **Pursue labour-intensive forms of growth that can address South Africa's unemployment crisis along with appropriate interventions on the supply side**. While the responsibility of the DHET and its stakeholders lies explicitly on the supply side, recognising that supply must respond to demand – and that demand and supply interact to produce the labour market outcomes observed in the country – confirms the role of economic growth in addressing the crisis of unemployment within the system of skills demand and supply. South Africa has a large and growing number of unemployed individuals. The economy should move towards growth that can absorb the large number of people in search of jobs. To the extent that the country pursues growth in sectors that require higher-skilled labour, this growth should be unlocked and amplified through appropriate interventions. It should be ensured that those in the labour force obtain skills that are aligned with the country's growth trajectory.

b. **Improve co-ordination between different government departments**. Economic growth and skills policies should be integrated to ensure that demand and supply are matched in a way that both increases employment opportunities and provides the skills that are required for improved employment prospects. Skills development and education should be considered explicitly and in a targeted manner within growth plans and strategies. There are many policies, across all spheres of government, that seek to improve growth and address unemployment. However, there is a need for a standardised and consistent approach that not only targets growth but also takes into account the skills requirements and implications of such strategies. It is only when the system functions as an integrated whole that large-scale benefits for the country will be seen, both at the macro-level of the economy and at the micro-level of individuals seeking employment.

2. Improve the education and skills levels of the population.

a. **Improve the quality of basic education**. The potential of the PSET system to foster the skills required in a modern economy is constrained by outcomes in the country's schooling system. The large number of individuals not in employment, education, or training (NEETs) is symptomatic of a schooling system that fails to adequately prepare learners for a lacklustre labour market or for further education. Without improvements in schooling outcomes, there will continue to be a limited pool of potential students eligible for PSET. This, in turn, places limits on the potential supply of skills in the labour market.

b. **Expand the provision of community education and training (CET) programmes and enhance the capacity of CET colleges.** A gap in basic skills in particular has been noted by the OECD in its calculation of skills gaps for South Africa. CET colleges may have a role to play in enhancing these skills for individuals who are not currently in the basic education system. However, in order for CET colleges to provide this support, they must themselves be supported in improving their capacity and effectiveness.
c. **Adapt curricula to ensure that students develop competencies in areas that are emerging.** In order for the South African economy to cope with substantial changes in the demand for certain skills as a result of the 4IR, the type of skills obtained by individuals will need to change. This will require a number of interventions on the supply side of the labour market, especially in relation to post-secondary education. These include adapting subject curricula in order to ensure that students develop competencies in emerging areas such as data science, artificial intelligence, and robotics.
d. **Encourage lifelong learning.** Institutions can facilitate lifelong learning by developing relevant online courses, allowing individuals of any age to learn about a particular area of interest. Although online courses do exist in South Africa, the current choices on offer are limited. There is plenty of scope to improve the variety of online courses available.

3. Support high-skilled occupations.

a. **Raise targets for areas for which there is demand.** While unemployment has risen for graduates in all fields, unemployment has risen much faster in certain fields compared to others. Individuals should be encouraged to obtain qualifications in fields in which there are more opportunities for employment. These include business and science. Given the overall increase in unemployment among individuals with qualifications in all fields of study, however, demand for all qualifications should be raised in the long-term through appropriate growth initiatives.
b. **Improve the skills of managers and skilled professionals though appropriate qualifications and ongoing learning.** Demand for managers and professionals is among the fastest growing across occupational groups. It is driven mainly by the dominant financial and business services and CSP services industry. Effective managers and skilled professionals are created not only through appropriate qualifications but also through workplace development. Sectoral Education and Training Authorities (SETAs) can play a particular role in this regard by facilitating continual learning for managers and skilled professionals in the workplace.
c. **Improve the placement and employment of individuals with HE qualifications by promoting a demand-led approach to the attainment of qualifications that facilitates and supports collaboration between employers and HEIs.** Unemployment rates have been rising for individuals with degrees. Employers should be involved in ensuring that qualification curricula and career pathways are informed by work and skills requirements, so that individuals obtain qualifications with a clear path towards productive employment.

4. Support semi-skilled occupations.

a. **Increase TVET certification rates**. Despite improvements in recent years, there continue to be serious quality concerns surrounding TVET and private colleges, with these concerns largely centred on low completion rates. While there have been improvements in certification rates, fully leveraging the potential of the college system to improve the skills of the labour force will require paying further attention to increasing completion rates. This matter is especially pressing for students enrolled in NC(V) Level 4 programmes, whose certification rates improved only marginally between 2016 and 2019 at TVET colleges and declined in private colleges, from 43 percent in 2013 to 31.4 percent in 2016.

b. **Improve the placement of those with TVET qualifications**. While it is difficult to precisely measure mismatch, the employment profile of individuals with TVET qualifications has provided indications of substantial mismatch among these individuals in a number of fields. Specifically, those with TVET qualifications in business and engineering seem to be working in fields that do not seem related to their qualifications.

c. **SETAs should play a more active role in developing intermediate skills**. A substantial share of the workforce have not completed secondary schooling. This group could benefit from upskilling and training, facilitated by SETAs. While enrolments and certifications in learnerships and skills programmes have increased over time, these initiatives still only reach a very small portion of the workforce and there are many more individuals who could benefit from them.

d. **Facilitate the active involvement of business in devising training, skills, and career pathways for TVET students**. TVET colleges should adopt a demand-led approach, whereby businesses are actively involved in ensuring that training, skills, and career pathways are informed by current work and skills requirements. This process would allow TVET students to learn in-demand skills. TVET colleges must adapt to the 4IR and other changes by allowing greater input from businesses, which will be at the forefront of these changes.

5. Strengthen the availability of data for labour market intelligence.

a. **Establish a multi-year programme of regular surveys to probe issues surrounding labour and skills supply and demand**. The particular emphasis of these surveys should be on closing some of the knowledge gaps on the demand side (specifically, the lack of adequate data on employer skills requirements and employer perceptions of skills demand). These surveys need to be institutionalised so that there is clear responsibility for ensuring that they are conducted. Data should be made freely available to the research community for further analysis.

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Appendix

TABLE A.1: Employment by industry and occupation, Q2 2009

		Q2 2009 ('000s)										
		HIGH SKILL			MEDIUM SKILL					LOW SKILL		TOTAL
	INDUSTRY	MANAGERS ('000s)	PROFESSIONALS ('000s)	TECHNICIANS ('000s)	CLERKS ('000s)	SERVICE AND SALES ('000s)	SKILLED AGRICULTURE ('000s)	CRAFT AND RELATED ('000s)	OPERATORS AND ASSEMBLERS ('000s)	ELEMENTARY ('000s)	DOMESTIC ('000s)	('000s)
PRIMARY SECTOR	Agriculture, fishing, and forestry	28.7	2.0	7.5	9.1	10.1	65.6	39.2	68.9	518.2	3.0	752.2
	Mining	11.1	16.5	13.9	22.3	9.8	1.3	121.2	89.7	63.3	0.3	349.5
SECONDARY SECTOR	Manufacturing	141.4	54.4	178.7	154.1	43.6	5.3	573.5	544.6	335.6	0.5	2 031.8
	Electricity, gas, and water (utilities)	8.0	7.0	10.6	12.9	4.2	1.6	25.9	23.7	8.8	0.8	103.6
	Construction	96.0	31.8	51.4	34.1	6.2	2.6	664.1	49.3	271.0	0.5	1 207.2
TERTIARY SECTOR	Wholesale and retail trade	314.4	25.9	125.6	421.6	849.2	2.9	356.3	121.4	934.6	3.7	3 155.5
	Transport, storage, and communication	108.2	19.7	60.8	111.7	25.0	0.6	33.7	301.5	118.3	0	779.5
	Financial and business services	237.4	211.4	310.8	371.6	381.4	2.6	46.6	41.4	248.0	2.3	1 853.7
	CSP services	159.9	341.2	906.4	398.9	570.0	3.5	63.6	49.1	342.2	0.9	2 835.6
	Private households	0.5	0	0.9	0.5	18.8	0.7	8.7	2.8	234.4	1 018.7	267.3
TOTAL ('000s)		**1 105.8**	**709.9**	**1 666.7**	**1 537.1**	**1 918.4**	**86.8**	**1 932.9**	**1 292.5**	**3 076.1**	**1 030.7**	**14 357.0**

Source: QLFS Q2 (Stats SA, 2009)

Notes:
1. A number of domestic workers have been allocated to industries other than private households. It is likely that this is a misspecification of industry.

TABLE A.2: Employment by industry and occupation, Q2 2019

		Q2 2009 ('000s)										
		HIGH SKILL			MEDIUM SKILL					LOW SKILL		TOTAL
	INDUSTRY	MANAGERS ('000s)	PROFESSIONALS ('000s)	TECHNICIANS ('000s)	CLERKS ('000s)	SERVICE AND SALES ('000s)	SKILLED AGRICULTURE ('000s)	CRAFT AND RELATED ('000s)	OPERATORS AND ASSEMBLERS ('000s)	ELEMENTARY ('000s)	DOMESTIC ('000s)	('000s)
PRIMARY SECTOR	Agriculture, fishing, and forestry	24.1	0.4	4.75	10.0	8.0	45.3	15.3	79.7	654.5	0	842.1
	Mining	11.6	3.3	16.7	19.9	7.5	0	103.2	138.0	80.7	0	381.0
SECONDARY SECTOR	Manufacturing	209.1	34.2	141.8	139.3	49.1	1.7	474.5	440.8	299.0	0	1 789.4
	Electricity, gas, and water (utilities)	19.8	6.9	17.4	17.5	2.4	0	33.6	45.8	8.0	0	151.3
	Construction	130.2	10.2	29.4	33.7	4.1	0.9	799.5	40.6	314.0	0	1 362.8
TERTIARY SECTOR	Wholesale and retail trade	349.1	14.8	64.7	458.3	1 025.7	0.3	369.7	97.3	1 048.7	0	3 428.6
	Transport, storage, and communication	175.2	18.6	48.3	157.7	24.4	0	36.9	426.5	93.7	0	982.5
	Financial and business services	329.6	229.1	343.9	394.1	644.8	3.3	102.0	48.0	400.5	0	2 495.2
	CSP services	277.8	522.3	769.4	475.2	906.5	2.3	21.0	67.6	580.5	0	3 622.5
	Private households	0	0	0	0	14.8	0	1.2	0	240.8	994.5	1 251.4
TOTAL ('000s)		**1 527.9**	**839.6**	**1 436.4**	**1 708.0**	**2 687.4**	**53.8**	**1 957.0**	**1 386.4**	**3 720.5**	**994 .5**	**16 312.7**

Source: QLFS Q2 (Stats SA, 2009)

TABLE A.3: Classification of higher education and TVET fields of study using QLFS data

FIELD OF STUDY	BUSINESS, COMMERCE, AND MANAGEMENT STUDIES	SCIENCES	ENGINEERING OR ENGINEERING TECHNOLOGY	HEALTHCARE OR HEALTH SCIENCES	VISUAL OR PERFORMING ARTS	EDUCATION, TRAINING, OR DEVELOPMENT	OTHER HUMANITIES AND SOCIAL SCIENCES	OTHER
1. Agriculture or renewable natural resources		X						
2. Architecture or environmental design			X					
3. Visual or performing arts					X			
4. Business, commerce, and management studies	X							
5. Communication							X	
6. Computer sciences		X						
7. Education, training, or development						X		
8. Engineering or engineering technology			X					
9. Healthcare or health sciences				X				
10. Home economics								X
11. Industrial arts, trades, or technology							X	
12. Languages, linguistics, or literature							X	
13. Law	X							
14. Libraries or museums							X	
15. Life or physical sciences		X						
16. Mathematical sciences		X						
17. Military sciences		X						
18. Philosophy, religion, or theology							X	
19. Physical education or leisure							X	
20. Psychology							X	

FIELD OF STUDY	BUSINESS, COMMERCE, AND MANAGEMENT STUDIES	SCIENCES	ENGINEERING OR ENGINEERING TECHNOLOGY	HEALTHCARE OR HEALTH SCIENCES	VISUAL OR PERFORMING ARTS	EDUCATION, TRAINING, OR DEVELOPMENT	OTHER HUMANITIES AND SOCIAL SCIENCES	OTHER
21. Public administration or social services							X	
22. Social sciences or social studies							X	
23. Other								X
24. Management	X							
25. Marketing	X							
26. Information technology and computer studies			X					
27. Finance, economics, and accounting	X							
28. Office administration	X							
29. Electrical infrastructure construction			X					
30. Civil engineering and building construction			X					
31. Engineering			X					
32. Primary agriculture		X						
33. Hospitality	X							
34. Tourism	X							
35. Safety in society								X
36. Mechatronics			X					
37. Education and development						X		
38. Other								X

Source: Own allocation

TABLE A.4: Employed population with higher education qualifications by field of study and main industry, Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS ('000s)		SCIENCES ('000s)		ENGINEERING ('000s)		HEALTH ('000s)		ARTS ('000s)		EDUCATION ('000s)		OTHER HUMANITIES ('000s)		OTHER ('000s)		TOTAL ('000s)	
	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019
Agriculture	1.5	1.1	1.6	4.6	1.5	0.7	1.7	1.3	0.0	0.0	0.0	0.5	1.1	0.0	6.8	1.3	14.1	9.5
Mining	3.2	6.7	2.3	0.0	6.4	3.1	0.0	0.0	0.0	0.0	1.3	0.0	0.9	0.6	0.7	1.5	14.8	11.8
Manufacturing	35.9	42.5	14.0	9.4	27.5	20.0	5.6	0.5	1.8	2.3	2.3	0.0	10.6	3.5	3.6	9.7	101.3	87.8
Utilities	9.0	7.8	0.0	0.0	12.0	12.1	0.0	0.0	0.0	0.0	0.0	1.2	0.0	2.6	0.0	1.6	21.0	25.3
Construction	6.1	11.7	0.9	4.6	7.8	16.6	0.0	0.0	0.0	0.5	1.1	4.6	1.9	2.4	0.0	1.7	17.7	42.2
Wholesale and retail trade	42.8	43.6	2.7	6.7	10.3	10.6	3.1	3.9	2.9	2.7	2.8	5.2	8.6	11.5	5.2	9.6	78.4	93.7
Transport, storage, and communication	28.4	32.1	3.4	2.5	8.1	10.9	0.0	0.0	1.3	1.7	3.6	1.0	6.8	3.0	2.3	10.0	53.8	61.3
Financial and business services	174.6	249.0	27.4	31.7	46.4	55.2	8.2	2.6	5.0	7.7	4.8	4.7	29.7	36.4	5.0	30.8	301.1	418.1
CSP services	89.9	115.6	28.5	41.3	14.3	25.9	104.5	112.6	9.8	12.5	214.7	301.8	98.4	92.4	25.5	36.9	585.4	738.9
Private households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7
Other/unspecified	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	1.5	0.8	2.9
Total ('000s)	**391.2**	**511.6**	**80.8**	**100.8**	**134.2**	**155.1**	**123.2**	**120.9**	**20.8**	**27.5**	**230.6**	**319.1**	**158.5**	**152.2**	**49.1**	**105.2**	**1 188.4**	**1 492.3**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

TABLE A.5: Employed population with TVET qualifications by field of study and main industry, Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS ('000s)		SCIENCES ('000s)		ENGINEERING ('000s)		HEALTH ('000s)		ARTS ('000s)		EDUCATION ('000s)		OTHER HUMANITIES ('000s)		OTHER ('000s)		TOTAL ('000s)	
	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019
Agriculture	2.2	3.5	13.3	7.9	3.3	0.7	0.7	0.0	0.0	0.0	1.8	0.7	1.0	2.7	0.8	3.2	23.1	18.7
Mining	12.1	13.0	1.4	3.2	37.5	36.3	0.2	0.8	0.0	0.0	0.5	1.8	2.3	2.2	2.1	9.7	56.1	67.0
Manufacturing	81.2	78.6	12.3	7.9	88.0	93.4	4.7	0.9	1.9	3.2	5.3	6.3	16.4	11.9	34.5	55.3	244.2	257.4
Utilities	9.5	3.7	0.0	0.7	21.6	37.8	1.2	3.5	0.0	0.0	0.0	0.0	1.5	2.4	4.5	3.2	38.3	51.3
Construction	12.7	20.7	6.3	2.5	56.8	69.4	3.7	1.7	0.0	0.0	3.2	5.4	8.5	3.2	7.9	21.4	99.1	124.4
Wholesale and retail trade	126.7	128.5	24.7	8.1	60.0	75.1	12.5	10.0	1.1	4.3	9.7	7.5	25.2	13.9	34.4	42.6	294.3	290.1
Transport, storage, and communication	36.8	48.6	4.5	4.7	36.5	34.1	0.8	3.7	0.0	0.0	2.2	6.1	17.4	2.6	15.0	29.1	113.1	128.8
Financial and business services	154.9	166.9	34.3	26.2	84.6	108.5	7.6	11.0	6.0	6.2	8.5	3.2	19.0	15.0	50.7	74.6	365.8	411.6
CSP services	160.1	181.2	36.3	24.2	66.3	60.1	174.9	176.3	6.4	4.9	257.3	255.3	72.5	59.3	72.8	117.9	846.5	879.2
Private households	2.5	0.4	4.6	0.0	1.6	1.6	0.0	1.9	0.0	0.0	1.2	2.7	0.0	0.0	1.2	2.2	11.2	8.8
Other/unspecified	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Total ('000s)	**599.4**	**645.1**	**137.8**	**85.4**	**456.3**	**517.0**	**206.2**	**209.8**	**15.5**	**18.6**	**289.8**	**289.1**	**163.8**	**113.1**	**223.8**	**359.3**	**2 092.4**	**2 237.2**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

TABLE A.6: Employed population with higher education qualifications by field of study and main occupation (one-digit), Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS ('000s)		SCIENCES ('000s)		ENGINEERING ('000s)		HEALTH ('000s)		ARTS ('000s)		EDUCATION ('000s)		OTHER HUMANITIES ('000s)		OTHER ('000s)		TOTAL ('000s)	
	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019
Managers	148.4	198.3	13.5	39.4	37.2	56.2	20.1	8.5	7.2	4.8	15.3	27.7	32.8	40.9	8.4	31.5	282.9	407.4
Professionals	143.6	189.2	41.8	34.0	67.4	61.5	67.2	89.0	5.9	7.1	31.3	221.9	51.1	49.3	10.6	35.8	418.8	687.8
Technicians	51.8	42.8	13.6	15.2	10.7	17.8	32.0	18.1	4.5	5.8	173.6	53.4	35.9	24.5	18.4	12.8	340.3	190.4
Clerks	29.9	50.9	4.3	2.6	0.0	3.2	0.7	1.8	0.6	1.1	5.2	5.2	26.8	28.0	9.6	14.8	77.1	107.6
Service and sales	8.8	18.0	2.9	3.9	0.4	5.2	0.3	2.7	0.6	8.1	2.6	4.8	8.3	5.5	1.7	6.5	25.5	54.8
Skilled agricultural	0.3	1.0	0.5	0.0	0.5	0.0	1.7	0.0	0.0	0.0	0.0	0.5	1.1	0.0	0.4	0.0	4.4	1.5
Craft and related	2.0	1.9	3.2	4.1	12.8	5.3	0.0	0.0	1.5	0.5	0.4	4.7	1.8	0.0	0.0	1.6	21.6	18.1
Operators and assemblers	4.4	7.4	0.0	0.0	5.3	2.5	1.3	0.0	0.0	0.0	1.2	1.0	0.8	0.9	0.0	0.0	12.9	11.8
Elementary	2.2	1.9	1.1	1.7	0.0	3.3	0.0	0.8	0.5	0.0	1.0	0.0	0.0	3.1	0.0	1.5	4.8	12.2
Domestic workers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7
Other/unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ('000s)	**391.2**	**511.6**	**80.8**	**100.8**	**134.2**	**155.1**	**123.2**	**120.9**	**20.8**	**27.5**	**230.6**	**319.1**	**158.5**	**152.2**	**49.1**	**105.2**	**1 188.4**	**1 492.3**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)

TABLE A.7: Employed population with TVET qualifications by field of study and main occupation (one-digit), Q2 2013 and Q2 2019

FIELD OF STUDY	BUSINESS ('000s)		SCIENCES ('000s)		ENGINEERING ('000s)		HEALTH ('000s)		ARTS ('000s)		EDUCATION ('000s)		OTHER HUMANITIES ('000s)		OTHER ('000s)		TOTAL ('000s)	
	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019	Q2 2013	Q2 2019
Managers	161.2	154.3	24.2	18.0	63.3	72.9	8.2	2.9	0.7	2.8	16.4	20.6	25.2	13.5	28.0	58.3	327.2	343.5
Professionals	68.2	27.1	27.9	3.6	82.1	21.7	64.0	11.3	1.6	4.7	13.3	26.7	24.1	8.2	11.7	6.1	293.1	109.5
Technicians	90.1	111.2	22.7	28.5	71.7	124.5	101.9	141.6	8.6	3.8	225.4	187.8	21.4	22.9	36.8	80.1	578.7	700.5
Clerks	180.9	187.3	27.2	12.5	29.3	27.6	11.0	11.7	0.4	3.7	13.6	19.9	44.4	31.4	31.0	54.2	338.0	348.4
Service and sales	51.9	83.7	10.2	10.9	23.0	26.5	16.3	27.7	2.6	1.6	12.7	24.0	29.1	17.3	69.1	86.6	214.9	278.2
Skilled agricultural	0.8	0.8	5.2	2.6	2.5	0.7	0.0	0.0	0.0	0.0	0.6	0.0	0.8	0.6	0.4	1.5	10.3	6.2
Craft and related	8.1	24.1	3.2	4.5	120.4	163.2	1.7	2.6	1.5	1.9	2.9	7.9	8.4	9.2	26.5	35.7	172.7	249.1
Operators and assemblers	12.5	21.1	6.9	2.5	28.2	44.2	1.3	4.6	0.0	0.0	1.8	0.0	8.1	4.2	9.1	20.4	68.0	97.0
Elementary	24.9	35.1	5.5	2.1	34.0	34.1	1.7	5.5	0.0	0.0	1.8	2.2	2.3	5.8	9.8	14.1	80.1	98.8
Domestic workers	0.7	0.4	4.6	0.0	1.6	1.6	0.0	1.9	0.0	0.0	1.2	0.0	0.0	0.0	1.2	2.2	9.4	6.1
Other/unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total ('000s)	**599.4**	**645.1**	**137.8**	**85.4**	**456.3**	**517.0**	**206.2**	**209.8**	**15.5**	**18.6**	**289.8**	**289.1**	**163.8**	**113.1**	**223.8**	**359.3**	**2 092.4**	**2 237.2**

Source: Own calculations, QLFS Q2 (Stats SA, 2013, 2019b)