2022

OECD Skills for Jobs database

Skills Imbalances in the South African Labour Market

Detailed results from the OECD Skills for Jobs database

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Detailed results from the OECD Skills for Jobs database

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PART 1

Understanding skills imbalances

Skills imbalances emerge when the demand for skills and the supply of skills are not well aligned. Imbalances generally take three forms:

- **Shortages:** When the demand for a certain skill exceeds supply, employers will have difficulties hiring workers with the right skills.
- **Surpluses:** When the supply of a certain skill is higher than the demand for it, individuals with that skill might have difficulties finding a job in which they can use that skill.
- **Mismatch:** When individuals are employed in a job that does not match their skills profile, they are mismatched to their job.

As such, the emergence of imbalances can be driven by factors related to both supply and demand. In terms of supply-related factors, imbalances can be the result of a generally low availability of labour or of available labour not having the skills that correspond with what employers need. For instance, the workforce might be shrinking in rural areas as a result of migration towards urban centres, or the education and training system might not be supplying enough skilled graduates or might be delivering graduates with skills that do not correspond with employers' needs. With regards to demand-related factors, skills imbalances can be the result of economic downturns and upswings but also of fast changes in skill demand, which may be difficult for the supply of skills to keep up with.

Global megatrends such as technological progress, globalisation and population ageing have changed the demand for and supply of skills in recent decades. Technological progress, for example, has resulted in the automation of routine-intensive tasks, leading to a reduced demand for labour specialising in these tasks. At the same time, the demand for high-level non-routine cognitive and social intelligence skills has increased because of technological progress, and new jobs that require this set of skills have emerged.

In light of the changing skill needs in the labour market, sound information on current and future skill needs is a prerequisite for tackling skills imbalances. The OECD (Organisation for Economic Co-operation and Development) Skills for Jobs database provides information on skills mismatch, shortages and surpluses across OECD and selected non-OECD countries (see Part 2). The goal of this report is to further extend the Skills for Jobs analysis for South Africa. While South Africa is one of the many countries for which the Skills for Jobs data are available, this report provides more detailed results and a full description of the methodology used specifically for the South African data. The next part provides a general overview of the Skills for Jobs database. Part 3 describes the data and methodology used to calculate the indicators for South Africa. The results of the analysis for South Africa are described in Parts 4 and 5.

PART 2

The Skills for Jobs database

The OECD Skills for Jobs database, first published in 2017 and updated in 2019, provides information on skills imbalances for OECD countries and a selection of non-OECD countries. The database consists of two sets of indicators. The first set, the skill needs indicators, includes measures of shortage and surplus by country and year. The second set, the mismatch indicators, includes measures of qualification and field-of-study mismatch across countries.

As described in OECD (2017a), the skill needs indicators measure shortages and surpluses using a set of five sub-indicators that are calculated at the occupational level (Figure 2.1). Three sub-indicators are related to employment pressure, one to wage pressure and the other to talent pressure. These sub-indicators are compared to the country-wide values of the indicators to extract signals of occupational pressure. The five sub-indicators are:

- **Total employment growth**: When employment in an occupation grows faster than economy-wide employment, this signals that demand for that occupation is strong, which could result in shortages. In the opposite case, when employment in an occupation grows slower than economy-wide employment, this means that demand is weak, which could result in surpluses.
- **Hours worked growth**: When employers have difficulties hiring individuals with the right skills, they might increase the working time of employees. Therefore, if the growth of hours worked in an occupation is stronger than economy-wide growth of hours worked, this could signal shortages. In the opposite case, when hours worked in an occupation grow slower than economy-wide hours worked, this could signal surpluses.
- **Unemployment rate:** When the unemployment rate in an occupation is high, it shows that a large pool of labour is available. Above average unemployment rates could therefore be a signal of occupational surpluses, while below average unemployment rates could signal surpluses in certain occupations.
- **Hourly wage growth**: Employers who face hiring difficulties might increase hourly wages to attract workers with the right skills. Therefore, if the growth of hourly wages in an occupation is above economy-wide wage growth, this could signal shortages. In the opposite case, when hourly wage growth in an occupation is lower than economy-wide wage growth, this could signal surpluses.
- **Change in underqualification**: Employers who face difficulties finding workers with the right skills might resort to hiring workers who are underqualified for the job (i.e., their qualification level is lower than what would usually be required in that occupation). Occupations in which the share of underqualified workers increases faster than the economy-wide share could be showing signs of shortages, while the opposite holds true for occupations where the change in the share of underqualified workers is lower than across the economy.[1]

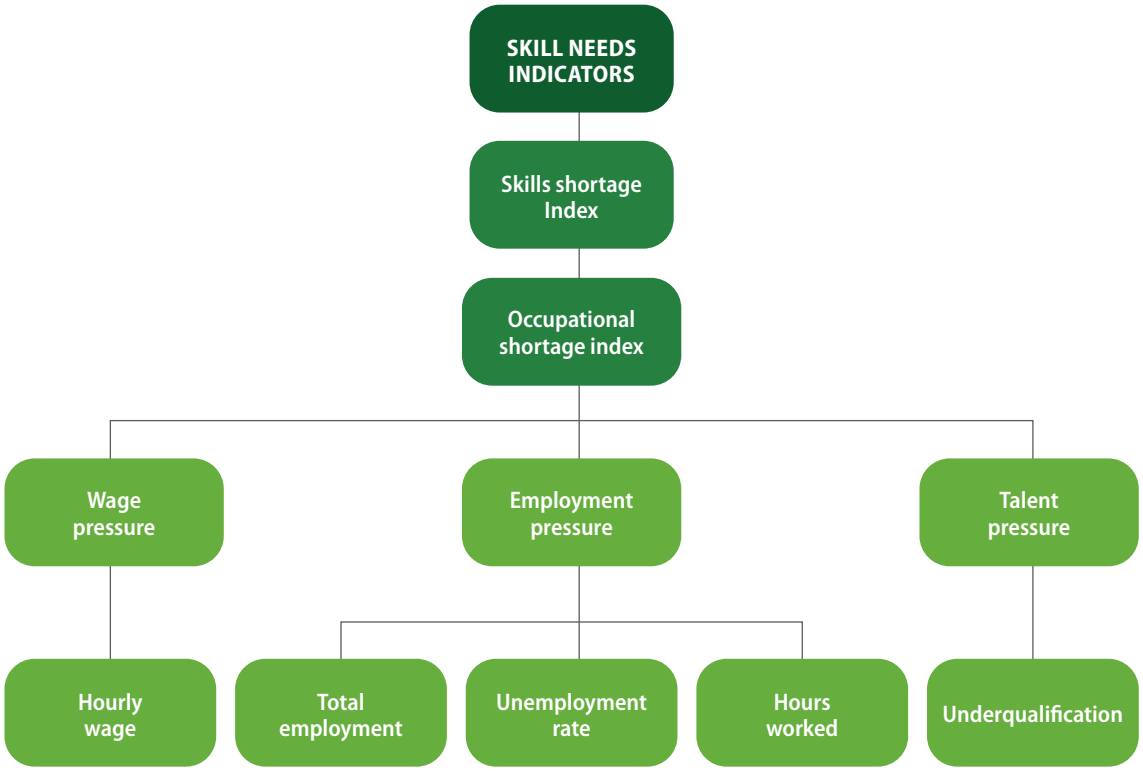
The composite indicator provides a holistic interpretation of skills imbalances in the labour market, rather than focusing on the impact of each sub-index independently.

In a second step, the results from the occupational shortage index are used to map skill requirements to each occupation in shortage/surplus. To do so, the occupation-skills taxonomy developed by O*NET, which identifies detailed skill requirements associated with each occupation, is used. Therefore, the skill needs indicators provide information on both occupational and skill shortages/surpluses in a comparable manner across countries. Information is provided at the two-digit International Standard Classification of Occupations (ISCO) occupation level, as well as disaggregated into several skills

1 The underqualification indicator is not used for occupations in which underqualification is equal to zero in all years. An underqualification rate that consistently equals zero signals that it is impossible to be underqualified in these occupations, making underqualification inadequate as a signal of talent pressure. Underqualification can be impossible for two main reasons: (i) the education level required in the occupation is the lowest one (e.g., in elementary occupations), and (ii) the occupation is very strict about its entry requirements in terms of qualifications (e.g., for medical doctors).

dimensions. Looking at the skill-level results, Figure 2.2 shows that in most OECD countries, there is a shortage of social and problem-solving skills, with the largest shortages observed for the latter skill group (latest comparative data from the online OECD Skills for Jobs database). The picture for technical skills is more mixed but most OECD countries have surpluses or very small shortages of technical skills.

FIGURE 2.1: The structure of the skill needs indicators

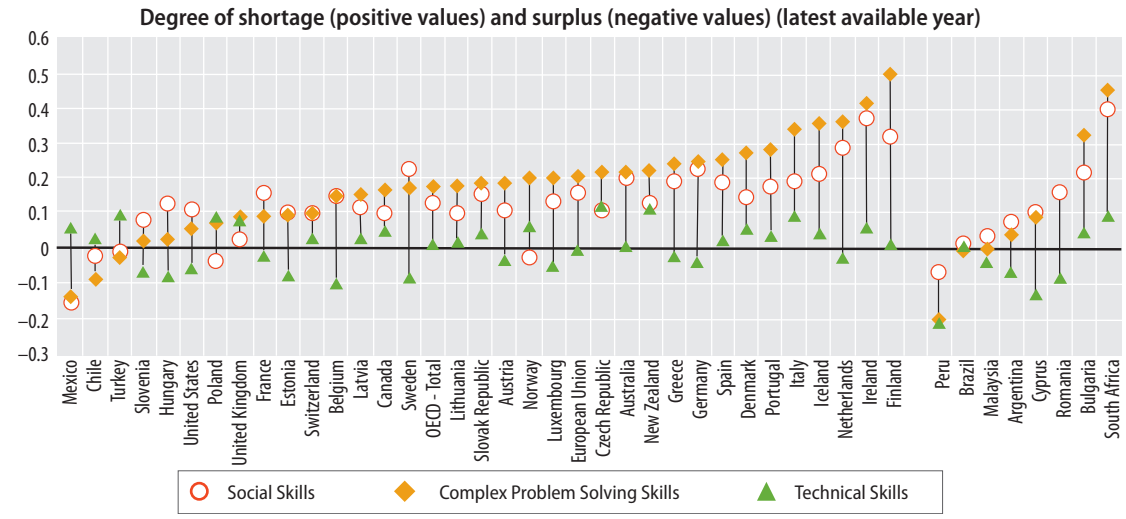


Source: OECD (2017a).

The mismatch indicators compare workers' qualification level and field of study with the level and field usually required in the occupation the worker is employed.[2] The qualification mismatch index calculates the share of workers that is under or overqualified to perform a certain job. This is done by computing the modal (i.e., most common) educational attainment level for each occupation in each country and using this as a benchmark to measure whether individual worker's qualifications match the 'normal' education requirement of the occupation. Field-of-study mismatch is calculated following Montt's (2015) methodology, which assumes that certain fields of study (International Standard Classification of Education [ISCED]) prepare workers to participate in certain occupations (ISCO). As a result, individuals are considered well-matched if they work in an occupation that is considered a good fit for their field of study and mismatched otherwise. Figure 2.3 shows the incidence of the two types of mismatch by country (latest comparative data from the online OECD Skills for Jobs database).

2 In addition to field-of-study and qualification mismatch, it is also possible to measure mismatch in terms of specific skills. Using the Programme for the International Assessment of Adult Competencies (PIAAC) data, for example, Pellizzari and Fichen (2017) and OECD (2019a) measure the mismatch between an individual's numeracy and literacy skill proficiency, and the proficiency generally required in the occupation. No skills proficiency data are available for South Africa to calculate skill mismatch.

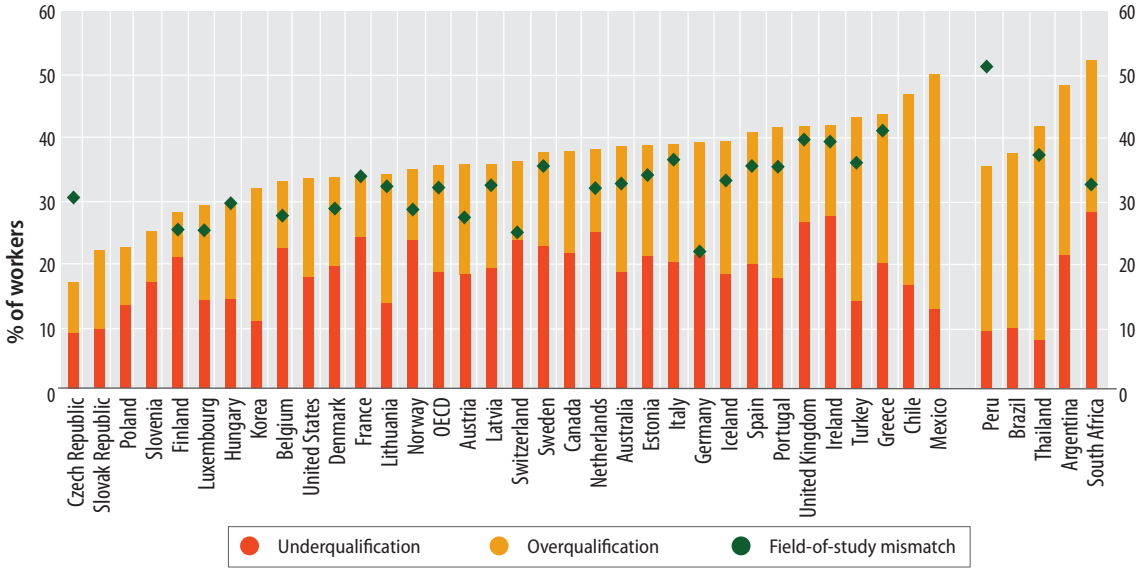
FIGURE 2.2: Skill needs indicators for selected skill groups, by country



Source: OECD Skills for Jobs database (2018).

Note: Results are presented on a scale ranging from −1 to +1. The maximum value represents the strongest shortage observed across OECD countries and skills.

FIGURE 2.3: Qualification and field-of-study mismatch, by country



Source: OECD Skills for Jobs database (2018).

Note: Only includes workers younger than 35 years old, in the case of field-of-study mismatch.

PART 3

Data and methodology for South African results

3.1. South African Labour Force Survey

To calculate the Skills for Jobs indicators for South Africa, the South African Labour Force Survey (SA-LFS) is used for the years 2008–2019 for the skill needs indicators and the year 2020 for the mismatch indicators.[3] The SA-LFS is a household survey that collects information from a representative sample of individuals on a quarterly basis. It is used for two datasets: the Quarterly Labour Force Survey (QLFS) and the Labour Market Dynamics Survey (LMDS). Consistent information is available from 2008 onwards. Table 3.1 gives an overview of the sample sizes in the different years of the survey.[4]

TABLE 3.1: Sample size of the South African Labour Force Survey, by year

Number of observations per year

YEAR	TOTAL	EMPLOYED		UNEMPLOYED AND DISCOURAGED	
		All	Non-missing occupation and wage	All	Non-missing previous occupation
2008	255 140	99 706	0	39 302	20 973
2009	244 830	90 780	0	39 825	21 128
2010	235 979	82 739	81 947	41 654	21 132
2011	230 178	81 005	80 254	41 245	19 579
2012	235 912	84 053	80 074	43 337	21 157
2013	239 476	86 989	77 345	43 911	22 553
2014	234 907	85 375	76 945	44 071	22 253
2015	197 851	76 489	68 357	38 792	20 777
2016	191 221	72 869	62 334	38 406	19 922
2017	191 020	73 492	62 337	39 690	20 430
2018	190 551	73 121	61 365	40 225	19 728
2019	188 623	71 063	59 272	41 302	19 157

Source: Authors' calculation based on the LMDS.

Note: No wage data available in 2008 and 2009. Only includes individuals aged 15 and over.

3 Only the annual labour force data (i.e., the LMDS) contains wage data, which is necessary to calculate the skill needs indicators. Therefore, the skill needs indicators make use of the annual data, which at the time of writing was available up until 2019, while the mismatch data make use of the more recent quarterly data.

4 To maximise the sample size for the analysis, some gaps in occupations and wages have been filled. This has been done by setting the occupation equal to the occupation in the previous quarter (or to the occupation in the next quarter, when no information on the previous quarter is available). Wage gaps are filled by setting an individual's wage equal to his or her average wage observed in at least two quarters (conditional on remaining employed in the same occupation). For individuals only reporting wage brackets, the median wage observed in that wage bracket is attributed.

3.2 Occupational shortage index

As discussed in the previous section, five sub-indicators are used to calculate the occupational shortage index: employment growth, hours worked growth, total unemployment rate, hourly wage growth and change in underqualification.[5] Short-term cyclical changes and changes driven by data volatility are not of interest for the shortage index, while the long-run trends are. The time series of the five sub-indicators (in levels) are therefore smoothed using the Hodrick-Prescott filter. This filter takes out short-term fluctuations from the time series. The data from the filtered series, which capture the long-run behaviour of each series, are then compared to the economy-wide average and aggregated to arrive at the occupational shortage index. The detailed steps to calculate the index are:

Step 1:

Calculate the five sub-indicators in levels for each four-digit occupation: employment, average hours worked, unemployment rate, median hourly wages and share of underqualified workers. Unemployment by occupation is calculated based on the reported previous occupation of the individual. As the unemployment rate provides labour market pressure signals in the opposite direction of the other sub-indicators (i.e., higher unemployment signals surpluses, while higher values on the other sub-indicators signal shortages), the unemployment rate is transformed into its complement (i.e., one minus the unemployment rate).

Step 2:

Apply the Hodrick-Prescott filter to the five series.

Step 3:

Calculate the annual growth rates for the filtered employment, hours worked and hourly wage series, as well as the percentage point changes for the filtered underqualification series.[6]

Step 4:

Calculate the economy-wide average for the employment growth, hours worked growth, total unemployment rate (complement), hourly wage growth and change in underqualification series. Similarly, calculate for each series the country-level standard deviation.[7]

Step 5:

Subtract the country average from each occupation-level sub-indicator and divide the difference by the associated standard deviation.[8]

Step 6:

Aggregate the five sub-indicators through a weighted average.[9]

5 As mentioned in the previous section, underqualification is excluded from the indicators in certain cases. In addition, for the South African analysis, underqualification is discarded for occupations that experienced a large change in underqualification in 2015 or 2016 (at least equal to 7.5 percentage points), as these series are judged to be unreliable.

6 While in principle the indicators could be calculated with only two years of observations (as the indicators use annual growth rates), a longer time series is needed to be able to focus on long-term trends and filter out short-term fluctuations.

7 Both the average and standard deviation are calculated for all series using employment weights.

8 The values of the standardised indicators are capped at −2.5 and 2.5.

9 All indicators are given equal weight, except for the employment growth indicator, which only gets half of the weight of the others. See OECD (2017a) for more details on the rationale for the weighting structure.

The final aggregated occupational shortage index indicates the degree of surplus or shortage of the occupations. Positive values signal shortages and negative values signal surpluses. The larger the absolute value of the index, the bigger the imbalance.

Occupations in the SA-LFS are coded using the South African Standard Classification of Occupations (SASCO). This classification is based on the 1988 version of the International Standard Classification of Occupations (ISCO-88). However, in policymaking, the Organising Framework of Occupations (OFO), which is based on the ISCO-08 (2008) classification, is more commonly used. To guarantee that the results from the Skills for Jobs analysis are as useful as possible for policymakers, the occupations in the SA-LFS are reclassified from SASCO into OFO (at the four-digit level of both classifications). This is done using the existing crosswalk between ISCO-88 and ISCO-08 (from the International Labour Organization [ILO]).[10] SASCO occupations that are not available in the ISCO-88 classification are attributed to the most similar ISCO-88 occupation. The same strategy is applied for OFO occupations that are not available in the ISCO-08 classification. The crosswalk between ISCO-88 and ISCO-08 is not one-to-one, meaning that one ISCO-88 occupation can be mapped onto multiple ISCO-08 occupations. This makes the reclassification challenging, as there is no information on how employment in a certain ISCO-88 occupation is split over the multiple associated ISCO-08 occupations.[11] As a solution to this problem, the assumption is made that employment is split equally over the different associated occupations.

For data at the occupational level to be meaningful, a sufficient number of observations needs to be available. While some four-digit OFO occupations have many observations in the SA-LFS, others have just a handful of data points. To ensure reliability and stability of the occupational data, occupations with less than 20 observations are merged with similar occupations. After this merging of small occupations, the total number of occupations equals 262.

It is important to note that the Skills for Jobs occupational shortage index measures shortages (and surpluses) and is therefore not necessarily the same as measuring occupations in high demand (OIHD).[12] Certain occupations can experience high demand without being in shortage. This is the case when the supply of adequately skilled labour is sufficient to match the high demand.

3.3 Industry-level aggregation

Industries differ in terms of their occupational composition. This implies that industries also differ in terms of their average occupational shortage index. Some industries will employ workers that are in shortage occupations more intensively than others, resulting in stronger overall shortages in the sector. To calculate the shortage index at the industry level, the weighted average of the occupational shortage index is calculated using employment shares as weights:

10 For more information on the ISCO classification and the crosswalk between the 1988 and 2008 version, consult the dedicated webpage: http://www.ilo.org/public/english/bureau/stat/isco/.

11 When the SA-LFS starts collecting occupational information at the ISCO-08 level (or a classification based on ISCO-08), it could be interesting to collect in one year information on both the SASCO (i.e., ISCO-88) occupations of individuals and the ISCO-08 occupations. This would allow having approximate information on how employment in SASCO occupations splits over multiple ISCO-08 occupations.

12 The South African Department of Higher Education and Training (DHET) provides information on which occupations are experiencing high demand in its *List of occupations in high demand*. The methodology to calculate these occupations uses labour market data (e.g., vacancy growth, wage growth) but also takes into account national priorities that will generate significant employment growth in certain occupations. For more details on the methodology, see Reddy, Rogan, Mncwango and Chabane (2018).

$$IS_{c,t,i} = \sum_{j} \frac{E_{c,t,i,j}}{\sum_{j} E_{c,t,i,j}} OS_{c,t,j}$$

Where $IS_{c,t,i}$ is the industry-level shortage index in country c, year t and industry i. The occupational shortage index, $OS_{c,t,j}$ is calculated for each occupation j, as described in the previous subsection. The occupational shortage index is weighted by employment in occupation j in industry i ($E_{c,t,i,j}$) relative to total employment in industry i.

The employment shares are calculated from the SA-LFS, which has information on both the occupation and industry in which an individual is employed. The detailed industry classification from the SA-LFS is grouped into 21 broad industries[13], in line with the SETA groupings (see Table 3.2).

TABLE 3.2: Industries and related SETAs

INDUSTRY	RELATED SETA
Agriculture	AgriSETA
Mining	MQA
Manufacturing, engineering and related services	merSETA
Food and beverage manufacturing	FoodBev SETA
Chemical manufacturing	CHIETA
Fibre processing and manufacturing	FP&M SETA
Energy and water	EWSETA
Construction	CETA
Wholesale and retail	W&RSETA
Transport	TETA
Media, information and communication technologies	MICT SETA
Banking	BANKSETA
Insurance	Inseta
Finance and accounting services	Fasset
Local government	LGSETA
Public service	PSETA
Safety and security	SASSETA
Education, training and development practices	ETDP SETA
Health and welfare	HWSETA
Culture, arts, tourism, hospitality and sport	CATHSSETA
Services	SSETA

13 The official information on Standard Industrial Classification (SIC) codes per SETA is at the detailed four-digit industry level, while the SA-LFS only has information at the broader three-digit level. Whenever three-digit SIC codes correspond to multiple SETAs, the most commonly associated SETA is used for the mapping.

3.4 Skills shortages

The information on shortages and surpluses at the occupational level can be used to calculate shortages or surpluses at the industry level, as well as at the skill level. Several databases provide detailed mapping of occupations and the skills they use or require. Among the different options available, the most suitable and comprehensive database to translate the occupational shortage index into skills shortage indicators is the O*NET database from the United States. This database contains information on the importance and level of a range of skills, abilities and knowledge areas for each detailed occupation[14]. Box 3.1 provides information on the different dimensions of the O*NET database. The assumption is made that occupations in South Africa require the same skills, abilities and knowledge as those in the United States.

Box 3.1 O*NET dimensions

The O*NET database contains information for occupations on a range of dimensions related to worker characteristics, worker requirements, experience requirements, occupational requirements, workforce characteristics and occupation-specific information. The following dimensions are used in the OECD Skills for Jobs database:

- **Abilities** (52 categories): enduring attributes of the individual that influence performance (e.g., originality, depth perception, finger dexterity).
- **Knowledge** areas (33 categories): organised sets of principles and facts applying in general domains (e.g., business and management, engineering and technology, mathematics and science).
- **Skills** (35 categories): developed capacities that facilitate learning or performance, including basic skills (e.g., active listening, writing, critical thinking) and cross-functional skills (e.g., negotiation, programming, time management).

As an example, mathematics knowledge is defined as 'knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications'. Mathematics skills, on the other hand, are defined as 'using mathematics to solve problems' and mathematical reasoning ability as 'the ability to choose the right mathematical methods or formulas to solve a problem'.

While occupational analysts provide information on skills and abilities, information on knowledge is obtained from job incumbents.

Each knowledge, skill and ability dimension in O*NET is codified by assigning categorical values to their 'importance' for the job and 'level' by which the dimension is used. Respondents indicate the importance of a given skill for their job on a scale from 1 (not important) to 5 (extremely important) and the level of the skill needed for their job on a scale from 0–7. Although some analysts found both measures to be very strongly correlated (Peterson, Mumford, Borman, Jeanneret and Fleishmann: 1999; Handel: 2016), there could potentially be substantial differences in the level of similarly important skills. The O*NET website exemplifies the skill 'speaking', which is important for both lawyers and paralegals. However, lawyers (who frequently argue cases before judges and juries) are required to have a higher 'level' of speaking skills, while paralegals only need an average 'level' of this skill.

Source: OECD (2017a).

14 The classification of O*NET occupations is based on the Standard Occupational Classification (SOC) but further disaggregates some of the four-digit SOC occupations. In order to put the occupational shortage index from the Skills for Jobs methodology together with the O*NET information, the O*NET occupations are mapped onto ISCO-08 occupations. In a first step, the more detailed O*NET occupations are reclassified into SOC occupations. When multiple O*NET occupations are available per four-digit SOC occupations, average values of the O*NET variables (level and importance) are calculated. To move from SOC to ISCO-08, the official crosswalk between the two classifications is used (from the ILO). This is not a one-to-one crosswalk and the assumption is made that for a SOC occupation that maps onto multiple ISCO-08 occupations, employment is spread equally over these ISCO-08 occupations. United States employment data is used for these calculations.

To translate the occupational shortage index into skill needs indicators, the occupational shortage index is multiplied by the level and importance of each required skill in the O*NET database. The product of the two dimensions is used as a measure of the skill intensity of the occupation. These values are normalised through min-max scaling. In a next step, the occupation-skill numbers are aggregated at the country level by taking employment weighted averages across occupations. The final skill needs indicators provide an indication of the degree of shortage (positive values) and surplus (negative values) for each skill, ability and knowledge area documented in O*NET.

Using the same methodology, the skill needs indicators can also be calculated at the industry level. In this case the product of the occupational shortage index and the O*NET skill requirements is aggregated at the country-industry level, using employment data per occupation and industry.

PART 4

Skill needs results

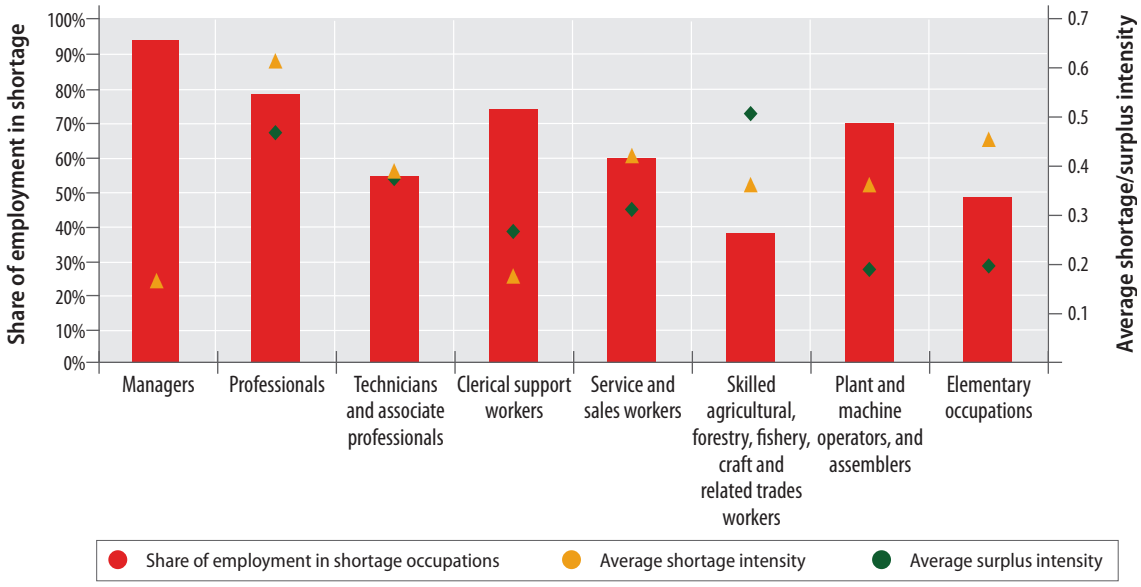
4.1 Skill needs at the occupational level

Applying the Skills for Jobs methodology to the SA-LFS data generates information on shortages and surpluses at the occupational level. For each occupation, the occupational shortage index indicates whether the occupation is in shortage (positive values) or surplus (negative values) and how strong the shortage or surplus is (larger absolute values indicate larger shortages or surpluses).

Figure 4.1 shows the following for each large group of occupations (combining multiple detailed occupations): i) the share of employment that is in shortage occupations (i.e., the occupations with a positive occupational shortage index), and ii) the intensity of shortages and surpluses across all occupations in that group (i.e., the value of the occupational shortage index for occupations in shortage or surplus, respectively). While the former shows how many of the jobs are in shortage and surplus, the latter gives an idea of how strong the shortages and surpluses are. In some occupational groups, a lot of jobs might be in shortage but the intensity of the shortages might be small. In other occupational groups, it could be the case that only few jobs are in shortage but these shortages are very intense.

The vertical bars in Figure 4.1 show that almost all management jobs are in shortage, and more than 70% of professionals and clerical support workers are employed in shortage occupations. Shortages are least common among elementary occupations. When looking at the intensity of the shortages, Figure 4.1 shows that the shortage occupations in the groups of professionals, and agricultural and related trades workers have the strongest shortage intensity. At the same time, the surplus occupations in the professionals group also face relatively intense surpluses. Shortages are least intense among elementary occupations, and plant and machine operators and assemblers.

FIGURE 4.1: Shortages and surpluses per occupational group, 2019



Source: OECD Skills for Jobs database using the LMDS (2008–2019).

Note: The average shortage intensity is the average of the occupational shortage index among shortage occupations. The average surplus intensity is the average of the absolute value of the occupational shortage index among surplus occupations.

Looking at the more detailed occupational results in Table 4.1, the occupations with the largest shortages are generally in the professionals group (e.g., pharmacists, secondary education teachers) and in skilled agricultural and forestry jobs (e.g., poultry producers, forestry workers), as well as in some technical and crafts occupations (e.g., shoemakers, pre-press technicians). The largest surpluses are found mainly in service and sales occupations (e.g., salesperson, firefighter) but also in technicians and associate professionals jobs (e.g., musicians, social work associate professionals). The results show that shortages and surpluses are found at all levels in the National Qualifications Framework (NQF).[15]

TABLE 4.1: Top detailed shortage and surplus occupations, 2019

NQF 1–2	NQF 3–5	NQF 6	NQF 7–10
TOP 20 SHORTAGE		TOP 20 SURPLUS	
Education Methods Specialists		Firefighters	
Forestry and Related Workers		Civil Engineering Labourers	
Shoemakers and Related Workers		Musicians, Singers, Composers, Dancers and Choreographers	
Physicists, Astronomers, Meteorologists, Chemists, Geologists, Geophysicists, Mathematicians, Actuaries and Statisticians		Metal Processing Plant Operators; Metal Finishing, Plating and Coating Machine Operators	
Pharmacists		Toolmakers, Blacksmiths, Hammersmiths, Forging Press Workers and Related Workers	
Elementary Workers not Elsewhere Classified		Filing, Copying, Coding, Proofreading and Related Clerks; Scribes and Related Workers	
Electronics Mechanics and Servicers		Process Control Technicians not Elsewhere Classified	
Mechanical, Industrial, Production and Mining Engineers; Metallurgists and Related Professionals		Meter Readers and Vending-machine Collectors	
Garment and Related Patternmakers and Cutters; Sewing, Embroidery and Related Workers		Accounting, Statistical, Mathematical and Related Associate Professionals; Valuers and Loss Assessors	
Secondary or Intermediate and Senior Education Teachers		Painters and Related Workers	
Managing Directors and Chief Executives		Contact Centre Salespersons	
Tree and Shrub Crop Growers		Door-to-door Salesperson	
Poultry Producers		Journalists, Authors, Translators, Interpreters and Other Writers and Linguists	
Precision-instrument Makers and Repairers; Musical Instrument Makers and Tuners; Jewellery and Precious Metal Workers; Glass Makers, Cutters, Grinders and Finishers		Building and Landscape Architects, Town and Traffic Planners, Cartographers and Surveyors	
Pre-press Technicians		Travel Attendants, Travel Stewards, Travel Guides and Transport Conductors	

15 According to the DHET (2013), managers require a NQF level 6–10 qualification; professionals a NQF level 7–10 qualification; technicians and associate professionals a NQF level 6 qualification; clerical support workers, service and sales workers, skilled agricultural, forestry, fishery, craft and related trades workers, and plant and machine operators and assemblers a NQF level 3–5 qualification; and elementary occupations a NQF level 1–2 qualification.

NQF 1–2	NQF 3–5	NQF 6	NQF 7–10

TOP 20 SHORTAGE	TOP 20 SURPLUS
Education and Childcare Managers	Customs and Border Inspectors; Government Tax and Excise, Social Benefits and Licensing Officials
Fishery Workers, Hunters and Trappers	Social Work and Religious Associate Professionals
Database and Network Professionals	Food and Related Products Machine Operators
Product and Garment Designers	Film, Stage and Related Directors and Producers; Actors; Announcers On Radio, Television and Other Media
Graphic and Multimedia Designers	Building Construction Labourers

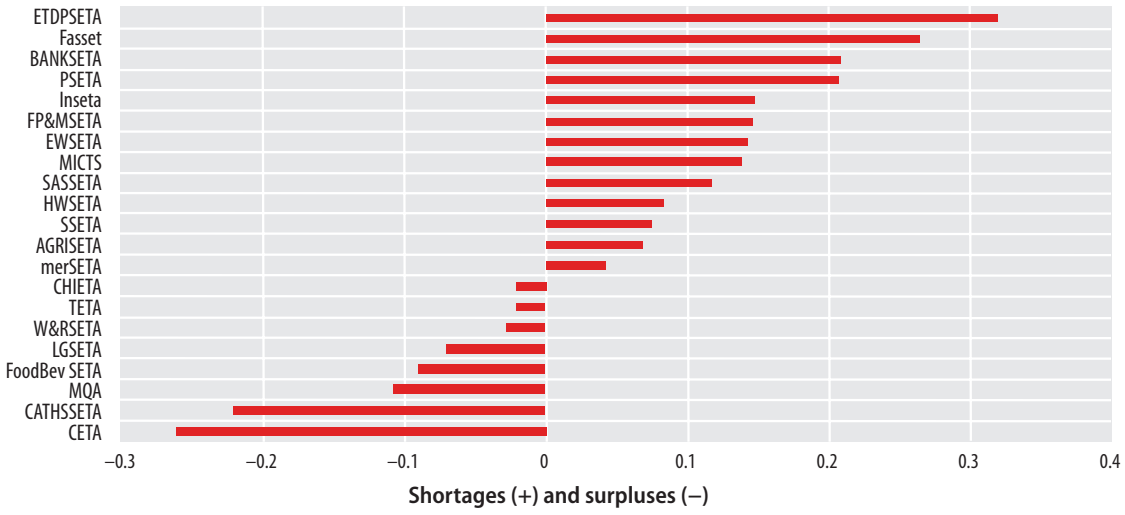
Source: OECD Skills for Jobs database using the LMDS (2008–2019).

Note: The correspondence between OFO occupations and NQF levels is based on information from the DHET (2013). Legislators can be categorised into the NQF 6 and NQF 7–10 groups.

4.2 Skill needs at the industry level

Aggregating the occupational shortage index at the industry level results in a shortage index by industry. Figure 4.2 shows the ranking of the industries (positive values are shortages; negative values are surpluses). The industry that faces the strongest shortages is the education, training and development practices industry, followed by the finance and accounting services industry. By contrast, surpluses are on average most intense in the construction industry, and the culture, arts, tourism, hospitality and sport industry. The industries showing the lowest imbalances on average are chemical manufacturing and transport.

FIGURE 4.2: Shortage index by industry, 2019



Source: OECD Skills for Jobs database using the LMDS (2008–2019).

4.3 Skill needs at the skill level

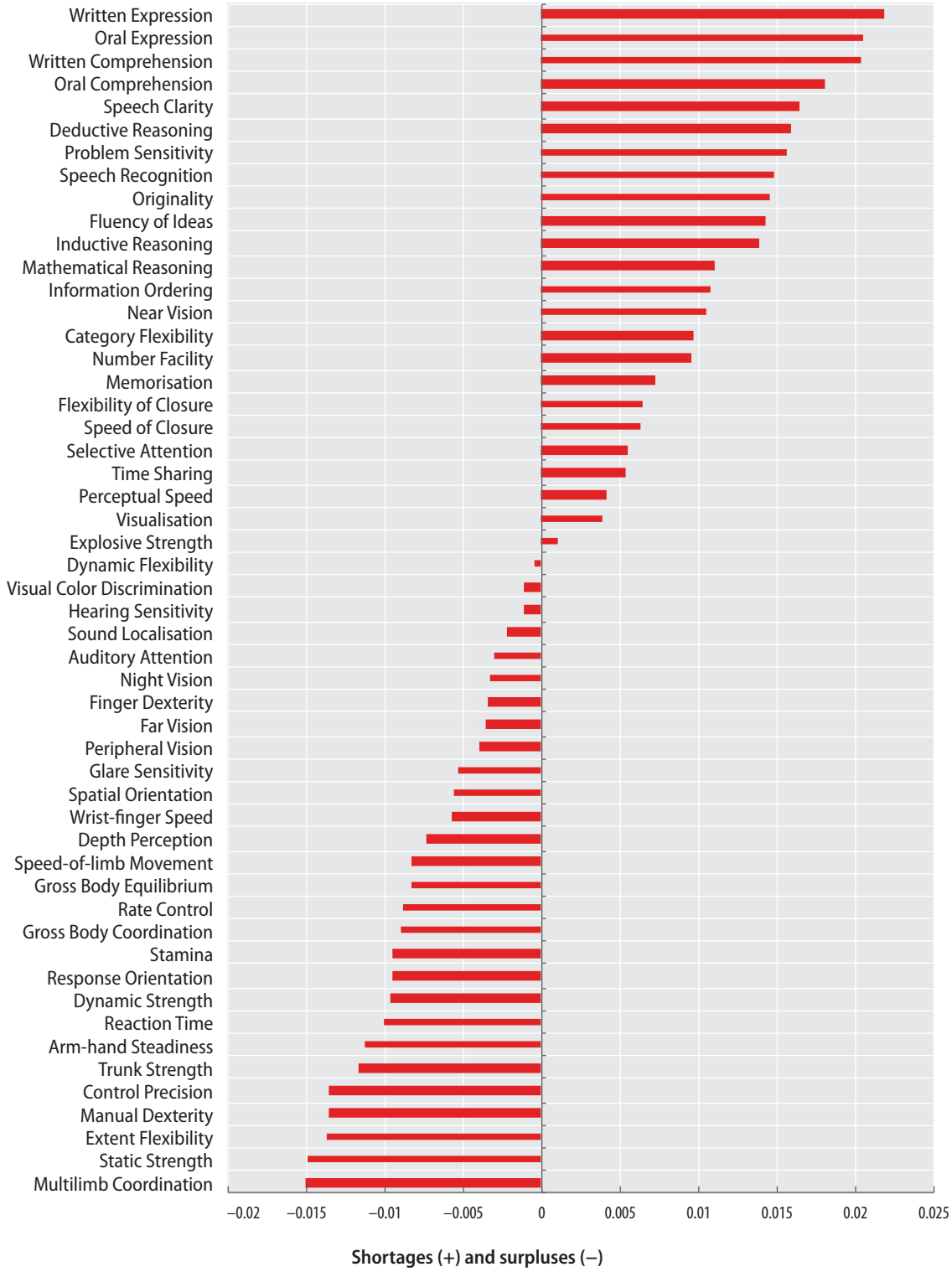
Using information on skills requirements per occupation from O*NET, the occupational shortage index can be aggregated to the skill level. When interpreting the results at the skill level, it is important to note that skills are generally used across many different occupations, albeit at different intensities. Administration knowledge, for example, is not only used intensively in clerical occupations but in many different occupations, including by managers and teachers. Foundational skills, like written and oral expression and comprehension, are used in all occupations but more intensively so in higher-skill occupations.

Figure 4.3 shows the skills shortage index for skills and knowledge types. The largest skills shortages are found for reading comprehension, writing, speaking, active listening and critical thinking. Knowledge shortages are strongest for computers and electronics, clerical, and administration and management knowledge. At the other end of the spectrum, surpluses are found for more technical and manual skills, like repairing, equipment maintenance, and operation and control. Similarly, knowledge areas such as building and construction, and mechanical knowledge face surpluses. A similar picture emerges for abilities (Figure 4.4): cognitive abilities, such as written and oral expression and comprehension, and deductive reasoning, are found to be in shortage, while manual abilities, multilimb coordination and static strength are in surplus.

FIGURE 4.3: Skill shortage index for skills and knowledge types, 2019

Source: OECD Skills for Jobs database using the LMDS (2008–2019).

FIGURE 4.4: Skill shortage index for abilities, 2019



Source: OECD Skills for Jobs database using the LMDS (2008–2019).

The skills results cannot only be calculated at the aggregate level but also by industry. Table 4.2 shows the skills, knowledge areas and abilities most in shortage in each industry. This summary table masks large differences in shortage intensity between industries. For example, the shortage of education and training knowledge for the education, training and development practices sector is much stronger than the shortage of economics and accounting knowledge in the mining sector.

TABLE 4.2: Largest skill shortages, by industry

	SKILLS	KNOWLEDGE	ABILITIES
AgriSETA	Coordination	Customer and Personal Service	Multilimb Coordination
BANKSETA	Speaking	Customer and Personal Service	Oral Comprehension
CATHSSETA	Operations Analysis	–	Explosive Strength
CETA	Programming	–	–
CHIETA	Speaking	Administration and Management	Written Expression
ETDP SETA	Learning Strategies	Education and Training	Oral Expression
EWSETA	Speaking	Administration and Management	Written Expression
Fasset	Speaking	Customer and Personal Service	Oral Expression
FoodBev SETA	Management of Personnel Resources	Personnel and Human Resources	–
FP&MSETA	Active Listening	Administration and Management	Written Comprehension
HWSETA	Management of Financial Resources	Economics and Accounting	Written Expression
Inseta	Speaking	Customer and Personal Service	Oral Comprehension
LGSETA	Monitoring	Customer and Personal Service	Oral Comprehension
merSETA	Speaking	Customer and Personal Service	Written Comprehension
MICT SETA	Speaking	Administration and Management	Oral Comprehension
MQA	Programming	Economics and Accounting	–
PSETA	Active Listening	Customer and Personal Service	Oral Comprehension
SASSETA	Active Listening	Public Safety and Security	Problem Sensitivity
SSETA	Active Listening	Customer and Personal Service	Problem Sensitivity
TETA	Reading Comprehension	Customer and Personal Service	Written Comprehension
W&RSETA	Management of Financial Resources	Clerical	Written Expression

Source: OECD Skills for Jobs database using the LMDS (2008–2019).

Note: Information is missing when all skills, knowledge areas or abilities are in surplus in that sector.

PART 5

Mismatch results

5.1 Mismatch by personal characteristics

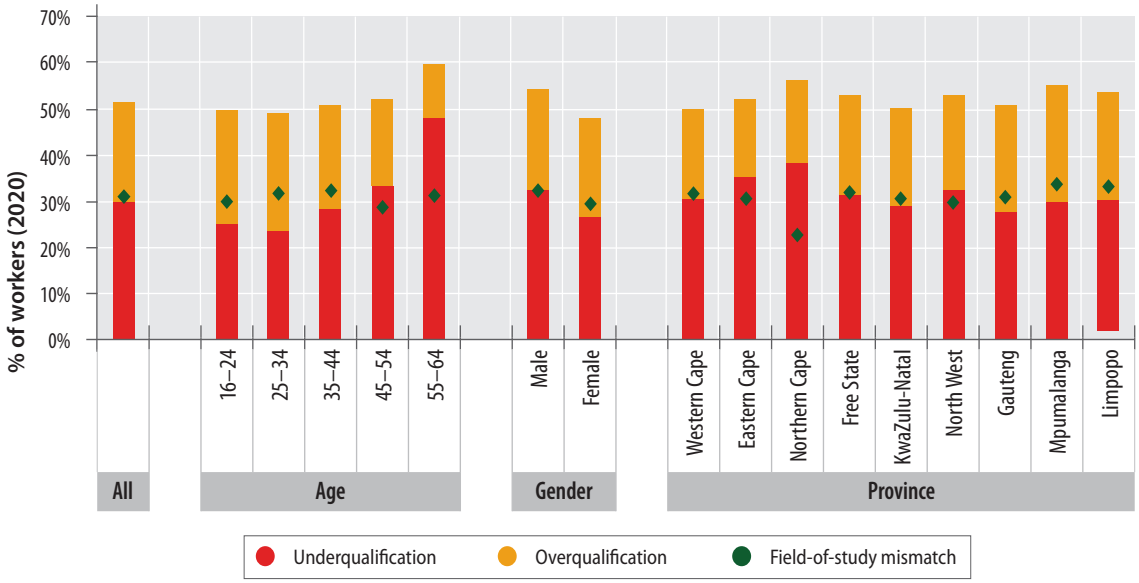
Qualification and field-of-study mismatch are common among South African workers (see Figure 5.1). In 2020, 51.5% of workers were mismatched in terms of qualification level: 30% of workers were employed in a job that would usually require a higher qualification level than the one they held (i.e., they were underqualified), while 21.5% of workers held a job that would usually require a lower qualification level than the one they held (i.e., they were overqualified). Moreover, 31% of workers are employed in a job that does not match the field of study of their highest qualification. The latter refers only to those who have a vocational or tertiary education qualification; as for the other education groups, there is no specific field of study (i.e., they are generic programmes for which the match with a certain occupation cannot be assessed).

In terms of the overlap between field-of-study mismatch and qualification mismatch, only 40% of workers with a vocational or tertiary education qualification are not mismatched by level or by field of study (Figure 5.2), whereas 20% are mismatched in terms of both level and field.

Estimates suggest that substantial gains in productivity can be achieved by reducing skills mismatches (McGowan and Andrews: 2015). At the firm level, underqualification is found to have a negative effect on productivity in Belgian firms, while overqualification has positive productivity effects (Kampelmann and Rycx: 2012). This finding was recently confirmed for the group of OECD countries; however, while over-skilling is associated with higher productivity at the firm level, it contributes to lower labour productivity on aggregate, because it tends to constrain the growth of other relatively more productive firms that could more efficiently utilise these workers (McGowan and Andrews: 2015). For workers, mismatches can have a negative impact on wages and on job satisfaction (Montt: 2015).

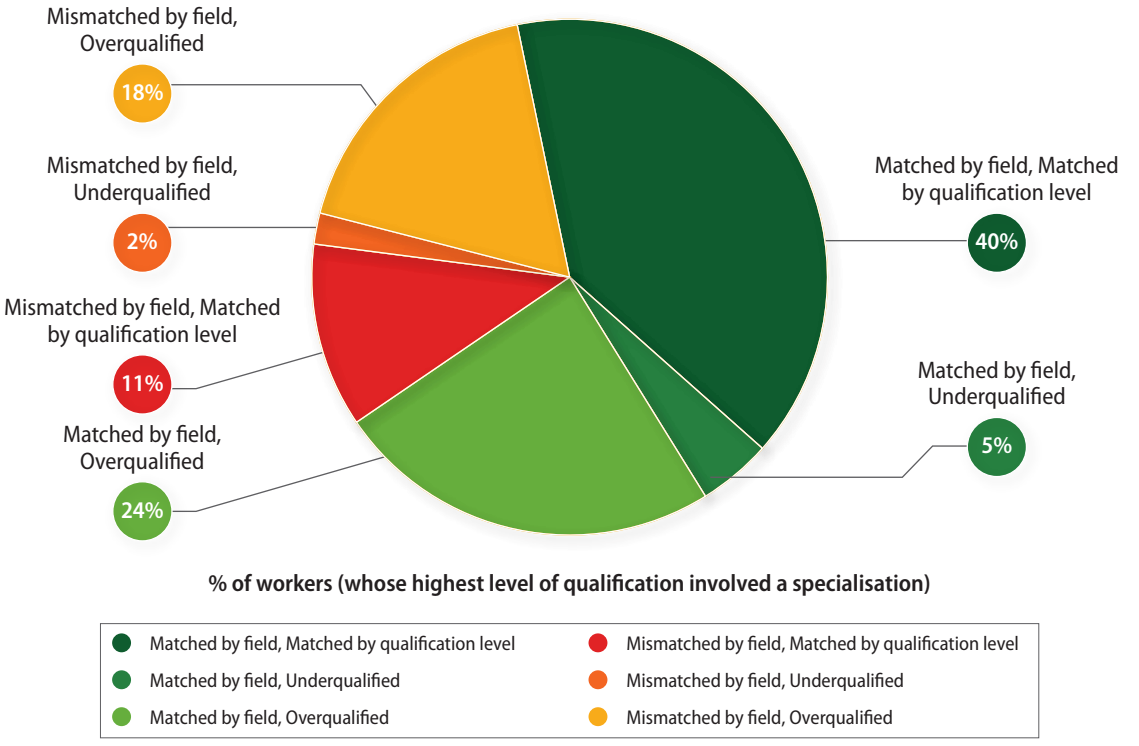
Older workers in South Africa are much more likely than their younger colleagues to be underqualified for their job: 48% of workers aged 55–64 are underqualified (see Figure 5.1). On the one hand, this indicates that education requirements in many occupations have gone up over time, while on the other hand it shows that older workers have often developed skills outside of the education system that are valued in the labour market. The incidence of mismatch also differs by gender, although the differences are relatively small (see Figure 5.1). Female workers are less likely to be underqualified or mismatched by field of study than male workers but they have the same incidence of overqualification. While small, these gender differences remain statistically significant even when controlling for occupation, job formality and age. Lastly, there is also variation in the incidence of mismatch between the different provinces in South Africa (see Figure 5.1). The share of workers who are underqualified is 10 percentage points higher in the Northern Cape than in Gauteng, while the share of overqualified workers is 8 percentage points higher in Mpumalanga than in the Eastern Cape. Field-of-study mismatch is highest in Mpumalanga (34%) and lowest in the Northern Cape (23%).

FIGURE 5.1: Qualification and field-of-study mismatch, by age, gender and province



Source: OECD Skills for Jobs database using the South African QLFS (2020).

FIGURE 5.2: Overlap between field-of-study and qualification mismatch



Source: OECD Skills for Jobs database using the South African QLFS (2020).

Note: Only includes individuals whose field of study is non-missing and not generic.

5.2. Mismatch by education level and field

When looking at mismatch by education level, some interesting findings emerge (see Figure 5.3). By definition, those who have the lowest level of educational qualification (i.e., primary or no schooling) cannot be overqualified, nor can those with the highest educational qualification (i.e., tertiary) be underqualified. Almost all workers with at most a primary education are underqualified, indicating that it is increasingly uncommon for workers to enter the labour market without having gone through at least some secondary education. Among workers with an upper-secondary qualification, 37% are in jobs for which they are overqualified. This is slightly higher than among those with a tertiary education qualification (34%). The results also show that those who have a post-secondary non-tertiary degree have a high incidence of qualification mismatch. While this is mostly a methodological artefact – this group represents a relatively small share of workers and this education level is thus never the most commonly observed education level among workers in a certain occupation – it is interesting to see that these workers are much likelier to end up in an occupation that mostly employs workers with a lower qualification level than in an occupation generally requiring a tertiary education degree. For field-of-study mismatch the differences are relatively small, with 33% of workers with an upper-secondary Vocational Education and Training (VET) qualification being employed in a different field than the one they specialised in, compared with 34% and 30% of workers with a post-secondary non-tertiary and tertiary education degree, respectively.

FIGURE 5.3: Qualification and field-of-study mismatch, by education level and field

Source: OECD Skills for Jobs database using the South African QLFS (2020).

Note: The 'generic' field covers those who have a general upper-secondary qualification (i.e., non-VET). 'Lower-secondary' includes everyone who completed at least Grade 9 but less than Grade 12 and those with an N1 qualification. 'Upper-secondary' includes those who completed at most Grade 12 and/or N2–4. 'Post-secondary non-tertiary' includes workers whose highest qualification is N5–6, Certificate and Diploma with less than grade 12.

Differences between workers with a different education specialisation are also important. Those who obtained a qualification in the field of education are least likely to be mismatched by education level and also have a very low incidence of field-of-study mismatch. Qualification mismatch is most common among those who studied services, but is also relatively high among those with a qualification in engineering, manufacturing and construction, and those with a qualification in social sciences, journalism and information, business, administration and law. Those who have a qualification in natural sciences, mathematics and statistics are the most likely to work outside of their field of study.

5.3 Mismatch by occupation and industry

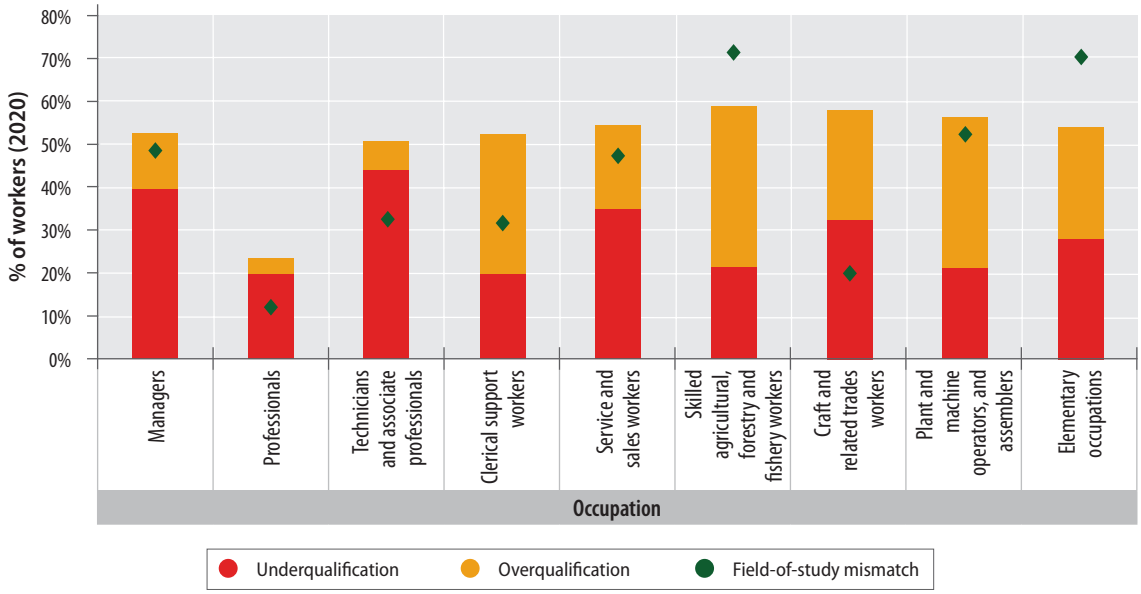
Some occupations have a higher incidence of mismatch than others. Underqualification is most common among technicians and associate professionals (44%), and managers (39%), while it is least common among professionals (20%) and clerical support workers (20%). Overqualification is most often observed among skilled agricultural, forestry and fishery workers (37%), and plant and machine operators and assemblers (35%), and least often among professionals (4%). Field-of-study mismatch is as high as 70% among skilled agricultural, forestry and fishery workers and those working in elementary occupations,[16] while it is only 12% among professionals. The low levels of mismatch among professionals reflect that many of the jobs within that category require a specific qualification (e.g., teachers, nurses, lawyers).

At the industry level, qualification mismatch ranges from 27% in the education, training and development practices industry to 59.5% in the mining industry. Underqualification is most common among workers in the agricultural industry (41%), while it is least common in the safety and security industry (16%). The share of overqualified workers is highest in the transport industry (33%) and lowest in the finance and accounting services industry (7%). Industries also differ strongly in their incidence of field-of-study mismatch: while less than 20% of workers (who specialised in a certain field while studying) are employed in a job that does not match their field of study in the finance and accounting services industry (16%), and the education, training and development practices industry (18%), this is the case for more than half of the workers in the fibre processing and manufacturing industry (51%), the services industry (51%), the culture, arts, tourism, hospitality and sport industry (55%), and the agricultural industry (63%).

The incidence of qualification mismatch is substantially higher in informal jobs than in formal ones: 36% of workers in informal employment are underqualified compared with 27% of those in formal employment, while the share of overqualified workers is similar. Moreover, among those in informal employment, 55% are mismatched by field of study, compared with only 28% among those in formal employment. While these differences between formal and informal employment are to some extent related to the fact that informal employment is concentrated in low-skilled jobs, the difference in the probability of being mismatched by field of study remains significant even when controlling for occupation, gender and age.

16 It must be noted that most workers in elementary occupations have low levels of education with no particular field of specialisation; hence they are neither matched nor mismatched.

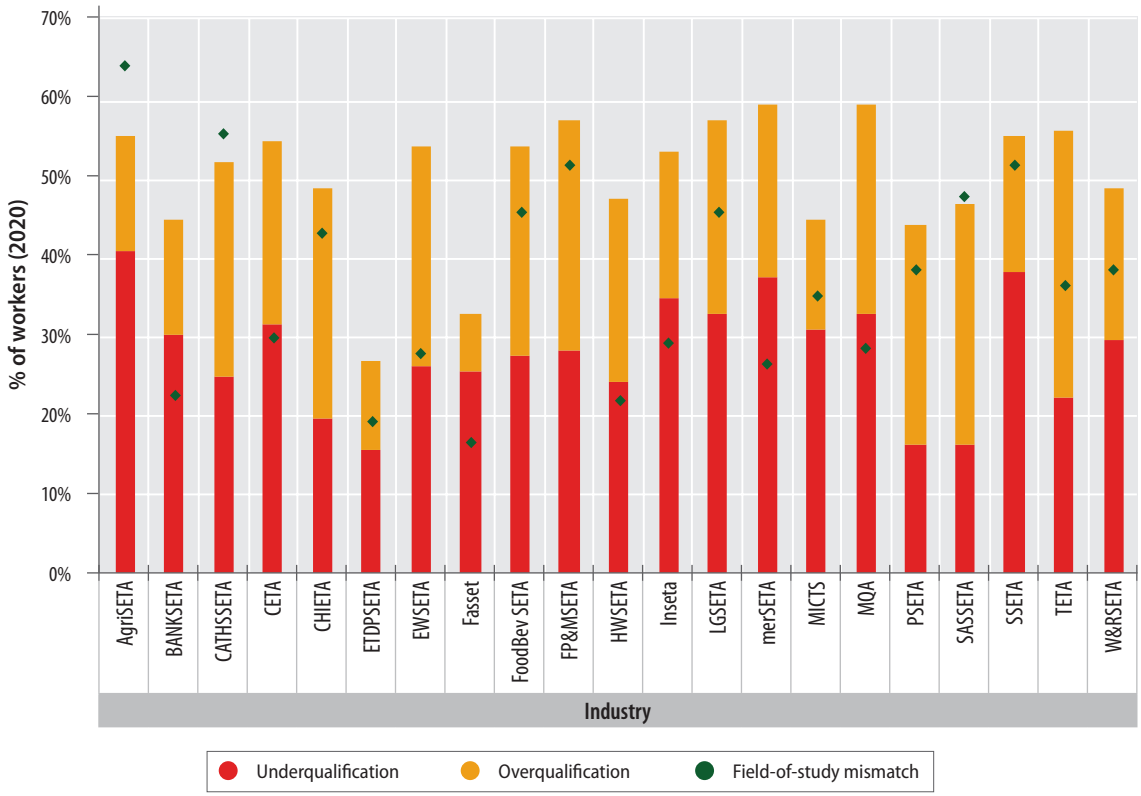
FIGURE 5.4: Qualification and field-of-study mismatch, by occupation



Source: OECD Skills for Jobs database using the South African QLFS (2020).

Note: ISCO-08 occupation groups.

FIGURE 5.5: Qualification and field-of-study mismatch, by industry



Source: OECD Skills for Jobs database using the South African QLFS (2020).

Note: See Section 3 for the industries represented by the SETAs.

PART 6

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Notes

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