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Conceptual Framework: Skills Supply and Demand in South Africa

Labour Market Intelligence research programme

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Acronyms and abbreviations

ACRONYM/ABBREVIATION	TERM/DEFINITION
4IR	Fourth Industrial Revolution
DHET	Department of Higher Education and Training
GDP	Gross domestic product
GER	Gross enrolment ratio
LFPR	Labour force participation rate
LMI	Labour Market Intelligence
NDP	National Development Plan
NPPSET	National Plan for Post-school Education and Training
NSC	National Senior Certificate
NSDP	National Skills Development Plan
OECD	Organisation for Economic Co-operation and Development
PSET	Post-school education and training
SETA	Sector Education and Training Authority
Stats SA	Statistics South Africa
TVET	Technical and vocational education and training
WPPSET	White Paper for Post-school Education and Training
WSP	Workplace Skills Plan

Glossary of terms and concepts

Labour market concepts

Working-age population: The working-age population is defined as all individuals aged 15–64 years.

Employed: An individual of working age is considered by Statistics South Africa (Stats SA) to be employed if, for at least one hour during the 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, was temporarily absent from a job or business (Stats SA, 2008: 8-9). The term 'employed' therefore includes employees, the self-employed, employers and unpaid family workers. This term is also interchangeable with the term 'workforce'.

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 (Stats SA, 2008: 8). The broad (expanded) definition of unemployment uses the same criteria, except that it does not require the unemployed to have been actively seeking work or trying 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. According to the narrow definition of unemployment, the labour force consists of the employed and the narrowly defined unemployed; the expanded definition includes 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: 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 the 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. Conventionally, the non-searching unemployed are referred to as discouraged work-seekers. However, Stats SA now defines discouraged work-seekers as a subset 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 referred to as the labour force participation rate (LFPR). Given the two definitions of unemployment, it is possible to calculate the corresponding narrow and expanded LFPRs.

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). However, the term may 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 which may not be adequately represented in the workforce's current skills profile, are also labelled in the South African discourse as 'critical skills', 'top-up skills' or 'skills gaps'. Skills may be thought of in terms of an educational attainment, such as passing Grade 12 or a obtaining a degree, or in terms of a qualification, such as a National Senior Certificate (NSC), an MSc degree or a diploma in nursing. Finally, skills can be categorised in terms of occupation; for example, electrician, nurse or civil engineer. In this document, the term 'skills' is primarily used to refer to qualifications or educational attainments. Where appropriate, however, it is also 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 the one end of the continuum, skills planning is about *identifying* skills requirements through research, analysis and social dialogue. At the other end, it is about *using* labour market intelligence (LMI) and data about skills needs for practical planning and action, including allocating 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 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 employers produce. Skills demand therefore reflects the skills that public and private sector employers need 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 the decisions of individuals to either participate (or not) in the labour force, to learn new skills and to migrate. In this context, it is important to understand the pipeline of skills acquisition, which includes the various components of educational and vocational training systems, 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 stock of skills within the current labour force and within the future labour force (which includes those individuals currently acquiring skills but who are not currently in the labour force). It can also include a consideration of how changes in labour force participation and migration affect skills supply.

Skills imbalance: A skills imbalance arises 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 shortage: A skills shortage arises when employers require human resources that are not supplied in sufficient quantities by individuals in the labour market. A skills shortage can indicate an inadequate number of workers in a particular occupation and is associated with hard-to-fill vacancies – where jobs cannot be filled due to a lack of appropriately skilled individuals.

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

Skills mismatch: A skills mismatch occurs where the skills supplied by an individual do not match demand exactly but are sufficiently close for employers to hire the worker. Skills mismatches refer either to the inadequacy of a worker's skills relative to the requirements of their job (e.g., having a lower level of qualification than that which is required, or being trained in a field of study other than the one generally required for the job); or to the situation where a worker's skills exceed the skills required for the job (e.g., having a higher level of qualification than is strictly necessary). A skills mismatch is categorised as either a skills gap, a qualification mismatch or a field-of-study mismatch.

Skills gap: A skills gap refers to a situation where a worker lacks one or more of the particular skills required to effectively perform their job.

Qualification mismatch: A qualification mismatch may result when a worker's level of education is not in line with the educational qualification/s required by their 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 they qualified.

PART 1

Introduction

Since the Department of Higher Education and Training (DHET) adopted the function of skills planning since its establishment in 2010, it has been compelled to look more closely at the relationship between education and training on one hand and the labour market on the other. The DHET undertakes this work through the Labour Market Intelligence (LMI) research programme, which is a major multi-year research project intended to support the DHET in its move towards a more responsive post-school education and training (PSET) system, due to a demand-driven approach to education and training.

A key component of the LMI research programme is the development of conceptual frameworks to guide each research project. Conceptual frameworks serve as lenses through which the activities of the LMI research programme are viewed, and ensures conceptual consistency across the research programme so that its objectives can be achieved. Importantly, the framework facilitates a common understanding not only between researchers, but stakeholders in government, the private sector and civil society, too. Conceptual frameworks for individual projects also set the parameters of each project, and is part of the research process where ideas for the research topic are explored and enunciated.

With this in mind, this framework outlines how skills supply and demand is understood. This is done for the purpose of conducting relevant research and building a body of labour market intelligence to guide skills planning that is responsive to the skills needs of the country within the context of the LMI research programme. This framework should be used to guide the development of key individual projects under the LMI research programme within a shared understanding of the approach the LMI research programme takes to understanding skills supply, skills demand, and the imbalances between the demand for and supply of skills.

Through the framework, which allows skills shortages, surpluses and mismatches to be identified and analysed, government policy can be formulated. Ultimately, rigorous labour market information combined with evidence-based policies will result in reduced mismatches between education and training on the one hand and the labour market on the other, as well as in improved levels of employability and the identification of self-employment opportunities for sustainable livelihoods.

1.1 Background: policy frameworks

Since 1994, government has implemented various policy initiatives relating to or impacting skills development. Of particular relevance is the White Paper for Post-School Education and Training (WPPSET), the National Plan for Post-School Education and Training (NPPSET) and the National Skills and Development Plan (NSDP). Within these developmental plans, the challenges around skills are frequently identified as of central importance and are highlighted for policy attention.

The main objective of the WPPSET, which was published in 2013, was to improve the capacity of the PSET system to better align with the requirements of the public and private sectors, and broader developmental goals. Specifically, the WPPSET notes that 'if the provision of education and training is to be better coordinated with the needs of society and the economy, central information about skills needs is required' (2013: 58). To achieve this goal, the WPPSET calls for the establishment of a Skills Planning Unit within the DHET that 'will work with key public institutions, such as universities and other research institutions, to develop an institutional mechanism for skills planning' (DHET, 2013: 58).

The NPPSET, which is the implementation framework for the WPPSET, further emphasises the importance of labour market intelligence. The NPPSET notes that the DHET understands the need to generate capacity for the analysis of labour market information to support the government's economic and social development priorities (DHET, 2017). Specifically, the NPPSET states that the Skills Planning Unit mentioned in the WPPSET is 'now being conceptualised as a PSET Planning Unit, which will have improved capacity to make use of labour market data from a wide range of sources, building on the data available through Sector Education and Training Authorities (SETAs), and a number of mechanisms developed through the Labour Market Intelligence Programme (LMIP)' (DHET, 2017: 26).

The NSDP (DHET, 2019), whose purpose it is to increase access to education and training opportunities to enable all South Africans to participate meaningfully in the economy, also maintains that labour market information is crucial to understanding the labour market. Vital to understanding skills demand is an 'analysis of sectoral growth and development plans and labour market information' (DHET, 2019: 27). This analysis will 'result in an evidence-based understanding of skills and occupations requirements to support economic and social development priorities' (DHET, 2019: 27).

1.2 The importance of labour market intelligence

The importance of labour market intelligence is particularly evident in South Africa, which faces the twin challenges of low economic growth and a perennially high unemployment rate (Rodrik, 2008). One of the major constraints impeding higher economic growth is skills shortages (Bhorat et al., 2020). Firms that are unable to fulfil positions for an extended period represent lost productivity and competitiveness, and ultimately prevent international firms from investing in the country (Rihova, 2016). The effect of skills shortages is compounded by South Africa's growth trajectory, with an increasing demand for high-skilled workers as a result of its transformation to a more services-based economy (Bhorat et al., 2020). In this context, labour market intelligence can help to overcome this constraint by designing initiatives that create better matching between demand and supply in the labour market. This will result in better utilisation of South Africa's stock of human capital, and enhance productivity and economic growth.

On the supply side, labour market intelligence also has a role to play in South Africa by supporting the vast number of unemployed to obtain skills that the labour market demands. In conjunction with having one of the highest unemployment rates in the world (Nonyana & Njuho, 2018), South Africa has a long-term unemployment challenge, with 70.7% of the unemployed having been unemployed for 12 months or longer, the second highest among countries surveyed by the OECD (OECD, 2023). Long-term unemployment can have negative psychological effects on individuals, such as decreased self-esteem, a loss of self-confidence and a disconnection from society (De Witte, Rothmann & Jackson, 2012). On a macro level, social cohesion can break down if a substantial proportion of the population is unemployed (Rihova, 2016). In these circumstances, labour market intelligence can support the unemployed by generating data that can be used to develop policies that allow them to obtain the skills demanded by the labour market.

Labour market intelligence can also play a pivotal role in supporting a country's economic recovery from an economic shock, such as a global financial crisis or a pandemic. After the global financial crisis in 2008/2009, the USA prioritised identifying future skills requirements as one of the pathways towards economic recovery (Cappelli, 2015). In South Africa, a recent study showed that 3 million jobs were lost

between February and April 2020 as a result of the Covid-19 pandemic (Spaull, 2020). A key part of any economic recovery involves understanding the dramatic changes to the labour market and providing direction on how individuals who lost their jobs can obtain new ones in the changed economic landscape. For example, some businesses in certain sectors might never return, while there has been an increase in the demand for certain other types of businesses. This re-allocation of business activity will change the demand for skills, the implications of which can only be elucidated through a thorough analysis of labour market intelligence data.

Ultimately, in a low-growth and high-unemployment economic environment such as South Africa, it is key for the demand and supply of skills to align as closely with each other as possible to support growth and employment. To do this, a comprehensive labour market intelligence system is required, one that can anticipate future skills demand and lead to the formulation of skills development policy that is responsive to ever-changing skills needs. This labour market intelligence system must allow for the creation of a set of indicators for the components of skills demand and skills supply (DHET & EU, 2017). These indicators should allow us to understand certain key features of skills demand and supply, including (DHET & EU, 2017):

- current and emerging labour market issues, monitoring change and assessing progress;
- providing information relevant to government, such as identifying high-demand occupations or critical skills shortages, and determining which occupations are prioritised in the immigration system; and
- developing policy tools to address immediate labour market issues highlighted by the labour market intelligence.

Powell et al. (2016) highlight three approaches that have been used to produce labour market intelligence around the world.

1. **Developmental state model:** This model entails the state actively intervening in the labour market by taking responsibility for the human capital development process, while considering the country's socio-economic realities. Countries that have adopted this approach include Singapore and South Korea. A key feature of this model is its future orientation: the state decides which sectors to prioritise and, based on this, decides which skills need to be developed. As such, this model assumes that policies for growth and education and training are aligned with each other.
2. **Social partnership model:** In this model, social partners work together to manage supply and demand. Countries that have adopted this approach include Sweden and Finland. According to Green (2013), this can either take the form of employers and trade unions working together or it can include the government, which uses its power to co-ordinate skills demand and supply to achieve wider socio-economic objectives. The key feature of this model is consensus: parties are required to come to an agreement regarding both the policies and their implementation.
3. **Sector-based model:** In this model, skills are developed in response to labour demands in the priority sectors. Countries that have adopted this approach include the USA, the UK and Canada. In contrast to the developmental state model, this model is concerned with current skills requirements and there is minimal state intervention. Key features of this model include the establishment of sectoral bodies, including all relevant stakeholders (e.g., government, business and trade unions), and policies that influence the type and quality of skills produced.

Out of the three approaches described above, South Africa most closely resembles the developmental state model. This is evident in the National Development Plan (NDP) which, *inter alia*, specifies future priority sectors and the skills required for those sectors to grow.

The choice of variables included in the conceptual framework presented in Figure 1 is guided by the goals of the LMI research programme:

- **Align skills planning with economic planning:** In directing the country's economic growth path, the South African government's economic planning and policies are key factors impacting skills supply and demand. These interventions are therefore important factors within the broader national context that shape overall demand for skills, leading to particular patterns of skills imbalances and, ultimately, skills planning and policy responses.
- **Identify skills needs across the economy:** Skills needs are identified through skills imbalances that arise where there is an imperfect match between skills demand and skills supply. These imbalances include occupational shortages and surpluses, skills gaps, migration gaps and mismatches across the economy.
- **Ensure that skills are not a constraint on economic growth:** Skills policy and planning must be based on a thorough understanding of the state of the labour market within the broader economic context. Based on the regular flow of labour market intelligence, policymakers can design appropriate policies to ameliorate the skills constraint on economic growth and, critically, assess the impact of these policies and adapt them over time.
- **Promote the use of labour market intelligence for skills provisioning:** The labour market intelligence generated over time is to be made publicly available through a range of outputs. This includes both analytical work and statistical measures of, for example, skills shortages, surpluses and mismatches. While the primary targets for such outputs are actors within the skills policy space, the regular provision of these outputs to the public – as well as ongoing engagement by stakeholders with these outputs – will encourage their use.

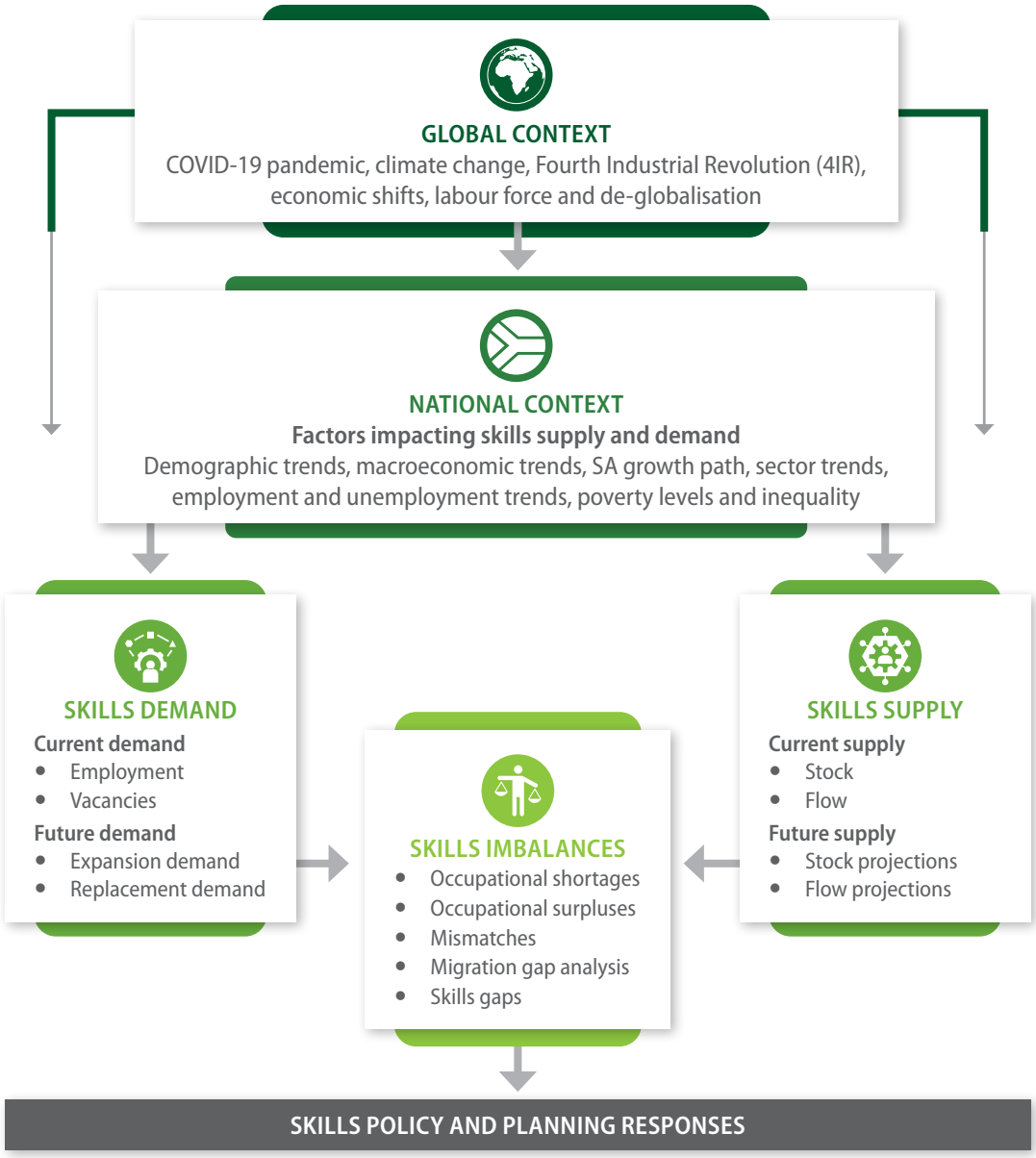
PART 2

Conceptual Framework

Figure 1 presents a framework for understanding skills supply, skills demand and the skills imbalances that arise between them. It is the basis upon which the report on *Skills Supply and Demand in South Africa* (produced as part of the LMI research programme) is prepared. Furthermore, it provides the context within which other LMI research programme projects on skills demand, skills supply, skills imbalances, and appropriate responses to remedy the imbalances between the demand for and supply of skills, should be understood. Specific indicators related to key concepts within the framework can be found in the *Key Indicators for Skills Planning in South Africa* report.

In terms of this framework, skills supply and demand in South Africa needs to be understood within the broader national and global context. The numerous contextual factors impacting skills supply and demand vary in importance over time, and their impact may operate directly or indirectly. The interaction of supply and demand often gives rise to skills imbalances, which can signal the need for policy intervention.

FIGURE 1: Framework for the analysis of skills supply, skills demand and skills imbalances



2.1 The global context

A range of factors can either directly or indirectly influence the supply of and demand for skills. In the global context, these range from current events, such as the impact of the Covid-19 pandemic, to long-term trends such as climate change, the Fourth Industrial Revolution and de-globalisation. The ability of a government to influence such factors is limited. However, these global factors impact the national context, where the government is more able to exercise its policy levers to achieve desired outcomes. These are discussed in more detail below.

2.2 The national context

There are numerous national contextual factors that influence skills supply and demand. In relation to skills supply, the framework identifies the following specific factors:

1. **Demographic trends:** Demographic trends can either increase or decrease the supply of labour. If a country's population is aging, labour supply might be decreasing among the working-age population, as more people retire than enter the labour force (Leitner & Stehrer, 2019). On the other hand, if the median age of the population is low, the labour force will expand as more people enter the labour force than leave it (Leitner & Stehrer, 2019).
2. **Education and training:** Education and training influences the supply of labour through the attainment of qualifications and skills. Qualifications should provide signals to potential employers that one has certain abilities to fulfil the responsibilities of a job.
3. **Labour force participation:** Labour force participation records the proportion of the working-age population who are either in employment or looking for employment. All other things equal, a higher LFPR is associated with a larger supply of labour, while a lower LFPR reflects a smaller supply of labour.

In relation to skills demand, the framework identifies the following factors that are key to understanding skills demand in South Africa:

1. **Economic growth path:** The economic growth path of a country can determine what types of skills are demanded. As government policies steer the South African economy towards particular growth sectors, the pattern of skills demanded by the economy can change in important ways, as the types of skills required by these sectors become increasingly important.
2. **Sectoral trends:** The demand for skills may evolve over time as some economic sectors rise and others decline. These shifts can occur for any number of reasons. Over the past decades, for example, South Africa's gold mining sector has declined in relative terms, while the finance sector has grown rapidly, thereby changing the overall pattern of skills demanded by the economy. At the same time, trends within sectors can result in changes to the kinds of skills required. Thus, for example, technological change within the manufacturing sector can change the types of skills demanded by the sector.
3. **Macroeconomic trends:** One key macroeconomic indicator is current and future gross domestic product (GDP) growth. If a country's economy is healthy and the future looks promising, companies will invest, creating additional jobs and, by extension, increasing the demand for skills.

2.3 Skills demand

The demand for skills originates in the needs of employers to deliver the goods and services they offer. From a policy perspective, understanding the economy's skills requirements is critical, as it determines the ability of policy to improve the alignment between skills demand and supply. Skills requirements can be understood in terms of either current skills demand or future skills demand, and can therefore give rise to policy interventions with different time horizons.

Current employment is the starting point for analysing current skills demand. However, where certain skills are in short supply, current employment might not reflect the demand for skills; instead, it might simply reflect that portion of demand that is satisfied by the supply of skills. Consequently, an accurate picture of current skills demand based on current employment patterns must incorporate additional information that accounts for vacancies. Essentially, skills demand consists of two components: fulfilled demand (as indicated by current employment) and unfulfilled demand (as indicated by vacancies).

Future demand for skills can be quantified by understanding the evolution of skills demand over time. For example, the nature of future economic growth determines which sectors will likely see job gains or job losses over time. 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 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 needed for these occupations through an occupation-qualifications mapping process. This process then provides the skills (qualifications) requirements of the economy, or the predicted skills demand.

Two key concepts related to predicted future skills demand are replacement demand and expansion demand. Replacement demand is defined as 'the jobs resulting from the departures of workers that need to be filled by new workers' (Willems & De Grip, 1993: 173). There are several reasons why workers leave a job, including retirement, death, debilitating sickness or injury, emigration, an offer of a better job elsewhere and, in the case of women especially, family formation (Cedefop, 2010). Expansion demand refers to 'net new job openings arising from change in industry demand for labour by occupation' (Gasskov, 2018: 18). Industry demand can be influenced by rising or falling sectoral output, technological change and productivity improvements, which might require fewer workers or different types of workers to be hired (Gasskov, 2018).

Expansion demand is the demand corollary of the skills supply pipeline. It is the flow that takes one from the current demand for skills to the future demand for skills, just like the skills supply pipeline links the current supply of skills to the future supply. However, unlike the skills supply pipeline, expansion demand cannot easily be observed: data on the number of students enrolled is easily available but firms' expansion plans are not. Expansion demand is a concept that emanates from the labour supply and demand model – it is part of the mechanism that moves the model from the present to the future.

2.4 Skills supply

The stock of skills in the economy – i.e., the mix of skills, qualifications or occupations held by the labour force – is what is meant by skills supply. Analysing skills supply in terms of occupations, however, is not always possible. For example, where a large proportion of the unemployed have never worked before, such as in South Africa, there is a significant gap in our ability to assess the mix of available skills, since such individuals are unable to indicate their occupation or previous occupation.

Since a country's stock of skills changes over time, it is important to also understand the *flow* of skills, both into and out of the labour market. Factors that influence the supply of skills include, for example, demographic and migration trends, changing labour market conditions that encourage or discourage participation and, critically, the skills pipeline. Thus, projections of the future supply of skills must be informed by analysis of, among other factors, the education and skills pipelines, the changing age structure of the population, trends in labour force participation and international migration flows.

In addition to the above factors impacting the supply of skills, there are several indicators that measure the stock of and flow of skills, as described in the framework. Measures related to the stock of skills include, for example, the highest level of education among the employed and the unemployed. Flow-related indicators include the National Senior Certificate (NSC) pass rate, gross enrolment ratio (GER) in higher education, and technical and vocational education and training (TVET) participation and certification rates, for example.

2.5 Skills imbalances: the intersection of skills demand and supply

Within the labour market, skills supply is matched against the demand for skills in the economy. In scenarios where skills supply and skills demand are aligned with each other, no specific adjustment or intervention is required in the education and training system. However, misalignment of skills supply and demand leads to skills imbalances that need to be addressed through appropriate policy and implementation actions.

Five key concepts relating to skills imbalances are highlighted here:

i. ***Skills shortages***. These 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.
ii. ***Skills surpluses***. These 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.

iii. ***Skills mismatches***. These 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.

iv. ***Skills gaps***. A skills gap refers to a situation in which a worker lacks a particular skill required for a job, even though they may have the appropriate qualifications and even experience. Skills gaps usually arise due to the introduction of new technologies, new work processes, and changes in approaches and techniques at the workplace.

v. ***Migration gap***. This refers to the difference in skill levels between emigrants and immigrants. It is important to note that data to perform this analysis in South Africa is not currently available and is an issue that should be addressed by all relevant stakeholders with the aim of obtaining high-quality, timeous data.

The types of imbalances identified through the considerations of supply relative to demand inform the actions that need to be taken within education and training systems so that the market's demand for skills can ultimately be met by a supply of sufficiently skilled workers. Appropriate feedback and decisive action taken in line with that feedback is necessary to ensure that the current stock of skills evolves over time to better align with the pattern of skills demanded by the economy, thereby reducing the likelihood of skills imbalances in the future.

PART 3

Limitations

Although every effort has been made to create a conceptual framework that accurately represents skills supply and demand in South Africa, there are a few limitations in the framework, which are highlighted here.

Firstly, although there are many global factors that can affect skills supply and demand, these factors cannot be measured easily. For example, although the 4IR will create more demand for certain types of skills, it is difficult to find a suitable indicator that can inform policymakers about the magnitude of the change in demand for skills and the timelines associated with the change. In a similar fashion, climate change will result in a change in demand for certain types of skills, but because the effects of climate change will be long term and vary by country, a suitable indicator is challenging to find.

Secondly, the conceptual framework cannot account for all factors that might affect skills supply and demand in the future. Uncertainty is inherent in predictions about the future, as unforeseen events emerge over time. One such recent event is the Covid-19 pandemic, which caused significant disruption to labour markets and economies around the world, but which was not foreseen by any government.

A third limitation relates to a lack of data to measure some variables. For example, two key factors related to future skills demand are replacement and expansion demand. However, currently there is no standardised data to measure these two factors in the South African labour market. It is possible to proxy certain components of replacement demand. For example, Reddy et al. (2016) estimated the number of retirements that could occur in the South African workforce based on age data. Information from SETA interviews could also be used to estimate replacement demand, based on the amount of data provided. However, in both cases described, the data is imperfect and not comprehensive, providing limited understanding of replacement and expansion demand in South Africa. This makes it difficult to forecast future skills demand. A lack of data also complicates assessments of the migration gap, as high-quality data that measures educational qualifications of emigrants and immigrants does not currently exist in South Africa.

A fourth limitation relates to the significant information gap that exists in the form of data provided by firms themselves on their demand for skills. Consequently, current and historical employment estimates – such as those 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 possessed by those who are already employed, but also the skills that employed persons do *not* have that might be desired by their employers, as well as the demand for new skilled employees that is currently not being met. Comprehensive, good-quality data does not currently exist on these latter two groups (desirable skills and unmet skills), although there have been various efforts to collect firm-level data on the part of SETAs (through surveys) and the DHET itself. In the case of SETAs, however, not all employers are required to submit Workplace Skills Plans (WSPs) to their SETAs, while some employers who are required to submit data might choose not to do so. As a result, the data collected might not be representative of all employers in the sector.

PART 4

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