

SOUTH AFRICA **in the** **DIGITAL AGE**

Digital readiness assessment appendix

DETAILED MEASUREMENT OF SOUTH AFRICA'S READINESS
TO TAKE UP ECONOMIC OPPORTUNITIES IN THE DIGITAL AGE

Appendix to a report by Genesis Analytics in partnership with the
Gordon Institute of Business Science and the Pathways for Prosperity
Commission on Technology and Inclusive Development

Table of Contents

Table of Contents	1
Universal Digital Access	1
An overview of internet usage	1
Infrastructure	2
Electricity coverage	3
Undersea cables.....	4
Fixed line coverage and quality	5
Mobile network coverage and quality	7
Affordability.....	8
Data	8
Devices	10
Telecommunications regulation.....	12
Human Capital.....	14
Raw talent supply for emerging jobs.....	15
Basic and secondary schooling	16
Access to educational pathways	18
Providers of educational pathways.....	19
Higher Education Institutions	20
Technical and Vocational Education and Training.....	21
Accreditation of educational pathways qualifications.....	21
Business involvement in educational pathways	23
Retaining and Attracting Critical Skills.....	24
Government Support	27
Government as the foundation of the digital economy	28
Intellectual Property Regulation	28
Data and Cyber-Security Regulation	29
Taxation Policy and Digital Business	31
Government as a purchaser of business services	32
Government as an enabler.....	34
Financial and non-financial incentives.....	34
Local government engagement with business	37

Government as a regulator	38
Sector-specific regulation	38
Labour regulation in the digital age	40
Competition Policy in the Digital Age	42
Innovative Business.....	45
Innovation Financing	46
Start-up and Early Stage Finance	46
Established Firm Finance	48
R&D Investment	49
Non-financial Investment Support	50
Start-up ecosystem	50
Open Architecture.....	52
Innovation Culture.....	53
Entrepreneurship	53
Corporate Innovation.....	54
Access to and adoption of digital technologies	57
Constructing Ecosystems.....	59
Business-to-business co-ordination	59
Public private solutioning	60
Ecosystem stewardship	62
Access to global markets.....	64
Alternative Opportunities.....	67

Universal Digital Access

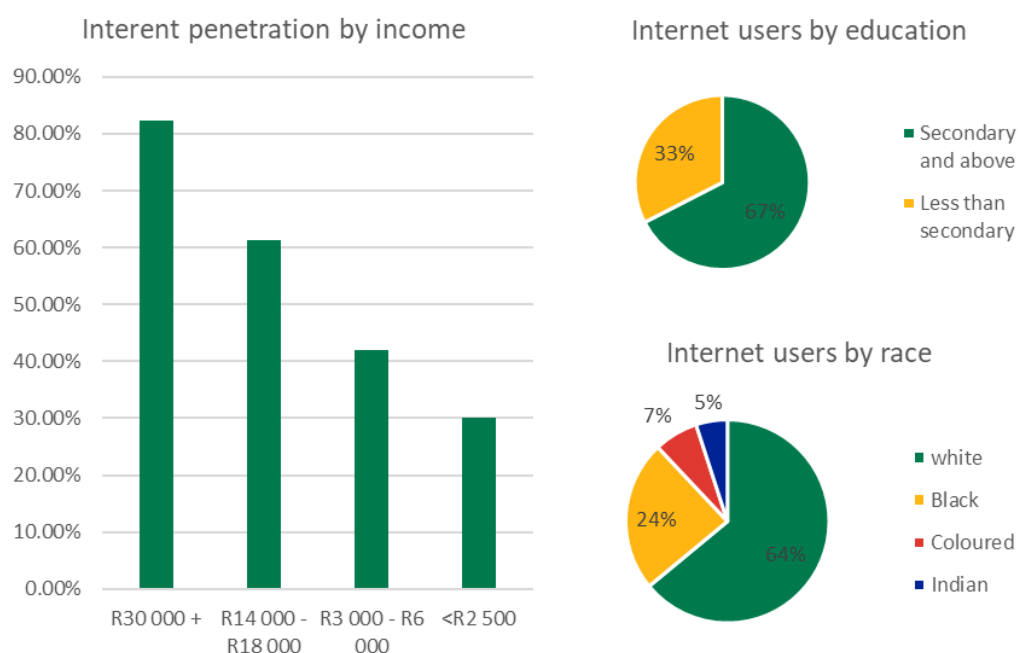


Digital infrastructure, networks and universal access to the internet are foundational requirements for a digitally enabled economy as they allow businesses and individuals to participate in emerging economic opportunities. This access is predicated on the availability of infrastructure, the quality of internet connections, well-functioning telco regulation and the affordability of data and devices. These are the conditions measured in this pillar with a snap-shot of internet usage preceding the condition measurement.

An overview of internet usage

Regardless of 54% internet penetration, internet usage falls short of the levels needed for citizens and businesses to fully leverage the opportunities created by the digital economy. Although access to digital networks and the internet has been improving, internet usage is unequally spread and lacklustre among uneducated and low-income individuals. The gap between the connected and unconnected leads to disparities in access to opportunity. This 'digital inequality' is widening and compounded by differences in the financial resources and skills needed to use the internet optimally.¹ Approximately 31% of South Africans are active

Figure 1: Internet Usage in South Africa



Source: World Wide Worx, Magooze & After Access

¹ RIA. (2017). The State of ICT in South Africa

internet users and 30% active mobile internet users. Figure 1 illustrates how access varies by race, income and education.

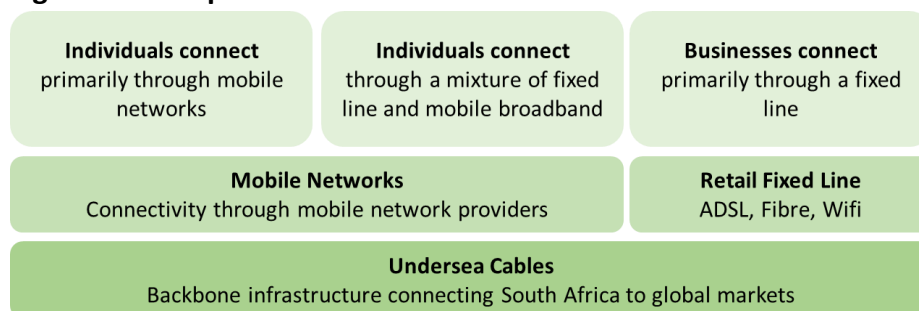
The distribution of internet usage by race is severely skewed due to differences in earnings between racial groups. On average the white population have high levels of access at 64%, with far inferior levels of access for the black, coloured and Indian populations at 24%, 7% and 5% respectively². These figures are worrying given the socio-economic context of South Africa - only 7.8% of the population are white while 80.9% are black³. On average, this white minority earns nearly 5 times as much as the black population. These results correlate with lower levels of internet penetration at lower levels of income, leading to the majority of those excluded from the internet being low-income earners.⁴

A geographic view shows that a digital divide exists between major metros and non-metro areas and between different cities and provinces. Internet penetration in the Western Cape is at 75%, followed by Gauteng at 55%⁵. Internet usage in urban areas exceeds rural usage by a relatively small gap of 8%⁶ which evidences the role access to mobile technologies have in servicing non-urban communities. This has allowed rural communities to access services that were previously inaccessible by overcoming the limitations of the fixed-line market which faces high installation costs in rural areas where communities are dispersed or have low density populations.

Infrastructure

South Africa is the continental leader in ICT infrastructure and is connected to the internet through multiple high-speed undersea cables, fixed network operators and mobile network services. Readiness for leveraging digitally enabled opportunities is dependent on the availability of this digital infrastructure by enabling business and individuals to quickly adapt to the rapid changes created by the agile nature of the digital economy. South Africa's physical digital infrastructure is evaluated in terms of electricity coverage, undersea cable infrastructure, fixed line coverage, and mobile network coverage.

Figure 2: A snapshot of the current infrastructure market structure



Source: The State of the ICT sector in South Africa, 2017

² Online Media (2014) - *Internet Usage in South Africa* – Magooze

³ StatsSA (2017). Mid-year population estimates.

⁴ RIA. (2017). *The State of ICT in South Africa*

⁵ World Wide Worx. (2017). *Internet Access in South Africa*

⁶ Siemens. (2017). *Digitalization maturity report*.

Electricity coverage



Competing in the digital age requires an efficient and sustainable supply of electricity that matches rising demand. South Africa is yet to achieve universal electricity access with 85% of South Africans and 67% of the rural population having access to electricity in 2016⁷. Policymakers are tasked with extending access to this 15% while combatting challenges in energy sustainability and stability of supply.

Eskom - South Africa's electricity public utility - is currently facing major supply constraints. Many individuals and businesses are intermittently left without electricity as Eskom seeks to stabilise the power grid. These shortages in electricity supply are due to inadequate coal reserves, poor maintenance and other structural issues at Eskom. South Africa ranks below BRIC nations and the global median in the quality of electricity supply and has a deteriorating measure of the quality of electricity infrastructure, again below the majority of BRIC comparators and global averages.⁸

Load-shedding has detrimental effects on the economy and especially the poor. Load shedding threatens jobs, forces businesses to pause operations, compromises people's standards of living and creates suffering for consumers through financial losses as power surges damage appliances⁹. Individuals and businesses with low levels of income can afford few alternatives for charging and powering electronic devices and may therefore be disconnected from digital opportunity. In an effort to achieve financial stability, electricity costs have accelerated in real terms since 2007 creating undue burdens for business and costs for consumers¹⁰. Financial support to the SOE has had a massive burden on the fiscus which will persist over the next 3 years at nearly R70 billion a year¹¹. While the presidency has noted its intention to decouple the entity into an independent generator, transmitter and distributor, it is uncertain whether this will achieve financial stability of the collective entity.

Ensuring universal internet access and that the supply of electricity is sustainable requires reduced reliance on coal and strengthening generation from alternative power sources. The Renewable IPP procurement programme recognises that South Africa can leverage the high level of renewable energy potential to sustainably increase power supply. This programme has led to more domestic investment by independent power producers over the past 4 years than the rest of Sub-Saharan Africa over the past two decades. Since the programme's inception in 2013, there have been 102 projects with a production capacity of 6378 megawatts. One of the outcomes of the programme has been the decline in average energy

⁷ World Bank (2019)

⁸ WEF (2018). Global Competitiveness Index

⁹ Online Media (2019) Various news articles.

¹⁰ Deloitte (2017). An Overview of Electricity Consumption and Pricing in South Africa

¹¹ Online Media (2019) – Eskom gets R69bn in financial support over 3 years – Fin24

prices.¹² The programme was however put on pause for almost 3 years because of political volatility. However, in April 2018 the programme resumed, with Eskom entering into an agreement for 27 large-scale renewable energy projects. Investors will be looking for policy certainty in the new integrated resources plan and signals that programmes such as the IPP will not be subject to the same levels of political volatility as before.¹³

Evaluating the quality, scale and dynamics of electricity coverage combines public perception, expert opinion and survey findings. Given the infrastructure's universal relevance and technical operation, data sources are robust and readily available for local measures and for international comparability

Supplementary data and empirics:

- The development of a nationally accepted estimate of the cost of load shedding for society. Dimensions should include geography and distinction between business and consumers.
- Evaluation of the accuracy of Eskom load-shedding schedules to understand business capacity for planning



Undersea cables

With an international internet bandwidth of 149.5Kb/s per user, South Africa is ranked 18 of 139 countries and well placed to compete in the global digital market. Undersea cables are required to support South Africa's increasing demand for broadband as they transport 98% of global data¹⁴. Six undersea cables connect South Africa to the rest of the world. Investment in new cable infrastructure has significantly reduced the price of international bandwidth while a forthcoming undersea cable connecting South Africa to Brazil is expected to decrease South Africa's latency by up to 140 milliseconds¹⁵.

High speed internet is a comparative advantage that improves the speed and quality of internet access for all. While this may not be directly relevant for everyday users it will benefit individuals accessing markets that require an individual or a business to do real time, high frequency operations such as trading.

Given that undersea cables have technical specifications and connectivity of countries is widely known the analysis is data driven and highly objective.

¹² Eberhard & Naude (2017). The South African Renewable energy IPP procurement programme

¹³ Online Media (2019) - IPP procurement programmes a powerful tool and investor confidence cannot be understated - Business Day

¹⁴ Online Media (2018) - New Cape Town/Brazil subsea cable to boost SA broadband - BIZCommunity

¹⁵ Online Media (2018) - Boosting SA broadband : New subsea cable will connect Cape Town to Brazil - BizNews

Fixed line coverage and quality



South Africa has the continent's most extensive ICT infrastructure driven by investments in fixed line coverage and the growth of fibre networks. South Africa ranks 139 of 190 countries in fixed line penetration¹⁶ - significantly higher than continental comparators. Fixed line and fibre networks are most prominent in high-income metropolitan areas with fibre-to-the-home (FTTH) servicing only 2% of internet connected households, and urban areas 15 times more likely to have fixed line coverage than rural areas^{17,18}. Disparities in access between rural and urban populations are therefore large however far smaller than other African markets¹⁹. Lack of rural infrastructure and its high costs therefore make fixed line connections inaccessible for low income and rural businesses who must rely on less stable mobile networks and data bundles as an alternative. This disadvantages SMMEs and businesses seeking to compete in the digital world if they operate outside of metropolitan areas or have levels of income - only 46% of SMEs have no access to fixed line internet²⁰.

Copper fixed line has seen a decline in usage due to the move from voice to data directed towards mobile broadband services and rising FTTH coverage. Telkom alone saw a 38% increase in mobile broadband use. In contrast to copper fixed lines, FTTH is seeing healthy growth with 35 operators entering the fibre-to-the-home (FTTH) market since 2014. In addition to the existing 8,000km Vumatel fibre and 10000 Dark Fibre Africa fibre, major investments were made by mobile operators. South Africa now has over 60,000 km of unduplicated fibre and over 80,000 km of duplicated fibre.

Despite the rolling out of FTTH, South Africa fares unfavourably in the quality, speed and reliability of fixed line connections. South Africa's fixed line broadband internet speed and quality of connectivity is more than 50% below the global average at 20.1 Mbps, placing South Africa at disadvantage relative to competitors such as China, Brazil and USA²¹. Approximately 41% of small businesses indicated that slow, unreliable connectivity is a barrier to participation in the digital economy however these speeds are rising²². Furthermore the National Treasury has allocated R1.9 billion to South Africa Connect to invest in high-speed internet connections.

¹⁶ ITU (2019). Fixed Broadband Access data

¹⁷ RIA. (2017). The State of ICT in South Africa

¹⁸ ITU (2019). Fixed Broadband Access data

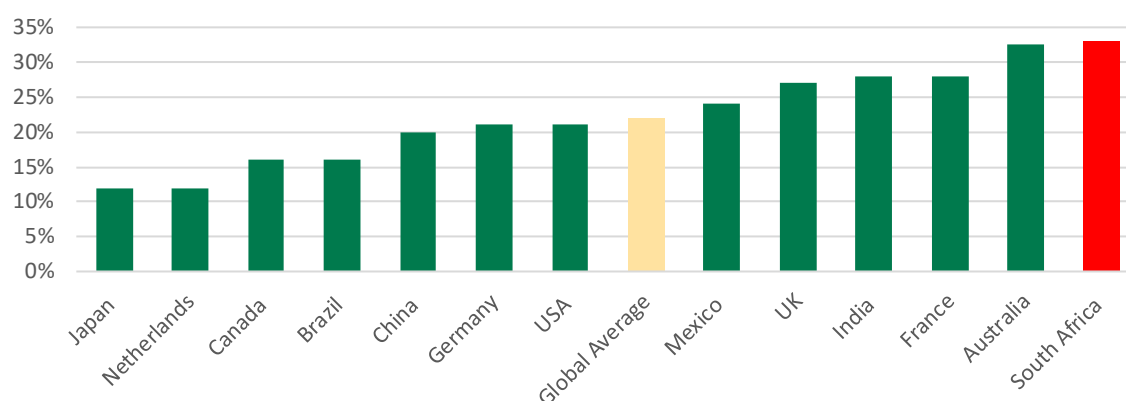
¹⁹ RIA. (2017). The State of ICT in South Africa

²⁰ SME South Africa (2018). An Assessment of South Africa's SME Landscape

²¹ Ookla (2019). Speedtest Global Index

²² Online Media (2018) - *How technology is reshaping South Africa's small business economy*, Xerox & World Wide Worx

Figure 5: Share of respondents reporting a slow internet connection²³



Source: Regus, 2017

Survey data assessing individual access to fixed line networks is robust and nationally representative. While the readiness condition reflects the extent of fixed line coverage, more could be done to assess the relevance of this measure for businesses seeking to compete in the digital world as alternatives connections offer increasing quality. Data relating to business access is drawn from a narrow survey.

Supplementary data and empirics:

- A nationally representative survey of business perspectives on ICT access. This would contain measures of the cost burdens of the various options and the self-perceived preference across options.

²³ Regus (2017). The workplace revolution

Mobile network coverage and quality



Most South Africans access the internet through mobile connections that leverage South Africa's high levels of mobile network coverage. Approximately 99.9%²⁴ of South Africa's population have access to mobile networks - in 2018 South Africa's largest operator, Vodacom, had 3G and 4G network coverage reaching 99.97% and 80% of the population respectively while MTN's 3G coverage reached 98% of the population. 4G coverage has accelerated rapidly as only 53% of the population were covered in 2015²⁵. Mobile network access is particularly important as 43% of connected households do so through a mobile phone.²⁶ South Africa's mobile operators continue to make substantial investments in network infrastructure to carry the high volume of data transmitted by bandwidth hungry applications. In the 2017/2018 financial year total capital expenditure by the three leading operators equated ZAR 21.6 billion²⁷

Mobile broadband connections are in certain instances faster than fixed-line connections and are generally reliable. Average mobile download speeds are estimated at 29 Mbps. These are above global averages and place South Africa at 54 of 138 markets²⁸. Vodacom and MTN continue to improve their 3G and LTE network quality with MTN's 4G network having the capacity to offer speeds of 70 Mbps. ICASA conducts Quality of Service assessments across provinces which measures call and data service quality and reliability. Voice related assessments illustrate a moderate frequency of missing stringent quality targets and disparities in quality between provinces. KPIs such as speed and stability are used in the assessment of data services also illustrate variation within and between provinces. While differences in performance between service providers are highlighted, no frame of reference is provided to meaningfully assess service quality.

The entrance of MNOs such as Cell C, Telkom ('8ta') and Rain has increased competition in the mobile market to the benefit of consumers. MNOs have embarked on initiatives such as Cell-C zero-rating WhatsApp and Vodacom and MTN zero-rating Twitter, Facebook and other educational content. Rain - a data-only network who entered the market in 2018 – is expected to launch 5G this year which places South Africa on par with global adoption of 5G networks²⁹.

The coverage of mobile networks was cross-verified between reports from mobile operators, the World Bank and the ITU – a globally recognised source. The ITU offers ease of cross-country comparison, however Research ICT Africa demonstrates that some of the ITU's measures may be subject to bias.

²⁴ WEF (2017). Global IT Report

²⁵ ICASA (2018). 3rd Report on the State of the ICT Sector in South Africa

²⁶ RIA. (2017). The State of ICT in South Africa

²⁷ Operators annual reports 2017/2018

²⁸ Ookla (2019). Speedtest Global Index

²⁹ Online Media (2019) - Rain and Huawei launch South Africa's first commercial 5G network - BusinessTech

Affordability

The ability for South Africans to use the internet to access economic opportunities depends on the affordability of internet-enabled devices and data. South Africa ranks below the world median and BRICS averages for the affordability of ICT services³⁰ and suffers particularly in terms of data costs. Given these high costs, lack of momentum and relevance data has in everyday lives, the readiness gap remains large and static. Market structure, regulation and policy will be key players in driving cheaper data prices.

Data



Poor price competition among MNOs is driving the high costs of prepaid mobile data bundles. The cost of data is high relative to continental comparators - the cheapest domestic 1GB of prepaid mobile data bundle costs 600% more than the cheapest 1GB in Egypt and 134% more than BRICS nations.³¹³² Mobile data costs are a hindering factor for the poor and average income individuals who are subsequently unable to access the full experience and benefits of the internet. Approximately 15% of individuals reported that the main reason for limited use of the internet was the cost of data while others estimate that more than half of South Africans would need to spend 15% to 40% of their income to buy 1 Gb of data³³³⁴. While data costs fell from 2014 to 2015, this decline halted and continues to remain too high.³⁵

An oligopolistic market which lends to poor pricing competition between mobile operators contributes to the high data costs. The mobile network's Herfindahl-Hirschman index - a measure of market concentration – reflects a concentrated market with Vodacom's data revenue share at 40%, followed by MTN at 34% and Cell C at 30%.

³⁰ WEF (2017). Global Information Technology Report

³¹ RIA. (2017). The State of ICT in South Africa

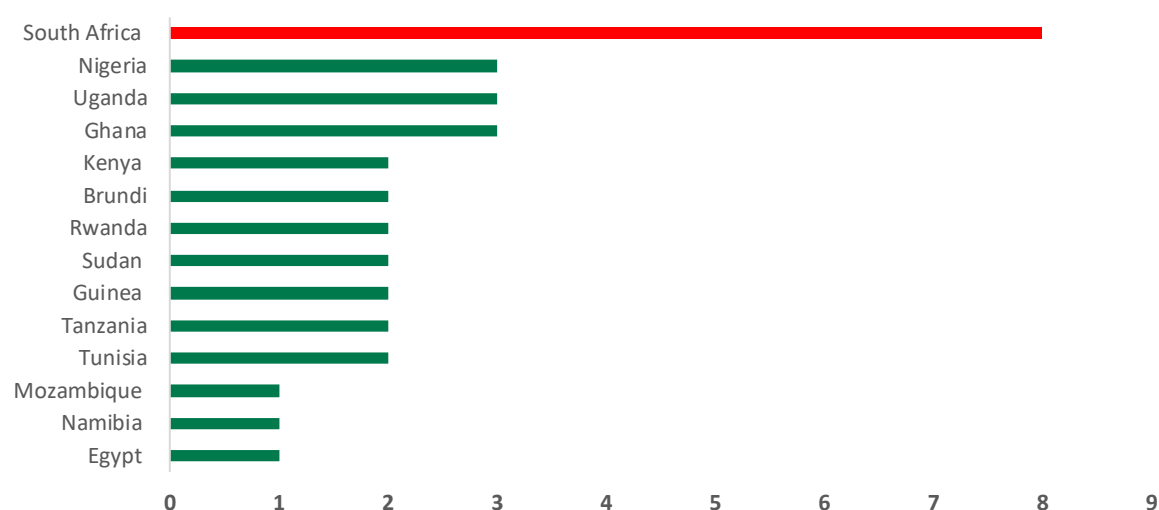
³² Online Media (2018) - *High Data Costs Challenged – Low Income Households Hit the Hardest* – CityPress

³³ Online Media (2018) - *High Data Costs Challenged – Low Income Households Hit the Hardest* – CityPress

³⁴ Online Media (2018) - *Data Must Fall: Inquiry hears how exclusionary data prices are* - IOL

³⁵ RIA. (2017). The State of ICT in South Africa

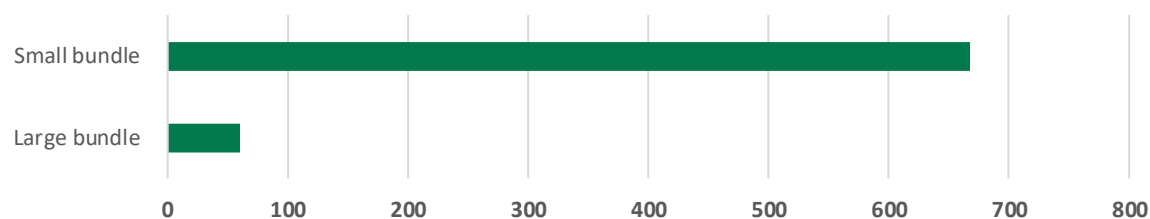
Figure 4: Cost of 1GB in African countries (USD)



Source: RIA After Access Survey, 2017

Low-income earners are paying disproportionately higher costs for small packets of data as costs are higher for smaller bundles. Rain aims to provide consumers with cheaper data using a flat rate pricing strategy³⁶. However, Rain currently has coverage in a limited number of urban areas.

Figure 5: Price per Gigabyte of data (ZAR)



Source: Jamlab, 2018

The lack of access to competing infrastructure for low income consumers decreases data competition, allowing MNOs to charge exorbitant prices. Fixed line and fibre connectivity are low to non-existent in some low income and rural communities. Businesses in areas without fixed line connections struggle to compete because they are reliant on expensive mobile connections – 1 GB of mobile data is double the price of a GB of ADSL data.^{37,38} The data must fall campaign is seeing traction in assessing the competition dynamics in the data market.

³⁶ Rain.co.za

³⁷ Online Media (2018) - 1GB mobile data prices in South Africa – No price drops in sight - Mybroadband

³⁸ Online Media (2018) - MWEB to charge R49 for 1GB of ADSL data - Mybroadband,

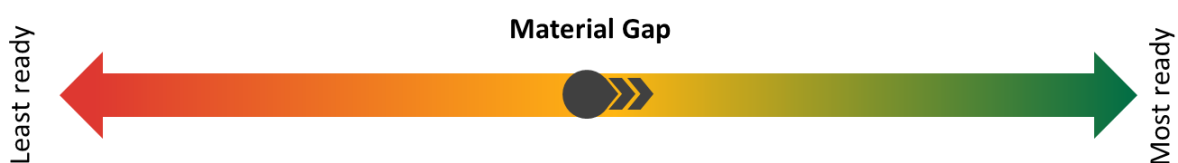
Municipalities are providing residents with free, capped WiFi to increase access for marginalised individuals to affordable and high-quality internet³⁹. South Africa leads the continent in the provision of free internet access to citizens with more than 2,000 hotspots in nearly 60 cities⁴⁰. *The City of Tshwane* had more than 1 million unique devices using free WiFi in 776 public hotspots in 2018. The municipality provided residents with 1,500 km of free broadband fibre capped at 500MB, allowing individuals to use the network for learning, working and job-hunting. *The City of Johannesburg* provides free WiFi at over 300 hotspots capped at 300MB per user with unlimited access to services. *The City of Cape Town* entitles user to 250 MB of data and unlimited access to government websites. Residents can buy data cheaper than through MNOs -R700 MB costs R5, 2GB costs R15 and 7GB costs R45. *The City of Durban* provide residents with access to free WiFi with a key focus on providing this service in townships and rural areas where the majority of access-constrained individuals reside.

Public discourse, cross-country comparison, and assessments of data pricing all allude to the unaffordability of data for the majority of South Africans and the subsequent impact this has on inclusivity. While these measures provide evidence that there is a data affordability gap, more can be done to quantify the impact of this gap.

Supplementary data and empirics:

- Survey data should seek to quantify the impact of data costs by measuring the share of income spent on data across a range of digitally enabled and non-digitally enabled jobs. This should equally be conducted for business and surveyed annually.
- These findings would help unpack the data requirements across these different jobs and opportunities.

Devices



Mobile phones are the most popular devices used to access the internet however the high cost of smartphones relative to disposable income inhibits universal access. Approximately 72% of the population use a mobile phone as the sole device connecting many low-income individuals⁴¹. While smartphones are becoming cheaper, they are still unaffordable for lower income individuals. This is despite the 41% fall in average prices since 2012⁴². This impedes internet access as 36.2% of non-internet users cited the lack of internet connected devices as the main inhibitor to internet access. A geographic divide also exists in terms of smartphone ownership, with 54% of the urban population owning smartphones versus 33% of those in rural areas.⁴³ The total figure for smartphone access falls far short of the OECD average of 70% to 80%⁴⁴.

³⁹ National Treasury (2018). Service Delivery review

⁴⁰ ITC (2018). Business Ecosystems for the Digital Age

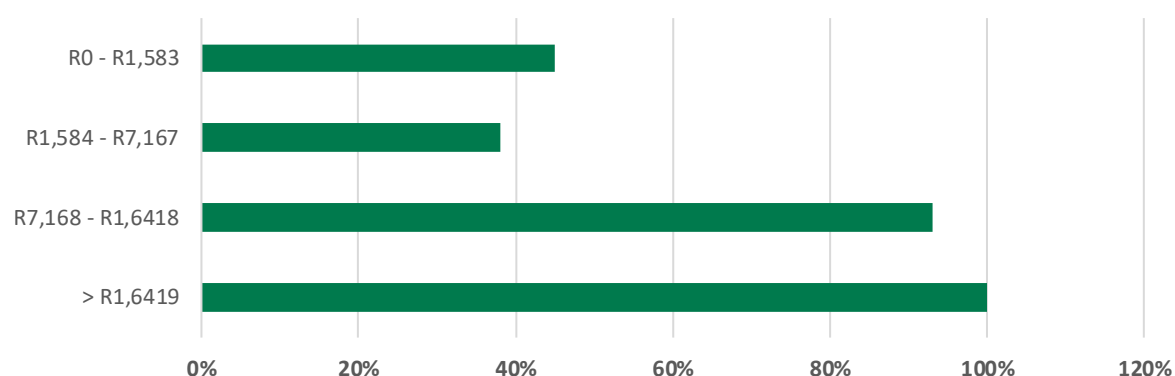
⁴¹ RIA. (2017). The State of ICT in South Africa

⁴² GSMA (2018) The Mobile Economy – Sub-Saharan Africa

⁴³ RIA. (2017). The State of ICT in South Africa

⁴⁴ RIA. (2017). The State of ICT in South Africa

Figure 3: Smartphones penetration by income ⁴⁵



Source: RIA After Access Survey, 2017

While smartphone penetration may appear high, most consumers have low-feature smartphones which fit the narrow smartphone definition and have limited capabilities. Smartphones have WiFi connectivity, web browsing capabilities, a high-resolution touchscreen display and the ability to use apps. Approximately 61% of smartphone sales in South Africa in 2018 were low-end smartphones costing less than R1,500.⁴⁶ Most of these low-end devices use AndroidGO, an operating system for devices with low RAM, slow internet connection and low-end CPU. These phones therefore have limited capabilities - for example, the phone can use WhatsApp but cannot support a banking app.⁴⁷ Individuals seeking to access income generating opportunities that require smartphone capabilities are therefore disadvantaged. Inequality in opportunity is therefore embedded along the same dimensions as inequalities in smartphone penetration – income, geography and gender.

Smartphone distribution networks that limit the benefits of price competition between mobile phone brands may be contributing to inflated device costs. Markets such as China have multiple producers of affordable smartphones that compete with established smartphone producers like Apple, Samsung and Huawei⁴⁸. However, the distribution chains in South Africa are focused on pricier smartphones from established brands, and many of the new market players are not distributing their phones in South Africa. As these smartphones are imported from outside the Southern African Custom Union, they are subject to a 10% luxury item mark-up and an ad-valorem luxury good excise duty of 9%.⁴⁹ Removing this excise duty could have a considerable effect on the price of devices. In addition to this, scaling

⁴⁵ Note: *The initial income bracket is inflated as the survey includes students at secondary and higher education institutions in the no-income band*

⁴⁶ More than 13 million new smartphones were sold in South Africa last year – and almost two-thirds cost less than R1,500 according to Business Insider, 2019

⁴⁷ Android platform (2019). SocialCompareBeta

⁴⁸ Online Media (2018) - *The Chinese smartphone companies taking on Apple and Samsung like never before* - Mybroadband

⁴⁹ SARS (2019). Duties and Taxes for Importers.

affordable devices manufactured in South Africa such as the Mara smartphones, could improve access to affordable, high-quality smartphones.⁵⁰

Measures of device penetration are robust and derived from Research ICT Africa – an entity funded by the IDRC and dedicated to measuring and assessing ICT access and dynamics. This is combined with insights drawn from alternative sources however these measures can be supplemented to understand the specific requirements users need in terms of functionality and therefore better determine the scale of the gap.

Supplementary data and empirics:

- Interviews with consumers and businesses operating platforms would provide insight into device requirements. This would unpack the degree to which low functionality phones are an impediment and could be overlaid with the insights of local phone producers to coordinate development.

Telecommunications regulation



The primary legislation governing the electronic communications sector in South Africa is the Electronic Communications Act 36 of 2005 (the “ECA”). The Act together with the Electronic Communications Amendment Act 1 of 2014 covers all aspects of the regulation of electronic communications markets including licensing, infrastructure deployment and access, the management and assignment of frequency spectrum, technical standards, interconnection and competition. In addition, the Independent Communications Authority of South Africa (ICASA) was established in 2000⁵¹ to regulate the electronic communications sector and perform the duties envisaged in the ECA.

Notwithstanding this regulatory regime, it is generally acknowledged that there are significant regulatory bottlenecks and competition issues that are hindering affordable access to electronic communication services. These issues were most recently highlighted in the Competition Commission’s April 2019 Provisional Findings and Recommendations in the Data Services Market.⁵² The report highlights the following regulatory bottlenecks as hindering affordable access:⁵³

First, a lack of spectrum and cost-based facilities access is driving high mobile service provision costs. Significant delays in the release of high-demand, low frequency spectrum by ICASA for use by mobile networks has resulted in increased costs for such operators. This is because mobile network operators must compensate for the lack of spectrum via increasing capital expenditure on physical base station infrastructure to cope with rising data traffic demands on their networks. In addition, service provision costs are also impacted by a lack of cost-based passive infrastructure sharing on the part of large incumbents. Whilst ICASA has previously put in place regulations governing facilities access, these regulations do not cover

⁵⁰ Online Media (2019) - South Africa to build first ‘affordable’ smartphone - BusinessTech

⁵¹ ICASA Act 13 of 2000

⁵² Competition Commission, Data Services Market Inquiry: Provisional Findings and Recommendations, 21 April 2019.

⁵³ Competition Commission, Data Services Market Inquiry: Provisional Findings and Recommendations, 21 April 2019, p.8-19.

all facilities (such as ducts and poles), they do not deal with constructive refusals nor do they regulate the price at which access is provided.

Second, competition could be improved, particularly in the case of mobile markets, by regulating wholesale access. Retail electronic communication markets have remained relatively concentrated over time with market failures and a lack of wholesale access regulation tending to exacerbate first mover advantages. In particular, in the case of mobile markets the terms on which roaming agreements and wholesale network access has been provided by incumbents to smaller players have historically not been conducive to the introduction of effective competition. This is also supported by the fact that the 2017 ICASA Priority Markets Study found that wholesale fixed line access, upstream infrastructure (national transmission and metropolitan connectivity and relevant facilities) and mobile services are markets that are likely to exhibit ineffective competition and hence should be prioritised for potential regulatory market reviews.⁵⁴

There have been a number of indications that the sector regulator is seeking to address the identified regulatory bottlenecks⁵⁵ however, past experience and current regulatory and policy uncertainty suggests that change is unlikely to be forthcoming. Indeed, the ICT policy and regulatory landscape has been complicated by Departmental restructuring and the withdrawal of the Electronic Communications Amendment Bill from parliament. Importantly, the latter was set to be sector-changing legislation that sought to translate current Government policy into legislation and also reduce what are seen as onerous pre-conditions for regulation. Its withdrawal is thus likely to lead further delays in implementing regulatory imperatives.

Telco regulation was analysed by an expert team of competition economists and relies both on nuanced insight and interpretation of regulation.

⁵⁴ ICASA, Summary of the Findings on the Inquiry into Priority Markets in the Electronic Communications Sector, 17 August 2017, Government Gazette Vol. 638, No. 41847 p.7.

⁵⁵ These include undertaking both a Priority Market Study to identify markets that should be prioritised for regulation and subsequently initiating its own Data Market Inquiry (currently underway).

Human Capital



The South African labour market has historically struggled with labour mismatches - there are not enough graduates learning relevant skills for a digitally oriented economy.⁵⁶ South Africa ranks 88 of 130 countries in the WEF Human capital report, let down by performance measures for young adults⁵⁷. In 2016 the total number of graduates in public Higher Education and Training (HEI) institutions was little over 200,000, which is a 39.7% increase from 2009. Private HEI contributed 40,000 graduates in 2016 with nearly a third graduating with a bachelor's degree or advanced diplomas.⁵⁸ However, graduates trained in these areas often lack practical work and the creation of relevant skills. This skill shortage has led to job vacancies and has hindered economic growth.

South Africa has many educational pathways and skills development programmes that can be leveraged to scale the supply of quality skills. Higher education institutions, Technical and Vocational training as well as micro-credentialing institutions are the most common educational pathways in South Africa. These pathways provide a broad spectrum of options for South African learners and differ by the type of programmes offered, entrance requirements, delivery methods and tuition costs.



This includes 26 public higher education institutions, 123 private higher education institutions, 50 Technical and Vocational Education and Training (TVET), 279 registered private colleges and 9 community education and training (CET) colleges. A number of micro-credentialing institutions such as Careerbox, EOH, Maharishi Institute and the Mentec Foundation are also emerging. Open online learning platforms such as Coursera, Allison, LinkedIn learning and Udemy are seeing significant growth.

This wide range of educational pathways is not necessarily resulting in effective youth job placements. The graduate unemployment rate is approximately 33.5% for those aged between 15–24, and 10.2% among those aged 25–34 years.⁵⁹ Students are being prevented

⁵⁶ Genesis Analytics Team Analysis 2019

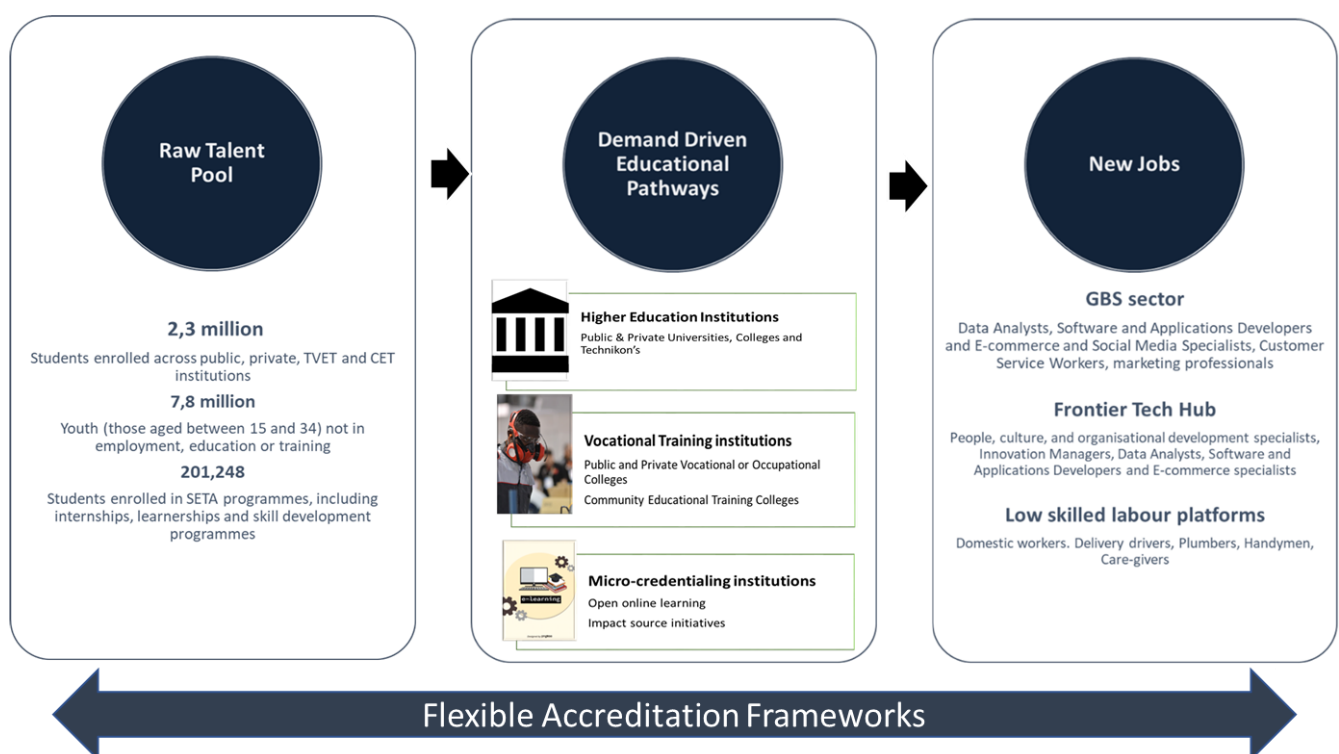
⁵⁷ WEF (2017). Human Capital Report

⁵⁸ DHET (2016) Statistics on Post-school education and Training in South Africa

⁵⁹ Statistics South Africa, 2018

from transitioning into educational pathways that translates into a jobs due to issues in accessing educational pathways, poor articulation between pathways and a lack of flexible and demand driven content.

There are a number of key inputs that South Africa must get right to scale its supply of quality talent for new jobs: firstly, the availability of a large raw talent pool; secondly the presence of a high quality schooling system that provides this talent pool with foundational capabilities; and thirdly that this talent pool can access demand-driven educational pathways that are fit for the job market. The state of play for each of these inputs is discussed in more detail in the remainder of this section. In terms of demand-driven educational pathways, funding, accreditation, providers and the business sector are investigated. Finally, attracting and maintaining critical talent as a solution to the skills gap is investigated.



Raw talent supply for emerging jobs



South Africa has a large raw talent pool that can be leveraged to scale the supply of quality skills. The total raw talent pool is around 10.3 million. This includes unemployed youth and the total number of enrolments in the various educational pathways. According to the Department of Higher Education Training (DHET) there were about 2.3 million students enrolled across public, private, TVET and CET institutions in 2016. There were also about

200,000 students enrolled in SETA programmes, including learnerships, internships and skills development programmes. Approximately 30% of these students were enrolled in SET Programmes.⁶⁰ The biggest source of this raw talent pool is the 7.8 million youth (aged between 15 and 34) that are not in employment, education or training.

The Oxford School of Economics in their report on Global Talent consider South Africa among the 10 countries expected to produce the largest skills supply by 2021. This puts South Africa in 4th position in the global rankings after India, Indonesia and Columbia in terms of skills that can be effectively tapped into.⁶¹ Whereas nations such as Japan and Canada suffer from an aging population, South Africa is unlikely to be in shortage of talent and is at a demographic advantage⁶². South Africa also has a large number of unemployed high school drop-outs and matriculants.⁶³ This large raw talent pool can form part of the input into demand driven educational pathways as the demand for new types of skills increases and new economic opportunities emerge. However, this large supply of raw talent is an indication of the availability of individuals who can be trained and not necessarily an indication of the quality of skills. Education is required to deepen and enrich the capabilities of these individuals.

Estimates of South Africa's demographic trajectory are fit for comparison with other markets and derived from a reliable source. The assessment acknowledges the risk of a growing youth population if income opportunities do not scale comparatively, however the assessment approaches the measure from an opportunity lens.

Basic and secondary schooling



The output of South Africa's basic and secondary schooling is dangerously low, stemming both from critically poor enrolment and completion rates. As of 2016, 16% of children aged 5-14 were not enrolled in any form of basic or secondary schooling. As a benchmark, the OECD average is close to 100% for this age group, and South Africa ranked last amongst 43 OECD partner countries.⁶⁴ Moreover, only 30% of students who enrol in grade one actually make it to and pass matric with weaker progression likelihood for previously disadvantaged races⁶⁵. Between grade 11 and grade 12 alone, 29% of male and 13% of female students stopped their schooling.⁶⁶ These poor completion statistics are reflected in the fact that 19% of people between 25 and 64 have no schooling beyond grade seven.⁶⁷ These two factors compound to

⁶⁰ DHET (2016). Statistics on Post-school education and Training in South Africa

⁶¹ Oxford Economics (2012) Global talent 2021-How the new geography of talent will transform human resource strategies.

⁶² Oxford Economics (2012) Global talent 2021-How the new geography of talent will transform human resource strategies.

⁶³ Human Resource Development Council for South Africa (HRDC) (2014). TVET Colleges In South Africa: Pathways Work-stream

⁶⁴ OECD (2018) Education GPS <http://gpseducation.oecd.org/CountryProfile?primaryCountry=ZAF&treshold=10&topic=EO>

⁶⁵ StatsSA, 2016, Education Series Vol III

⁶⁶ StatsSA, 2016, Education Series Vol III

⁶⁷ StatsSA, 2016, Education Series Vol III

create a crisis, leaving large percentages of the youth without even basic educational training.⁶⁸

Even for those who enrol in and complete primary education, the quality provided is very poor. South Africa's basic education systems are not effective at instilling even the most fundamental numeracy and literacy skills. As of 2016, 78% of grade 4 learners were classified as illiterate by The Progress in International Reading Literacy Study. This makes South Africa the worst performing nation of the 50 that were measured.⁶⁹⁷⁰ Similarly, Nationally representative surveys (TIMSS-N 2015) show that only 61% of Grade 5 learners could do basic mathematics, while the quality of maths and science education is considered by surveyed executives as far below BRICS averages.⁷¹⁷² This poor quality does not improve as learner's continue through basic and secondary schooling. In 47% of high schools no pupil performed at the intermediate international mathematics benchmark. To contrast, this occurred in only 2% of high schools in Botswana.⁷³ Moreover, in 2017 only 29% of students pass matric with high enough marks to qualify for university entry.⁷⁴

There are instances of high performing public schools and generally better performing private schools however capacity in these public schools is limited while a narrow portion of the population can access private schools. The private schooling sector has its own curriculum, is better staffed and resourced, and less prone to overcrowding. In 2018, the system had matric pass rates of nearly 98% in contrast to the 78% of public schools. Of the top performing 200 schools, 185 are former white only schools which are better resourced and concentrated in urban and peri-urban locations⁷⁵. Access to private education is constrained by space and higher costs⁷⁶. Inequality in access to performing institutions translates into inequality in student performance – 84% of Grade 5 learners who attend independent schools understand mathematics at international benchmarks in contrast to 67% in public schools charging fees and 25% in fee-free schools. This incurs discrepancies along racial lines with 85% of white learners in contrast to 48% of black learners meeting these benchmarks. This leads to imbalances in access to tertiary education - independent schools have a bachelor pass rate of 51.3% while public schools have a rate of 37.6%⁷⁷.

⁶⁸ StatsSA, 2016, Education Series Vol III

⁶⁹ Kubheka (2017) 78% of Grade 4 Pupils in SA Are Illiterate – Online at EyeWitness News

⁷⁰ [PIRLS \(2016\) International Results in Reading](#)

⁷¹ Spaul (2019). Hijacked by the urgent, we neglect the important

⁷² WEF (2018). Global Competitiveness Survey

⁷³ [PIRLS \(2016\) International Results in Reading](#)

⁷⁴ Education Statistics (2019). South African Market Insights, <https://www.southafricanmi.com/education-statistics.html>

⁷⁵ Vally (2019) – *Educational Inequality: The Dark Side of SA's Education System* – Online Media – Daily Vox

⁷⁶ Online Media (2019). – *How Matric Results reflect the inequalities of public and private education* – News24

⁷⁷ StatsSA (2017) Education Series Volume V – Higher Education and Skills in South Africa

The schooling system provides inadequate support for helping learners plot their post-school educational pathway. Learners choose subjects in grade 9 that will determine what higher education programmes and institutions they will qualify to attend. These choices are constrained by a lack of proper post-school guidance from schools and parents. School guidance programmes are not comprehensive - particularly in disadvantaged schools - while student decisions are at risk of being based on negative perceptions of some pathways, a desire for white-collar jobs rather than blue-collar jobs and the experiences of respected members in their communities. Colleges are seen as inferior institutions and TVETs are seen as an easy alternative to finishing high school. TVETs are also regarded as institutions for students with poor academic performance who will only be able to access menial artisan jobs⁴ As a result, many learners enter educational pathways that they are not prepared for, which contributes to high drop-out rates.

Analysis of primary and secondary educational performance relies on insights drawn from StatsSA analysis of nationally representative samples and cross-country benchmarking. There is a rich availability of data relating to educational outcomes however little analysis of tech related skills of the youth.

Supplementary data and empirics:

- A pilot survey to assess the baseline digital skills level of students in hard areas such as coding, and softer areas such as awareness of the risks of the internet.
- Cross-country assessment of the success and impact of curriculums introducing digital-relevant subjects such as coding and robotics.

Access to educational pathways



The costs of attending traditional post-school education pathways act as a barrier for many youth and are particularly limiting for previously disadvantaged races. These costs include tuition fees, accommodation, meals, books, stationery and transport. Tertiary education costs have traditionally risen at 2% above CPI while StatsSA has estimated that nearly 51% of youth 18 to 24 do not have the funds to pay their tuition⁷⁸⁷⁹. Worryingly, financial barriers to access differs along racial lines: 53% of black African youth cite a lack of finance as the reason for not attending post-school, above the national average and the 28% average of white youth.⁸⁰ The lack of availability of finances was estimated to be the cause of 48% of dropouts in 2010.⁸¹ Financial barriers to HEI force a large stream of youth to attend TVETs as financial constraints in TVETs are not as binding as in Universities due to subsidies from government that cover 80% of the costs of official college programmes. TVET attendance is racially skewed – while

⁷⁸ StatsSA (2019) Higher Education and Skills in South Africa

⁷⁹ StatsSA (2016) Tertiary Education Inflation Index

⁸⁰ StatsSA (2017) Education Series Volume V – Higher Education and Skills in South Africa

⁸¹ GTAC (NY) Post-school education and training system

nearly 72% of public HEI students are black African and 15.5% white, 92% of TVET students are black African and 1% white⁸².

Many students have to apply to the National Student Financial Aid Scheme (NSFAS) which is targeted at students who come from low-income households. Despite the doubling of NSFAS grants and loans between 2010 and 2014, many students still don't receive funding with 25% of students applying to NSFAS being rejected in 2019⁸³. For TVETS, NSFAS grant and bursaries are available to cover the 20% outstanding costs remaining after government subsidies for qualifying students.⁸⁴ This saw a quarter of a million students in TVETs supported in 2016⁸⁵. Unfortunately, NSFAS recovery rates have fallen drastically to nearly 4% in 2014.⁸⁶

Sector	NSFAS and Subsidies ZAR	Enrolment	Funding per Enrolee
Universities	R31,1 million	668,000	R46,545
TVET	R7,8 million	702,000	R11,132

Government has been deepening its financial commitment to HEIs and broadening student access to funding. In 2015 tuition fees as a share of the total income received by HEIs had increased to 37% from 27% in 2006.⁸⁷ This was coupled with increasing HEI operating costs, resulting in an increased reliance on tuition fees. There have been some significant strides to improve access, with government committing to increase its contribution to HEIs by R17.6 billion over three years from 2016. This may improve South Africa's current ranking at 62 of 94 countries in the share of government spending dedicated to higher education – somewhat below BRICS averages⁸⁸. The government has also adjusted the qualifying criteria for NSFAS grants to increase the number of qualifying students.

Micro-credentialing institutions are a cheaper and more accessible alternative pathway, with qualifications offered at a fraction of the cost of a traditional qualification. However, access into some micro-credentialing institutions and e-learning programs is limited by access to digital devices and connectivity.⁸⁹ The Sector Education and Training Agency (SETA) provides business with funding for sector specific training programs of which micro-credentialing programs could form part. Disbursement of SETA funding has been below budget leading to the DHET attempting to incentivise SETAs to allocate more funds to HEIs and TVETs.⁹⁰

Providers of educational pathways

South Africa's youth are not being equipped with the necessary skills to successfully find employment due to a lack of demand driven educational pathways. There are issues with

⁸² DHET (2016) Statistics on Post School Education and Training in South Africa

⁸³ NSFAS Online FAQ

⁸⁴ Hofmeyr et al (2017)-Post-school education: Broadening alternative pathways from school to work.

⁸⁵ NSFAS (2017). Annual Report

⁸⁶ GTAC (NY) Post-school education and training system

⁸⁷ StatsSA (2016)-Tuition fee trends over time: what do the data show?

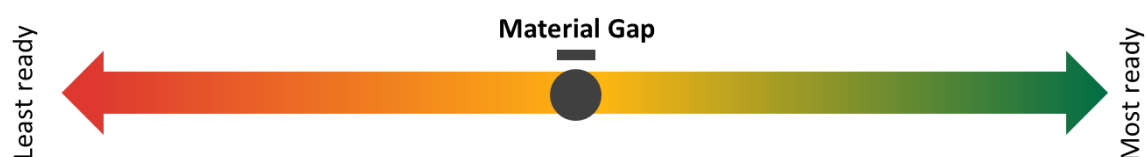
⁸⁸ UNESCO (2019) SDG Statistics

⁸⁹ Keevy & Chakroun (2018) Digital Credentialing: Implications for the recognition of learning across border

⁹⁰ GTAC (NY) Post-school education and training system

University and TVET curricula that is considered outdated, inflexible and often unable to meet the evolving skills demands of the labour market.⁴

Higher Education Institutions



South Africa has high-quality universities that provide graduates with labour market advantages however there are limits to scale. In the Times Higher Education (THE) World Universities Rankings in 2019, four of the top five universities in Africa are South African.⁹¹ The University Ranking by Academic Performance (URAP) ranks five South African universities within the top 500 in the world.⁹² Youth aged 25-29 with a college qualification are 14% more likely to be employed, while those with a university qualification are 36% more likely to be employed.⁹³ Similarly, students that hold a college or university qualification will likely earn more. Universities have a fixed capacity with only 10% of youth (1.2 million students) enrolled in a university or college⁹⁴.

HEIs are producing skills relevant to the digital age however curriculum improvements are necessary. There has been an upward trend in the number of graduates in Science, Engineering and Technology (SET) resulting in the majority of graduates coming from these programmes at 29.1%. UNESCO estimates that South Africa ranks 60 of 93 countries in the share of students graduating with these degrees.⁹⁵ Despite this, there are issues with University curricula which are too inflexible to meet the labour market's demand for rapidly changing skills - curricula is outdated with the current structure adopted nearly a century ago^{96,97}. The scale, bureaucracy and legacy operations of universities limit institutional flexibility and agility. Additionally, almost half of higher education students do not complete their qualifications - deteriorating significantly over the past decade⁹⁸. Rates of access, success and completion are also worryingly racially skewed^{99,100}

⁹¹ Times Higher Education (2019) Times Higher Education's World University Rankings

⁹² Informatics Institute (2019) *University Ranking by Academic Performance*

⁹³ Branson, Hofmeyr et al (2017)-Post-school education: Broadening alternative pathways from school to work.

⁹⁴ DHET (2016)..Statistics on Post-school education and Training in South Africa

⁹⁵ UNESCO (2019) SDG Statistics

⁹⁶ Council for Higher Education (2013). A Proposal for Undergraduate Curriculum Reform in South Africa

⁹⁷ Branson, Hofmeyr et al (2017)-Post-school education: Broadening alternative pathways from school to work.

⁹⁸ GTAC (NY) Post-school education and training system

⁹⁹ Council for Higher Education (2013)., A Proposal for Undergraduate Curriculum Reform in South Africa

¹⁰⁰ Council on Higher Education (2016) Vital Stats Public Higher Education 2014

Technical and Vocational Education and Training



South Africa has a large TVET sector with complex institutions however there are significant issues in the relevance of content.¹⁰¹ Although less than HEIs, enrolment in TVETs nearly doubled between 2010 and 2016, reaching more the 700,000 students.¹⁰² TVETs have the most significant curriculum issues among the educational pathways: these institutions have limited autonomy in their education and training provision which affects their ability to develop relevant pathways to (self) employment, occupations and further learning. Some lecturers have also lost relevant ties to industry and are not always up to date with the latest occupational skill demands.¹⁰³ Frequently lecturers have emerged through the technical qualification route and have little to no practical experience at all¹⁰⁴.

More than half of learners in TVET colleges are not getting any work experience while throughput is alarmingly low.¹⁰⁵ The lack of work experience provided to students is a significant impediment as students with practical experience have 82% better odds of finding work¹⁰⁶. Colleges are not effectively managing the development of practical skills, either in the workshops or in workplaces. As such there are only a few TVET colleges that are demand driven and reflective of the interests and requirements of business.¹⁰⁷ In addition certification rates are poor – nearly 2% of students who begin an NC(V) at level 2 complete the qualification in 3 years, and only 10% in six years.¹⁰⁸ These rates are lowest for technically demanding course such as IT or engineering. This leads to high costs per graduate – although spending per learner per year is estimated at R27,000, the cost per graduate likely exceeds R450,000.¹⁰⁹ A ministerial task team is investigating the overhaul of the TVET system in response to these challenges.¹¹⁰

Accreditation of educational pathways qualifications



The NQF sets the articulation between different qualifications while SETA defines funding allowances for sector-specific continued learning. For the NQF, this is achieved through an

¹⁰¹ DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

¹⁰² DHE (2016) Statistics on Post-School Education and Training in South Africa

¹⁰³ Human Resource Development Council for South Africa (HRDC) (2014) TVET Colleges In South Africa: Pathways Work-stream

¹⁰⁴ DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

¹⁰⁵ DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

¹⁰⁶ DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

¹⁰⁷ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

¹⁰⁸ GTAC (NY) Post-school education and training system

¹⁰⁹ GTAC (NY) Post-school education and training system

¹¹⁰ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

integrated national framework for learning achievements across institutions. Under the NQF, degrees can only be attained from universities (traditional, comprehensive or university of technology), while diplomas and certificates are attained from universities and colleges. SETAs provide funding for sector specific skill development programmes such as in the banking sector and in the media and ICT sectors.

The transition from TVETs to universities is constrained by the lack of cooperation between these institutions. Some universities are reluctant to enrol graduates with a National Certificate-Vocational (NCV) and argue that their qualification is equal to a matric.¹¹¹ This forms part of a lack of clarity regarding entry routes and exit routes in and out of TVETs, specifically whether it be to HEI, employment or self-employment. The private sector also holds negative perceptions about the quality of these graduates and thus these graduates struggle to find employment. This inadequate articulation between qualifications as well as programmes that span more than one sub-qualification framework, leads to dead ends for learners. This highlights the need for clear institutional arrangements that are binding to all institutions. SAQA is currently prioritising the promotion of articulation between qualifications across the 3 sub-frameworks of the NQF to facilitate lifelong learning and access to the workplace. Universities have also created bridging programmes to assist underprepared students gain the skills that weren't transferred in previous learning pathways. However, these efforts have not yet translated into a smooth articulation between pathways.

Inflexible accreditation frameworks limit the ability for alternative educational pathways to absorb the large availability of raw talent and prepare them for the job market. Accreditation mechanisms remain inflexible leading to a lack of recognition and support for non-traditional educational pathways and micro-credentialing. Micro-credentialing institutions are considered the most flexible and demand driven with some being sector specific and others being open content providers. The acceptance of micro-credentialing initiatives in South Africa is behind global trends however there is evidence of growing appetite from business. Most micro-credentialing institutions struggle for recognition under the national qualification framework (NQF) or Sector Education & Training Authority (SETA) accreditation framework: the NQF recognises degrees, diplomas and certificates from universities, colleges and TVETs while SETA funding requires that programmes fall under their accreditation standards.¹¹² It appears that there is no clear plan to integrate emerging micro-credentialing programmes into the SETA accreditation standards, and without this accreditation, businesses find it difficult to access SETA funding to scale training partnerships with these micro-credentialing institutions.⁸¹¹³ There are instances of demand driven micro-credentialing institutions that have been successful in producing accelerated skills for businesses however the industry is yet to scale. Accreditation mechanism will need to become more flexible to respond to rapidly changing labour market demands and to allow the training

¹¹¹ Makura & Nkonki (2017)-Constraints and enablers of articulation from further education and training colleges to Universities: Perceptions from South Africa

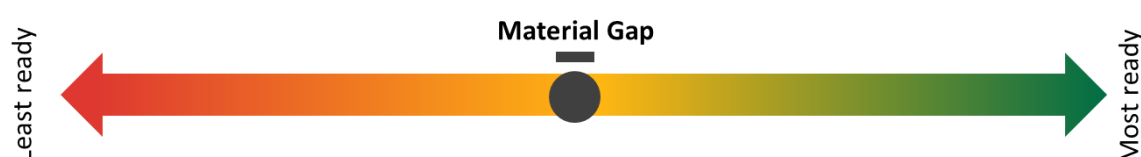
¹¹² Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

¹¹³ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

sector to offer a variety of programmes that accommodate emerging and forthcoming digital jobs.

The cost of developing within-business upskilling programs has been a key inhibitor to uptake. The lack of SETA accreditation of cost-effective micro-credentialing institutions may be a contributor to inflated skills training costs for business. South African business spends nearly 4 times the payroll expenditure required by the Skills Development Levies Act while firm investment in staff training is on par with BRICS nations ranking 55 of 140 countries^{114,115,116}. In select instances SETA has accommodated these costs however SETA accreditation expectations are restrictive. As of 2014/15, approximately 12,000 learners were funded through SETA – down from ~19,000 in 2012/13.¹¹⁷ Business use of cost-effective open digital content and the development of internal micro-learning content has been neglected relative to the reliance on external service providers who may however be providing more bespoke solutions.¹¹⁸

Business contribution to educational pathways



The private sector participates in the development of youth human capital through three channels. Firstly, industry can support students' studies through bursaries and scholarships. Secondly, business can support the readiness of students for business through internships and practical experience during studies. Finally, business maintains and deepens staff capabilities through on the job-learning.

The private sector is a key source of student support however better coordination with the education cluster is required. South African corporates disburse bursaries and scholarships for students studying in relevant fields. These bursaries may cover all or part of a student's studying expenses. As of 2013, a representative sample of corporate funders disbursed nearly ZAR 500 million to more than 100,000 students.¹¹⁹ As the number of high achieving students from financially disadvantaged backgrounds is limited, these corporate funders compete for a relatively small pool of qualifying subsidy/bursary recipients.¹²⁰ Lack of coordination between corporate funders and between corporates and educational institutions often sees high performing, qualifying students being awarded multiple bursaries.¹²¹

South African businesses are developing student readiness for the workforce through internship programs. While empirical data on the South African internship landscape is scant,

¹¹⁴ WEF (2017). Global Competitiveness Index

¹¹⁵ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019

¹¹⁶ Online Media (2019). - *South African Board for People Practices - State of the South African Training Industry Report*. – TD Magazine

¹¹⁷ GTAC (NY) Post-school education and training system

¹¹⁸ Deloitte. 2016. Human Capital Trends Report for South Africa

¹¹⁹ HRDC (2013), Status of the Bursary/Scholarship Funding Landscape in South Africa.

¹²⁰ GTAC (NY) Post-school education and training system

¹²¹ Genesis analytics interview

international studies demonstrate the value of internship programs for students: they provide to-be employees with networks, experience, mentorship, soft-skills and increase the likelihood of receiving full-time job offers.¹²² In South Africa, more than 50% of a sample of graduate interns felt that it provided support in the development of their career paths.¹²³ Unfortunately, interns are also a transient and cheap source of labour which in many instances leads business to make use of interns without the explicit intent of hiring them – 42% of graduates that completed internships remained unemployed following completion.¹²⁴ In another study, only 8% of newly employed graduates attributed their job to a previous internship.¹²⁵ In addition, interns often earn far below subsistence level incomes.¹²⁶

The need for a dynamic labour force is partially being met through on the job learning however more scale is required. Surveyed South African enterprise is aware of the need for programs that keep staff skills relevant, improve their ability to pivot to new tasks, and embed a staff-wide innovation mindset – as of 2017, 83% of executives considered the concept of continued learning and career development as important or very important.^{127,128} These programs improve business agility and readiness in the digital age. Despite this recognition, only 28% of organisation are actively helping employees develop their skills.¹²⁹

Data regarding the effectiveness and scale of business involvement with academia is limited. Conclusions rely on interviews with academic coordinators. The impact and effectiveness of internships and on the job-learning is also little documented with insights drawn from a narrow survey and findings from established research bodies.

Retaining and Attracting Critical Skills



South Africa suffers from a critical skills gap that will be challenging to close in the short term. Three sources of labour mismatch plague the South Africa economy and contribute to this gap¹³⁰. Firstly, there is a *demand mismatch* where there is surplus low skills labour and a demand for high-skill labour. Secondly there is an *education supply mismatch* where there are an insufficient amount of graduates with key skills in STEM being produced by educational pathways. Finally, there is a *qualification-job mismatch* which sees graduates taking up work that does not reflect their qualification. This gap is an impediment to business with South Africa ranking 77 of 140 globally in business ability to find the skills required for vacancies,

¹²² Judy-Marie Smith (2014). *Internships – helping young people get a foot in the door. You might just be impressed by whom you let in.* – Online DGMT

¹²³ SAGDA (2013) Final Report on the Internship Baseline Study

¹²⁴ SAGDA (2013) Final Report on the Internship Baseline Study

¹²⁵ CHEC (2013) Pathways from University to Work

¹²⁶ SAGDA (2013) Final Report on the Internship Baseline Study

¹²⁷ BCG (2017). Human Capital Trends South Africa

¹²⁸ *Ibid.*

¹²⁹ BCG (2017). Human Capital Trends South Africa

¹³⁰ HSRC (2016). Skills Supply and Demand in South Africa

and 76% of businesses finding the recruitment of critical skills a challenge^{131,132}. Closing this skills gap through education is a time-consuming process – a study conducted in 2010 suggests that creating an additional 34,000 engineers, technologists, draughtspersons and technicians would take 100 years given HEI educational capacity¹³³.

This skills gap is at risk of widening as graduates leave South Africa and professional seek new opportunity abroad. The Department of Home Affairs Estimates that 7% of the country's professionals emigrated between 1989 and 2003 and that the decision to do so is increasingly shared amongst races and less concentrated among the white population¹³⁴. A global survey of 450,000 people revealed that if everyone in the sample could migrate to their destination of choice South Africa would experience a 16% net loss of skilled labour¹³⁵. In contrast New Zealand would have a net gain of 231%. This survey data is supported by the findings of The Enterprise Observatory of South Africa which found that for every one skilled migrant moving to South Africa, eight migrate out.¹³⁶ South Africa is therefore struggling to retain critical skills, ranking 75 of 125 countries in ability to retain talent.¹³⁷ This holds true for graduates, of which a recent survey found 50% of to-be graduates planned to work abroad.¹³⁸ How long they planned to work abroad was not surveyed.

South African business are exploring flexible work arrangements to ease hiring challenges. Hiring flexible workers allows employers to source high quality talent without a long-term commitment. In South Africa, more than 70% of business people are expecting to see an increase in demand for flexible workspace – above the global average of 66%¹³⁹. Nearly 73% of South African employers believe flexible work arrangements increase productivity while nearly 15% are using this as a means for skills retention^{140,141}. Business demand for flexible work is being met by a growing interest from current and emerging job seekers as South Africans are increasingly valuing flexible, non-traditional work¹⁴².

Foreign talent could be a temporary means of preventing the continued widening of this critical skills gap though this requires supportive legislation. In response to the skills-gap, local businesses are pursuing foreign talent with 76% of surveyed firms believing international sources provide a solution to expert vacancies¹⁴³. However South Africa is at a disadvantage when it comes to attracting foreign talent. This occurs along two dimensions. Firstly, high crime rates, economic volatility and comparatively high costs of living diminish our competitiveness and relative attractiveness as a destination¹⁴⁴. Secondly, migration policy is antiquated and inadequate: while a critical skills list has been developed, this list is outdated;

¹³¹ XPateWeb (2017). Critical Skills Survey

¹³² WEF (2017). Global Competitiveness Index

¹³³ Online Media (2018) – *How to fill SA's Immediate Critical Skills Gap* – BizCommunity

¹³⁴ Online Media (2017) – *Government Plans to Track all South Africans who leave the Country for Longer than 3 Months* -Business Tech

¹³⁵ Gallup (2018). Migration Survey

¹³⁶ SA Migration International (2019). [South Africa's massive immigration problem](#)

¹³⁷ WEF (2018). Global Competitiveness Index

¹³⁸ PPS (2016) Student Confidence Index

¹³⁹ Regus (2017). The Workplace Revolution

¹⁴⁰ JCSE (2018) ICT Skills Survey

¹⁴¹ Regus (2017). The Workplace Revolution

¹⁴² Vodafone Global survey, 2018

¹⁴³ XPateWeb (2017) Critical Skills Survey

¹⁴⁴ Owusu-Sekyere *et.al.* (2016) A critical skills attraction index for South Africa, Human Sciences Research Council,

cumbersome bureaucratic processes impede the successful application of skilled individuals seeking to migrate to South Africa, and; South Africa lacks proactive programs and mechanisms for profiling, targeting, attracting and recruiting critical skills. In 2016 the DHA acknowledged that “South Africa has not yet put in place adequate policies, strategies, institutions and capacity for attracting, recruiting and retaining international migrants with the necessary skills and resources”¹⁴⁵.

Reliance on foreign skills may crowd-out local job seekers however not doing so comes at the risk of foregone opportunity. Incoming migrants create competition for local job seekers however they also bring with them expertise from foreign markets that can be utilised immediately and diffused locally. Business and government can reduce reliance on foreign talent by creating an attractive environment for local graduates, creating incentives for local graduates exploring foreign markets to return home and drawing expatriates back to South Africa. While countries such as Vietnam, India and China are actively seeking to recruit people from their diasporas, there seems to be no such activity in South Africa¹⁴⁶. Instead emphasis seems placed on creating barriers to exit.

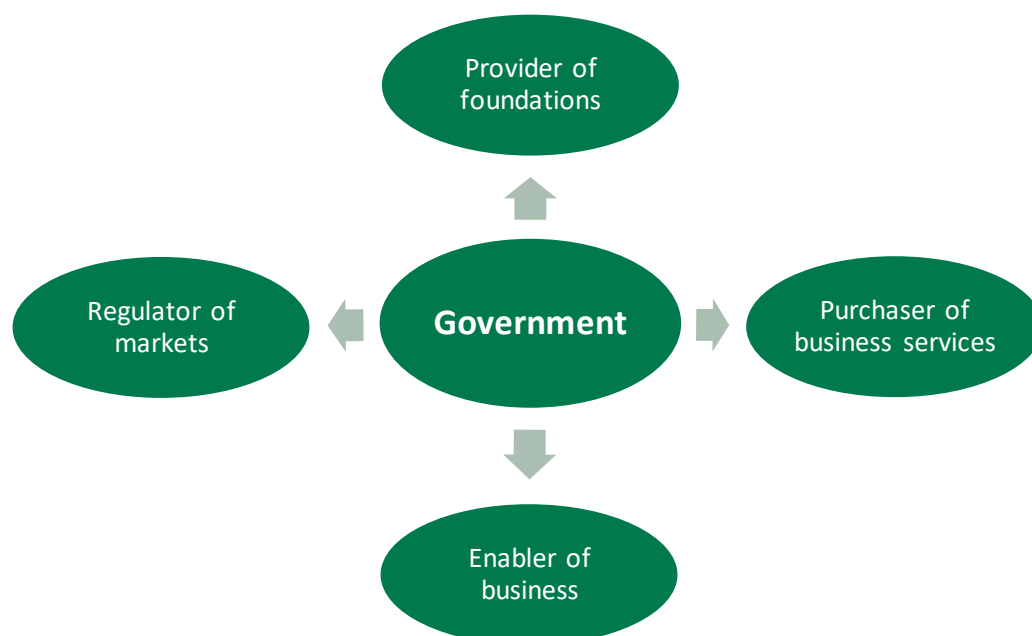
¹⁴⁵ Owusu-Sekyere *et.al.* (2016) A critical skills attraction index for South Africa, Human Sciences Research Council,

¹⁴⁶ Online Media (2018) – *Why SA Needs a More Migrant Friendly Policy While also luring back expats*, Biznews

Government Support



Government's ability to support the realisation of emerging economic opportunities is measured along five key roles the state plays. These roles cut across multiple levels of the state and are depicted below.



First, ***government as the provider of foundations*** assesses, government's ability to tax digital firms, the quality of guardianship of intellectual property and the enforcement of data regulation. The second role, ***government as a purchaser of business services***, assesses government's ability to drive business growth through the purchase of IT services. ***Government as an enabler*** is the third role which measures local government ability to enable local business and the quality and effectiveness of financial and non-financial incentives. The final measure, ***government as a regulator***, assesses labour regulation's ability to cater for emerging forms of work, the relevance and effectiveness of competition policy for the digital age and the responsiveness of sector specific regulation to emerging digital firms.

Government as the foundation of the digital economy

Intellectual Property Regulation



South Africa has historically been an effective guardian of intellectual property however the policy framework has been argued by some as fragmented and leading to low quality patents. Intellectual property is perceived by business to be well protected in South Africa, ranking far above global averages and BRICS comparators¹⁴⁷. Policy-makers have noted that temporary monopoly should only be granted when appropriate and when it does not reduce consumer welfare, and recognise that guardianship of the right to returns for innovation are foundational to the pursuit of a knowledge economy¹⁴⁸. South Africa's historical IP system was fragmented and reliant on a 'depository' IP system. The general sentiment in research conducted on the SA IP system seems to suggest that the depository system undermines genuine innovation as patents are granted when meeting thin formal requirements and only ever examined if challenged in litigation¹⁴⁹¹⁵⁰. This system provided market exclusivity regardless of patent quality to the detriment of consumers. The regulatory framework furthermore drastically favoured patentees to the expense of competitors and public interest by placing the onus for proving a patent is invalid on the party seeking to prove its invalidity¹⁵¹. Research by the IP Unit details that the depository system in conjunction with limited publicly-available data leave few avenues for assessing the quality of patents under this regime.

South Africa's IP policy framework is being revised to meet standards comparable with international benchmarks however expert capacity in regulators is required to prevent backlogs. Input from UNCTAD and the UN has seen Phase 1 of the Intellectual Property Policy of RSA completed, recommending transition to a substantive search and examination system¹⁵². This system uses expert examiners to judge whether evidence presented by patent applicants complies with a robust framework that justifies the grant of IP¹⁵³. A substantive system is used in innovative BRICS comparators such as China, India and Brazil.¹⁵⁴ Completing coverage of the policy across all industries is being complemented by support to CIPC in bolstering the expertise required of the reform – the SSE framework is expertise intensive¹⁵⁵. In the absence of adequate staff and slow turnaround, the motivation for local application may be depressed. Additionally, capacity to support applications or simplification of

¹⁴⁷ WEF (2017). Global Information Technology Report

¹⁴⁸ Online Media (2018) - *Phase 1 of South Africa's IP Policy – What you need to know* – Adams & Adams

¹⁴⁹ Intellectual Property Policy of the Republic of South Africa, 2018

¹⁵⁰ Online Media (2018) - *CIPC to Introduce Substantive Search and Examination* - DeRebus

¹⁵¹ IP Unit (2017). Innovation and Intellectual Property in South Africa: The Case for Reform

¹⁵² Online Media (2018) - *South Africa approves new IP Policy with Guidance from UN Agencies* – IP Unit UCT

¹⁵³ Online Media (2018) - *CIPC to Introduce Substantive Search and Examination* - DeRebus

¹⁵⁴ IP Unit (2017) Innovation and Intellectual Property in South Africa: The Case for Reform

¹⁵⁵ IP Unit (2017) Innovation and Intellectual Property in South Africa: The Case for Reform

processes may help reduce application costs – R15,000 to R30,000 may be spent on the filing costs of a legal practitioner.

Assessment of the condition relies on findings of expert researchers and analysis of the incentives and dynamics of IP systems to conclude likely impacts. Conclusions are in accordance with the IP Unit (UCT). Empirical measurement of IP policy effectiveness has been noted by the IP Unit as challenging given data availability.

Supplementary data and empirics:

- Access to records of patent applications to assess the relative ease/difficulty of obtaining a patent historically. These records should be made readily available moving forward to track future performance. This would be complemented by application and success rates for patenting South African inventions in other jurisdictions.

Data and Cyber-Security Regulation



South Africa's Cyber-Security regulatory framework is in the process of update though impending legislation prioritises punitive measures without enforcing preventative action. South Africa ranks 4th on the continent and 56th of 156 countries in the ITU cyber-security index¹⁵⁶. This index is a composite weighting of 25 measures and suggest South Africa fares strongly in terms of its cyber-criminal legislation and moderately in terms of its cyber-security legislation. The National Cybersecurity Policy Framework (NCPF) was approved by cabinet in 2012 and finally published in 2015. The NCPF indicates government recognition of the threat of cybersecurity and articulates government's overall strategic priorities and coordination objectives. This has led to the establishment of the National Cybersecurity Hub – a platform for interaction between government, civil society and industry – and the National Cyber-Security Advisory Council – advisors to government on cybersecurity policies. The Cyber-Crime's (CC) bill has been passed by the National Assembly and is soon to become law¹⁵⁷. The bill is a welcome refresher: cyber-crime has often been dealt under common law, and; the Electronic Communications and Transactions Act which initially restricted cyber-criminal offences is outdated¹⁵⁸¹⁵⁹.

The current bill prioritises punitive measures as it deals with offences, jurisdictional rights and authority of persecution locally and internationally. While the bill requires key infrastructure operators (as declared by the minister of finance such as financial institutions and communication service providers) report intrusions to SAPS within 72 hours, it neglects the second key guard against cyber-crime – prevention¹⁶⁰. The CC bill was originally conceptualised as the Cyber-Crimes and Cyber-security Bill however its current content does

¹⁵⁶ ITU (2018). Global Cyber-Security Index.

¹⁵⁷ Online Media (2018). *Cyber Crimes bill inches closer to becoming law* - ITWeb

¹⁵⁸ Online Media (2018). *Cyber Crimes bill inches closer to becoming law* - ITWeb

¹⁵⁹ This found the following offences criminal: hacking, denial of service attacks, phishing, infection with malware, possession or use of hardware/software; identity theft/fraud; electronic theft – Cyber-security laws and regulation – South Africa, ICLG

¹⁶⁰ Cliff, Dekker, Hofmeyr (2019) Technology & Sourcing Alert

not impose security obligations. Whether the bill will be appended to deepen its coverage or motivate business to proactively guard data is yet to be seen.

The yet to be enforced Protection of Personal Information (POPI) Act will position South Africa well for participation in global data flows, however compliance will be challenging for many businesses, readiness for compliance is unevenly spread and uncertainties of government effectiveness in enforcement have been raised. The final POPI Act was published in December 2018. The act requires entities that use and store an individual's personal information to act responsibly: consent for the use of individually identifiable data must be obtained; detail as to the use of this information must be provided, and; this data must be destroyed upon request and can only be held for a limited period of time. This legislation is crafted after the General Data Protection Regulation (GDPR) of the EU. The cross-border nature of data and the move to universal data laws is reflected in similarities between GDPR and POPI – locally sourced personal data can only be exported to/shared with nations and institutions compliant with acceptable legislation. POPI therefore brings South Africa to compliance with global benchmarks. This eases local business engagement with data drawn from Europe and other GDPR compliant markets¹⁶¹. However, flows of South African data to lower compliant regions and institutions will be deterred while local direct marketing will require consumer consent which may have disproportionate effects on SMMEs¹⁶².

There is a gap in enterprise readiness as many businesses require process and procedure overhauls, financing and expertise to capacitate and be able secure, source and extract data. This is despite Business having had visibility of the act for 6 years and having 1 year to comply following a yet to be announced commencement^{163, 164, 165}. A sample of business perceptions of POPI illustrates the recognition of the reputational need for compliance at 77%, 62% considering it a high priority, and a strong state of compliance readiness: 34% will definitely be prepared, 33% will likely be prepared, 10% are already compliant, 8% will probably not be ready and 3% will definitely not be ready.¹⁶⁶ The bulk of businesses consider compliance costly¹⁶⁷ while as at 2015, the bulk of SMMEs were non-complaint underpinning the need for training and support due to the bill's complexity¹⁶⁸. This gap is paralleled by uncertainty as to effective enforcement: the development of the bill was sluggish while effective enforcement requires the full capacitation of an information regulator.

Data and cyber-security assessments were conducted through interpretation of regulation, expert research and globally comparable indexes. Survey data detailing business readiness for POPIA is drawn from a small sample of businesses largely concentrated in the IT industry which may suggest overestimation of business readiness.

¹⁶¹ Luck (2014). POPI – is South Africa keeping up with international trends

¹⁶² Botha *et. Al.* (2015). The Effects of the POPI Act on Small and Medium Enterprises in South Africa

¹⁶³ Online Media (2019) - *POPI Commencement Date or POPI Effective Date Starts the Clock* – Michalsons

¹⁶⁴ Online Media (2019) - *Only 34% of South African Organisations Ready to Comply with POPI Act* – ITWeb

¹⁶⁵ Kandeh *et. Al.* (2018). Enforcement of the Protection of Personal Information Act: Perspective of Data Management Professionals

¹⁶⁶ Online Media (2019) - *Only 34% of South African Organisations Ready to Comply with POPI Act* – ITWeb

¹⁶⁷ Kandeh *et. Al.* (2018) Enforcement of the Protection of Personal Information Act: Perspective of Data Management Professionals

¹⁶⁸ Botha *et. Al.* (2015). The Effects of the POPI Act on Small and Medium Enterprises in South Africa



The effectiveness and integrity of the South African Revenue Service (SARS) has been called to question creating uncertainty around its ability to manage local and international tax matters. SARS has come under public pressure given a spate of poor performance and allegations of corruption. These accusations have created concern around the entity's ability to support the fiscus. Although SARS has consistently failed to meet its collection targets for a number of years, this is a debatable measure of performance as macro-economic conditions, inaccurate target-setting and tax-payer apathy may be the cause. Evidence of the entity's woes are better measured in terms of institutional dynamics and on-goings which may in turn impact performance. Firstly, SARS capacity may have been eroded through the loss of expertise and the closure of various investigative divisions¹⁶⁹. Secondly, the entity was poorly managed under former SARS commissioner Tom Moyane who had little experience. This may have contributed to the former source of failure. Secondly, SARS has been noted as focusing on 'soft-targets' by focusing audit efforts towards registered and voluntarily paying individuals and businesses as opposed to seeking out unregistered and tax avoiding entities¹⁷⁰. Potentially a function of the lack of expertise. The Cabinet and President Ramaphosa have given these shortfalls due regard and are intervening which suggests the possibility of future improvement.

The operating and ownership models of digital firms providing cross-border services create challenges for tax legislation and taxing entities. Firms such as Uber have developed innovative ways to avoid tax by attributing all revenues to a host of subsidiaries domiciled in low tax or no tax jurisdictions¹⁷¹¹⁷².

For example, no fares for South African Ubers touch the local Uber subsidiaries as they are transferred directly to Uber's Dutch subsidiary. Drivers receive payment directly from another Dutch subsidiary. This leaves the local Uber subsidiary with limited taxable revenues.

The Uber model of mitigating taxes

Uber was established in San Francisco. As the firm began to scale, it created a subsidiary in the Netherlands – Uber C.V. Uber C.V. has contracted with Uber to use its Intellectual Property for a royalty fee on revenues and share the costs and benefits of the IP moving forward. Uber subsequently established Uber B.V., also in the Netherlands. All passenger fares outside of the US are paid to Uber B.V. with payment for the driver sent back by yet another Dutch Uber subsidiary. Local Uber subsidiaries provide support services, do not create revenues and therefore leave tax authorities with little means of taxation.

SARS has introduced a 'Digital Tax' to close the gap on untaxed revenues of digital firms. Alongside many other jurisdictions, South Africa introduced a 'Digital Tax' which took effect

¹⁶⁹ Online Media (2018). – *Saving SARS: Why SARS is Failing and What Can be Done to get it Back on Track* -Bowmans

¹⁷⁰ Online Media (2018). – *Saving SARS: Why SARS is Failing and What Can be Done to get it Back on Track* -Bowmans.

¹⁷¹ Online Media (2015). – *How Uber Plays the Tax Shell Game* – Fortune

¹⁷² Online Media (2019). – *New VAT rules lead global tax reform* -Mail & Guardian

in April 2019. Multi-nationals providing e-services in South Africa with operations domiciled overseas are required to register with SARS and pay 15% of revenues in VAT. Since its introduction 5 years ago, companies subject to the tax have been broadened to include entities such as Google, Facebook, Uber and AirBnB¹⁷³. These firms may choose to recover these costs through increased pricing. Transportation in South Africa is exempt from VAT however the fees that Uber's subsidiary is charged to run the service will attract VAT. SARS has seen healthy registration activity and expects the tax will be widely successful as digital platforms and companies were involved and provided input into the process¹⁷⁴. The tax strategy is aligned with the OECD VAT guidelines which forms part of the base erosion and profit shifting (BEPS) initiative. South Africa is part of this initiative which aims to develop a response to the avoidance of taxes of digital firms and highlights the need for the global community to re-examine taxation fundamentals.¹⁷⁵¹⁷⁶ Foreign digital firms operating in South Africa are not subject to any form of corporate tax. The Davis Tax Committee has advised South Africa following the lead of regulation developed in the OECD in this regard¹⁷⁷.

Taxation of robots that substitute human labour has been suggested as a way to offset the negative effects of automation however this remains a debated topic that has drawn little attention locally. Businesses automating processes to substitute for human labour would effectively reduce their tax burden and avoid contributions to social security mechanisms. This is of particular concern in labour intensive, developing markets. The EU investigated and eventually voted against a 'robot tax' while South Korea has excluded key tax incentives for investments made in automation¹⁷⁸. In South Africa, the topic has yet to spark public debate

Given the susceptibility of the tax base to economic conditions, alternative KPIs are necessary to measure effectiveness. These indicators are drawn from a recognised legal firm. Evaluation of readiness to tax digital firms overlays current policy changes with global trends and best practices.

Government as a purchaser of business services



The South African government aspires to the efficient and effective digitisation of services and operations. Digitisation of government can improve the implementation and enforcement of policy and the quality, transparency and effectiveness of service delivery. There are instances of successful e-government at the local level and national levels with SARS, DHA Smart Identification Cards, NATIS, DoH National Health Normative Health Standards Framework, SITA, and eHome Affairs. South Africa is considered a regional leader

¹⁷³ Online Media (2019). – *New VAT rules lead global tax reform* -Mail & Guardian

¹⁷⁴ Online Media (2019). – *New VAT rules lead global tax reform* -Mail & Guardian

¹⁷⁵ Online Media (2019). – *New VAT rules lead global tax reform* -Mail & Guardian

¹⁷⁶ Online Media (NY)– *Tech Giants Tax Avoidance hurts South Africa's Media* – Tax Consulting

¹⁷⁷ Online Media (NY)– *Tech Giants Tax Avoidance hurts South Africa's Media* – Tax Consulting

¹⁷⁸ Online Media (2018). – *Taxing Robots is a Bad Idea* – ITWeb

in e-Government development and falls slightly short of the continental leader of Mauritius in the UN e-Government Development Index¹⁷⁹.

Approximately 17% of national GDP is spent on procurement with a large share of this spend allocated to ICT. The R500 to R800 billion government procurement bill is generous relative to benchmarks at 4% higher than 2015 OECD averages and 10% higher than Mexico¹⁸⁰. The bulk of government purchases of goods and services is driven by provincial government, followed by national government and finally municipalities.¹⁸¹¹⁸² During 2016, approximately ZAR 14 billion was spent on ICT in the form of computer services, communication and software.¹⁸³ Despite the scale of this spend, there remain structural weaknesses in quality and effectiveness of government's digital infrastructure.¹⁸⁴

The effectiveness of this spend is offset by leakages and potential corruption. Unfortunately the effectiveness of this spend is imperfect with Treasury Chief Willie Mathebula's statement at the State of Capture Inquiry: nearly 50% of government procurement does not follow proper regulatory processes and is at risk of loss to corruption.¹⁸⁵ This is nearly half of the target value to be raised by SARS in the 2017/18 financial year¹⁸⁶. Furthermore, South Africa scores poorly relative to comparator countries on the Global Innovation Policy Index measure of government procurement. South Africa scores particularly poorly on indicators of corruption.¹⁸⁷ Government departments can develop procurement processes as long as they are compliant with the national regulatory framework however this offers avenues for unethical practice.¹⁸⁸ Leakage in state spending is driven by poor accountability, political interference, lack of expertise in service providers and bid committees, and non-compliance with the regulatory framework¹⁸⁹.

Government have deployed a host of digital platforms to improve procurement process transparency and improve business access to opportunity however fragmentation of the supply chain management system persists. There are 36 supply chain management systems in government which are poorly integrated and poorly automated. The complexity of this system, its outdated nature, and the way internal controls are not adhered to have contributed to process non-compliance. E-procurement platforms are a means for improving efficiency and transparency by providing a single point of interaction and improving bidder visibility of the bidder process.¹⁹⁰ The government launched an e-tender application portal and centralised database where tenders from all spheres of government are published.¹⁹¹ This in conjunction with the integrated financial management system (IFMS) would reduce space for unethical practice and fraud. The IFMS – a unified financial management suite envisioned

¹⁷⁹ UN (2018) e-Government Development Index

¹⁸⁰ OurWorld in Data (2019)

¹⁸¹ StatsSA (2017). Financial Statistics of Consolidated Government

¹⁸² Online Media (2017) - *If government pays on time, SMMEs will engage in droves* - IOL

¹⁸³ TechCentral (2016) – *Where government ICT spending goes* – Online Media – TechCentral

¹⁸⁴ TechCentral (2016) – *Where government ICT spending goes* – Online Media – TechCentral

¹⁸⁵ Online Media (2018) - *R400bn lost to flawed tenders* – Press Reader

¹⁸⁶ Online Media (2018) - *R400bn lost to flawed tenders* – Press Reader

¹⁸⁷ ITIF (2013). Global Innovation Policy Index

¹⁸⁸ Mazibuko (2018). Analysis of the Administration of Procurement Practices in the South African Public Sector

¹⁸⁹ Mazibuko (2018). Analysis of the Administration of Procurement Practices in the South African Public Sector

¹⁹⁰ Anthony (2018). The Use of E-procurement in South African Public Procurement Law: Challenges and Prospects

¹⁹¹ Anthony (2018). The Use of E-procurement in South African Public Procurement Law: Challenges and Prospects

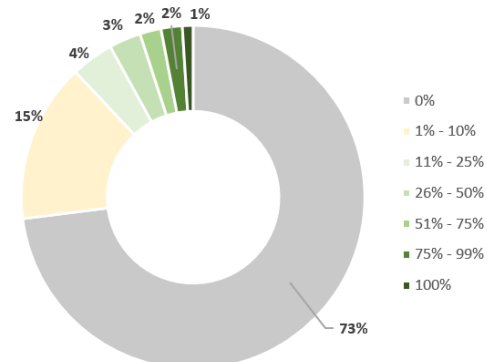
to replace the disparate supply chain systems that interfaces with SARS and CIPC – was originally envisioned in 2005 though is yet to be implemented. A single architecture able to monitor and track public transactions would improve effectiveness and transparency of distribution of government opportunity. Government expertise and leadership continuity have created challenges for the deployment of the IFMS and motivated a forensic investigation into the project which has found significant instances of financial mismanagement and unauthorised expenditure^{192,193}

A host of SMMEs are thriving on government contracts though poor procurement process and repayment timelines deter the majority of SMMEs.

Approximately 25% of surveyed SMMEs do business with government. A handful of these firms have emerged solely due to government opportunity or have effectively positioned themselves for maximal extraction of opportunity from government contracts. Targeted procurement strategies have evidenced that they can improve SMME participation and deepen linkages between historically empowered and historically disadvantaged firms.¹⁹⁴

However, poor performance in government process underpins a backlog in government-led development of SMMEs.¹⁹⁵ The bulk of SMMEs not engaging with government in business do so due to slow, onerous and obscure tender processes and long payment terms. Emerging enterprises have limited financial depth to endure slow payment which in the case of government averages over 80 days – nearly twice as long as payment leads for the private sector regardless of regulation that enforces claims be paid within 30 days of invoice.^{196,197,198}

Share of Government Revenue in SMME Business Turnover



Source: SAICA, 2016, SMME Insight Report

Government as an enabler

Financial and non-financial incentives



The South African government has a comprehensive though uncoordinated range of business incentives. These incentives promote skills development, drive innovation and

¹⁹²Online Media (2019). - *Integrated financial management system perfect vehicle to fix state shortcomings* – Business Day

¹⁹³Online Media (2018). - *5 Reasons Treasury's R1bn new financial management system didn't take off* – Fin24

¹⁹⁴Abdulrauf et. Al. (2016). Evaluating the impact of public sector targeted procurement strategies on the development of SMEs in the construction industry,

¹⁹⁵Mazibuko (2018). Analysis of the Administration of Procurement Practices in the South African Public Sector

¹⁹⁶SAICA, (2016). SMME Insights Report, SAICA.

¹⁹⁷Online Media (2017) - *If government pays on time, SMMEs will engage in droves* - IOL

¹⁹⁸Online Media (2017) - *If government pays on time, SMMEs will engage in droves* - IOL

investment, attract foreign business and assist in redistribution. The South African government has an estimated 244 business incentives in the form of direct and indirect grants and subsidies which equated 3% of national budget in 2019¹⁹⁹. These incentives are considered competitive, attractive and well aligned with national objectives.^{200,201} Despite this, there is concern that these programmes are inadequately coordinated and less effective than comparator countries, that they tend to prioritise established business as opposed to emerging business and do not systemically complement each-other²⁰². In addition there is a lack of business awareness of incentives, underperformance in approval and application processes, and a lack of evidence led design.²⁰³ Subsequently these incentives – while impactful – have collectively not realised the scale of outcomes intended²⁰⁴. Government has proposed the establishment of an Inter-Government Incentives Coordinating Committee and identified inadequacy in tracking the impact of these programs. The following assesses the effectiveness of 4 representative incentives: broad-based black economic empowerment (BBBEE), 11D R&D tax incentives, 12J venture capital tax incentives and the Foreign Investment Grant (FIG). Export promoting incentives are discussed in the Constructing Ecosystems pillar while incentives for business investment in employee skills development is discussed in the Human Capital pillar.

BBBEE seeks to redress apartheid induced inequalities by incentivising business to have racially representative ownership and equitable supply chain management policies. The legislation requires businesses with turnover above ZAR 10 million to obtain a BBBEE scorecard. This scorecard measures a business in terms of racial composition of ownership and management control, business commitment to skills and supply chain development, and contribution to socio-economic objectives. Government is expanding the programme to award points to businesses which employ previously unemployed, previously disadvantaged youth. The policy seeks to achieve redress for racial inequalities by impacting business access to government contracts. The Preferential Procurement Policy Framework Act (PPPFA), was revised to bring alignment with the Broad-Based Black Economic Empowerment Act. The framework reserves 10% to 20% of a bid score for preferred non-financial criteria. The legislation therefore assists in achieving broader policy objectives - awarding contracts to preferred providers based on non-financial criteria can create employment in key areas and assist in re-distribution. While it is challenging to quantify the social effect of the policy, anecdotal evidence reveals that there are significantly more previously disadvantaged business owners. The policy has been criticised for potentially creating a new elite as opposed to achieving broader economic transformation.

The FIG offsets the costs foreign firms face in establishing operations in South Africa. This applies to qualifying manufacturing businesses which have been approved in the Manufacturing Investment Programme. The incentive offers a cash grant which is the lesser of 15% of the value of new capital and equipment or the total relocation costs incurred by

¹⁹⁹ Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

²⁰⁰ Barbour (2005). An Assessment of South Africa's Investment Incentive Regime with a Focus on the Manufacturing Sector

²⁰¹ Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

²⁰² Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

²⁰³ Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

²⁰⁴ Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

moving capital and equipment to a maximum of ZAR 10 million. The 12I incentive - which directs investment into manufacturing and resulted in a 50% lift in manufacturing output – also offers financial support to local manufacturing firms.²⁰⁵

South Africa's key innovation tax deductions are competitive relative to global leaders and BRICS nations. The Section 11D R&D tax incentive allows a maximum of 150% tax deduction on expenditure on research on an invention, or on new or improved product designs and functionalities and allows for accelerated depreciation of capital expenditure. This is a competitive policy when benchmarked to innovation leaders: Israel allows qualifying large enterprises a corporate tax rate of 5-8% and between 7.5% and 16% for SMEs; the US gives a non-refundable tax credit to reduce income tax up to 9.1%. Benchmarked to more comparable BRICS states finds tax policies are also relatively competitive - Brazil offers a 200% incentive, China offers a 75% maximum deduction, Russia, offers 150%, while India allows only 15%.²⁰⁶

The 11D tax incentive has had a positive impact on investment in R&D however it is inefficiently administered. Between its introduction in 2006 and June 2017 292 companies have received approval for the tax deduction. The government is estimated to have spent R36.1 billion on R&D through the incentive. Data from 2012 shows that 75% of companies whose application was approved attributed the creation of new products to the tax incentive²⁰⁷. A further 42% of companies attributed an increased scale and pace of pre-planned R&D to the scheme. This resulted in a net 2.9% increase in R&D expenditure.²⁰⁸ The 2015 National Treasury budget review found severe backlogs in the process of approving applications attributed to capacity constraints in the DST.²⁰⁹ This is reflected in decreasing applications being adjudicated – 218 adjudications in 2012 steadily declined to 97 in 2014.²¹⁰ These imperfections have been identified as the cause of a 70% drop in forgone government revenue from approved tax deductions in 2013.²¹¹ Progress in achieving efficiency seems to have been made²¹² As of November 2018 potential structural reforms to improve administrative efficiency were being considered, but no reforms have been implemented.²¹³

Section 12J venture capital funds are funnelling investment towards employment creating SMMEs and growing rapidly in popularity. The 12J tax incentive allows individuals, corporates and funds investing in qualifying venture capital companies (VCCs) to offset their income tax burden by 45% of the investment. The incentive seeks to drive SMME growth in key sectors that offer high employment growth opportunity.²¹⁴ In 2015 an estimated 30 funds were registered for the 12J incentive. This accelerated to over 100 in 2018 illustrating the attractiveness of the fund and its recent recognition among investors leading to an estimated

²⁰⁵ A study of the section 12J VCC regime as a capital procurement instrument for SMMEs, Ngwenya, 2014

²⁰⁶ Deloitte (2018). Survey of Global Investment and Innovation Incentives

²⁰⁷ National Advisory Council on Innovation (2015) Review of The White Paper on Science and Technology

²⁰⁸ National Advisory Council on Innovation (2015) Review of The White Paper on Science and Technology

²⁰⁹ Deloitte (2018). Survey of Global Investment and Innovation Incentives

²¹⁰ Status update on processing of application for the R&D tax incentive – Presentation to the Standing Committee on Finance (SCOF).

²¹¹ DST (2016). Science and Technology on Research and Development Tax Incentive report, Polity - Issued by Department of Science and Technology

²¹² Parliamentary Monitoring Group (2017). Research and Development (R&D) Tax Incentives; Indigenous Knowledge Systems Bill: briefing

²¹³ Deloitte (2018). Survey of Global Investment and Innovation Incentives

²¹⁴ This excludes SMMEs operating in the following: trade of immovable property, financial services, advisory services, gambling and casinos, manufacturing of liquor, tobacco or firearms, and trade carried out outside of South Africa

R3.6 billion under management.²¹⁵²¹⁶ National Treasury's forthcoming review of the fund will determine whether the economic benefits outweigh foregone tax revenues and understand the degree to which funding is diversified.²¹⁷ This comes amidst concerns of excessive use ('abuse') of the fund by individual investors and the potential for distorting investment decisions to the detriment of investment quality.²¹⁸

Local government engagement with business



There are large variances in local government ability to support business. An IUDF assessment concludes that businesses face highly variant levels of regulatory efficiency and many firms face excessive red tape.²¹⁹ The World Bank Doing Business in South Africa report uses several indexes to rank the performance of South African cities in enabling business operation. A key metric is the ease of getting electricity which would be vital for all digital businesses. Cities performed with a high degree of variance, supporting IUDF findings that there is little consistency between local governments and indicating that a small minority of cities perform slightly above average on this criterion. The report finds that the greater degree of local autonomy in business regulation, the greater the variance in performance.²²⁰ The disparities in city-level scores of the Doing Business report would hold true for national measures such as the time taken and number of procedures required for starting a business. South Africa fares moderately on these scores.²²¹ The doing business report notes that improvements in this measure are largely driven by efficiencies from the digitisation of applications and processes.

Local governments have not fostered a good business government relationship. A proper framework for cooperation and working relationship will allow local governments to be more agile and effective at responding to the needs of digitally-enabled business. An IUDF assessment observed that many municipalities do not meaningfully engage with local business or other economic stakeholders.²²² Moreover, in some instances municipalities have an actively adversarial relationships with business as they do not pay suppliers on time or at all. Many of these are SMEs. Both local and national government are taking steps to facilitate better cooperation. The Citi Support Program (CSP) was formulated in consultation with the World Bank and with recognized industry experts embedded in business. The impact of these

²¹⁵ Online Media: *Section 12J incentive good start but government can do more* – Venture Burn

²¹⁶ SAVCA (2018). Venture Capital Industry Survey

²¹⁷ Online Media (2019). - *Venture Capital Company tax regime under review. Again* - Moneyweb

²¹⁸ Ngwenya (2014). A study of the section 12J VCC regime as a capital procurement instrument for SMMEs

²¹⁹ Department of Cooperative Governance and Traditional Affairs (2016). Integrated Urban Development Framework.

²²⁰ World Bank (2018). Doing Business in South Africa 2018

²²¹ The South African business environment can be challenging and regulatory compliance costly – more than half of surveyed SMEs consider the regulatory environment restrictive and a key inhibitor to growth resulting in nearly 4% of turnover being spent on compliance. Government recognised the challenges businesses face and proposed a Red Tape Impact Assessment Bill. The Bill sought to provide for the assessment of regulatory measures developed by executive, legislatures and self-regulatory bodies to identify and reduce red tape for businesses. It further sought to provide for the establishment of Red Tape Impact Assessment (RIA) Units.

²²² Department of Cooperative Governance and Traditional Affairs (2016). Integrated Urban Development Framework.

steps is uncertain given that CSP is in its initial phases however there is confidence of its likely effects and growing interest from the presidency.

Government as a regulator

Sector-specific regulation



The National Land Transport Amendment Bill places the job security of drivers of e-hailing at risk by introducing more stringent requirements for operation. The amendment bill details a number of interventions in transport sector regulation. These amendments aim to bring the act into alignment with the objectives equitable and reliable access to transport detailed in the White Paper on the National Transport Policy (2017)²²³. The proposed amendments will now include e-hailing platforms and require all e-hailing drivers obtain an operating license. Drivers without a license will be barred from their application, while operating without licenses could incur hefty fines for e-hailing companies and drivers and potential imprisonment for drivers.²²⁴ While seeking to bring e-hailing platforms into compliance with regulatory standards, implementation will be challenging - drivers currently seeking to obtain permits from local authorities are often unable to do so with backlogs extending as far as 18 months. In addition, temporary licenses are not provided during the application process²²⁵. In response, Uber has proposed that implementation of and sanctions relating to the amendment be halted until local municipalities have capacity and processes in place to supply these permits efficiently.²²⁶ In the absence of this, the bulk of drivers will be restricted from operation. An additional clause would furthermore require all e-hailing vehicles be marked appropriately – of concern given the incumbent taxi industry’s history of intimidation and violence towards Uber and e-hailing platform drivers.²²⁷

The Tourism Amendment Bill will extend regulation to Airbnb by including short term home rentals under the Tourism Act. This decision follows lobbying by the Federated Hospitality Association of South Africa (Fedhasa) and the Tourism Business Council of South Africa (TBCSA). These entities presented a case for equal regulation for Airbnb users by arguing that Airbnb is a legitimate competitive threat to traditional hotel providers, that they have a cost advantage by falling outside of regulatory requirements and that if the platform is left unregulated it could lead to job losses^{228,229}. The bill furthermore seeks to provide security to consumers and local communities. The amendment bill empowers the Minister of Tourism to

²²³ Appasamy. (2018) – *National Land Transport Amendment Bill process aims to revamp public transport* – Online Media – Mail & Guardian

²²⁴ ANA. (2018) – *Uber against proposed changes to transport law* – Online Media – The Citizen

²²⁵ Uber Online

²²⁶ ANA. (2018) – *Uber against proposed changes to transport law* – Online Media – The Citizen

²²⁷ ANA. (2018) – *Uber against proposed changes to transport law* – Online Media – The Citizen

²²⁸ Crous. (2019) – *Thresholds to be put in place, limiting amounts of bookable days in South African Airbnbs*

²²⁹ Charles (2019) – *Airbnb faces tighter regulations in SA* – Online Media - IOL

establish regulatory requirements for platform participants. This might subject homeowners renting their property on platforms to inspections and audits and require they have appropriate licenses, insurance and certificates necessary for operation²³⁰. This may furthermore include limits on the number of nights a guest may stay and what business hours they may operate, how much a home-owner may earn and what zones home-owners may operate in.²³¹²³² The Minister of Tourism has stated that the objective is not to overregulate, but to create minimum standards and regulatory consistency across municipalities.²³³ The proposed amendment may however reduce the number of home-owners who might be willing and able to use Airbnb as ease of use is reduced and barriers to access introduced. In addition, there is the potential for rising prices as costs are passed onto the consumer. Subsequently, the Minister of Economic Opportunities and the Western Cape government have voiced concern over the content of the bill while some academic observers have suggested it anti-competitive.²³⁴²³⁵

Emerging financial technology providers are subject to stringent regulation however regulatory bodies are investigating potential alternatives. South Africa is recognised for a world class financial services sector. This is underpinned by sophisticated and comprehensive regulation which is overseen by effective regulatory bodies. ‘Fintechs’ are often agile firms that emerge independently of incumbent financial services players. These businesses use technology in innovative and disruptive ways to reduce the cost of and expand access to financial services. The South African Reserve Bank (SARB) and associated regulators have adopted a cautious approach to regulating these firms through engagement with industry and the establishment of a FinTech programme resourced with full-time staff. The programme – which runs parallel to the Inter-Governmental Fintech Working Group, National Treasury and a potential regulatory sandbox for experimentation – assesses the implications of Fintechs on the stability of the sector and consumer wellbeing to develop appropriate regulatory and policy responses²³⁶. While markets such as the UK, Australia and Kenya have developed bespoke regulation for various fintech delivered products, these are uncommon in South Africa. Subsequently, innovation is rife in permissible areas such as payments. However, the stringency of foundational regulation such as the Banking Act and the National Credit Act in combination with the lack of bespoke regulation has seen limited activity in products such as peer-to-peer lending, mobile money and non-donation crowd-funding. Regulation relating to these products either prohibits them outright or creates demands for compliance that emerging businesses are unable to meet. Fintechs therefore face regulatory certainty if their products are similar to those governed by existing regulation but face significant barriers should their products fall outside of what is common²³⁷.

²³⁰ Charles (2018) – *Hospitality industry pushes to have Airbnb regulated* – Online Media - IOL

²³¹ Vegter, (2019) – *Hotel industry captures the state and targets competitors* – Online Media – Daily Maverick

²³² Charles (2019) – *Airbnb faces tighter regulations in SA* – Online Media - IOL

²³³ Crous. (2019) – *Thresholds to be put in place, limiting amounts of bookable days in South African Airbnbs* – Online Media – Traveller24

²³⁴ 702 (2019) – *Airbnb regulations are anti-competitive* – TUT lecturer – Online Media – 702

²³⁶ Da Silva (2019). South Africa Lays Groundwork for FinTech Regulation

²³⁷ AlphaCode (2019) – *Navigating Regulation to Achieve Innovation* – Online Media – AlphaCode

Labour regulation in the digital age



Labour market regulators face the challenge of regulating emerging forms of labour and protecting workers in a large informal sector. South African labour regulation is dynamic and evolves to cater for emerging needs. However, enforcement is poor due to a lack of resources while gig economy workers remain excluded from protection.

The informal labour market and frictions in the formal labour market pose challenges for labour regulators. Circumstances of poverty, inequality and unemployment are reflected in the existence of the informal economy and actions of organised labour. Approximately 34% of the employed in South Africa work in the informal sector and operate primarily in trade and services.²³⁸²³⁹ The informal market poses challenges for regulation due to its amorphous structure and lack of visibility. Despite national policy recognition of the informal sector's role in employment, local government can be neglectful and at times hostile: street vendors goods are often confiscated, business owners are subject to disruptive zoning requirements and recyclers are denied access to waste.^{240 241} The bulk of these workers suffer from poor conditions and poor pay relative to effort. While the formal sector offers superior pay, for many workers this remains inadequate. More than half of strike actions in 2017 were principally motivated by disputes in earnings.²⁴² The majority of these 132 strikes were protected and had followed necessary regulatory procedures – protected strike action is permitted by the Labour Regulations Act for formally defined employees.²⁴³²⁴⁴ This right therefore does not extend to contract workers.

South African labour law prevents the exploitation of workers, is adaptive and continues to expand coverage to a variety of forms of labour. The labour regulatory framework is considered on par with many developed nations as it provides minimum condition of work, leave and compensation, it enforces contractual security for employees, and it enforces social security expectations²⁴⁵. South Africa's regulatory framework is not static with a host of developments illustrating its potential to adapt to emerging conditions and reflect the needs of a wide range of labour. Key to these are the intended implementation of R204²⁴⁶ and the National Minimum Wage Act (NMWA). The R204 seeks to expand the provision of labour rights and protection to all workers in the informal economy and reflects government commitment to catering for the needs of labour not traditionally defined as employees.²⁴⁷

²³⁸ Fedusa, (2018) Informal Economy Panel

²³⁹ Ethekwini Municipality (2018). Economic Development and Growth in Ethekwini- Issue 17

²⁴⁰ Skinner & Rogan (2019). *The informal Economy: Is Policy Based on Correct Assumption?* – Econ3x3

²⁴¹ Skinner & Rogan (2019). *The informal Economy: Is Policy Based on Correct Assumption?* – Econ3x3

²⁴² Department of Labour (2017). Industrial Action Report

²⁴³ Chayya (2018). Towards the creation a fair ride-hailing industry: Should South African labour law regulate the Uber relationship?

²⁴⁴ Online Media (2018) - SA sets a new record for Industrial Action – Business Day

²⁴⁵ Online Media (2015) - How South Africa's Labour Law Compares Globally - APSO

²⁴⁶ International Labour Organisation (2019). Online

²⁴⁷ Department of Labour (2018). Department of Labour in Partnership with NEDLAC and strategic partners to convene national dialogue on "Transition from the Informal to the Formal Economy"

The nature of expanding labour regulation coverage is reflected in the historical enforcement of the Labour Relations Amendment Act 6 of 2014 which provided enhanced protection for workers in temporary employment and protection against unfair dismissal²⁴⁸. The yet to be enforced NMWA applies to all workers and their employers. ‘Worker’ as a broader definition than ‘employee’ includes contract workers.²⁴⁹ The NMWA legislates that workers shall receive a minimum of R20 per hour except for domestic, agricultural and government expanded works programs as they have their own minimum wage levels.²⁵⁰²⁵¹

Despite a progressive attitude to regulation, its benefits are detracted from by imperfect compliance due to a lack of capacity in monitoring and enforcement. Analysis conducted in 2007 suggested that 45% of workers were paid below sectoral minimum wages with an average wage gap of 16%.²⁵² Lack of resources for enforcement underpin low compliance. For example: as of 2016, South Africa had on average 10 labour inspectors per 100,000 employees; only 5% of 30,000 households targeted for inspection were inspected for compliance with domestic minimum wages in 2003.²⁵³ This is compounded by a lack of worker awareness of labour regulation. Digital platforms’ digital visibility and traceable flows of client, worker and payment information may offer some innovative avenues for monitoring.

South African labour legislation is yet to define its stance on gig-economy workers. Workers drawing income from platforms such as Uber are not considered employees of the platform. As such they fall into the regulatory space of self-employed and lack entitlement to the host of provisions for employees such as minimum conditions of work and social protection. The Labour Court’s overturn of the CCMA ruling in favour of defining Uber drivers as employees of Uber that illustrates the complexities associated with testing employee-employer relationships. This is true across a host of markets however the payment of a wage is widely recognised as evidence of employment.²⁵⁴ South African labour law has been argued to prioritise focus on traditionally employed labour to the detriment of gig-economy workers that nonetheless are dependent on the platform for access to work opportunities.²⁵⁵ This state of worker dependency and platform control creates vulnerabilities for platform workers – anonymous reports from drivers transport platforms detail the threat of disabling driver access to the platform if involved in the formation of a union and the pressures placed on drivers against trip cancellation regardless of driver safety²⁵⁶.

Local studies, schemes and academic literature illustrate the motivation to solve for uncertainties around regulation of gig-economy workers and platforms. The Fairwork scheme is housed at Oxford with its collaboration with UCT and UWC an indicator of progress outside of the public sector. The scheme is using South Africa as a case-study to test how

²⁴⁸ Chayya (2018). Towards the creation a fair ride-hailing industry: Should South African labour law regulate the Uber relationship?

²⁴⁹ Online Media (2018) - Q&A: *Between the lines of a national minimum wage with Neil Coleman* – the Daily Maverick

²⁵⁰ Online Media (2019) - *Everything you need to know about the minimum wage act* – The South African

²⁵¹ The Presidency (2018). National Minimum Wage Bill

²⁵² Murahwa (2016). Monitoring and enforcement: strategies to ensure an effective national minimum wage in South Africa

²⁵³ Murahwa (2016). Monitoring and enforcement: strategies to ensure an effective national minimum wage in South Africa

²⁵⁴ Oxford, UCT (2017). The employment status of uber drivers

²⁵⁵ Chayya (2018). Towards the creation a fair ride-hailing industry: Should South African labour law regulate the Uber relationship?

²⁵⁶ Online Media (2019). *Uber, Taxify score poorly in Oxford University study on South African digital platform working conditions* – The Daily Maverick

principles around gig-economy labour regulation can be integrated with labour law.²⁵⁷ Fairwork recognise that platforms reliant on local market demand can be directed to comply with labour regulation. Platforms that contract labour through non-regionally bound digital channels are more challenging to regulate. In this regard the Fairwork scheme promotes the establishment of an international accreditation of platforms based on key principles.²⁵⁸ This may be integrated with local regulation and motivate self-regulation among platforms. Application of a set of these principles in South Africa - fair pay, employment conditions, employment contracts, management, and labour representation – found poor performance across the majority of popular South African platforms.²⁵⁹ However, there is evidence that platform management is forward-looking and may respond to these findings – Bottles, a liquor delivery service, has committed to allowing workers establish collective representation.

Labour market composition is available annually and is robust. Labour union effectiveness however requires deeper research to unpack its economic impact while enforcement data tends to be dated. Assessing labour regulation dynamism relies on interpretation of case law while pressure to cater for non-traditional forms of labour is proxied for by rising intensity in public debate and academic research.

Supplementary data and empirics:

- Annual publication of department of labour inspector staffing and inspection activity at a sub-national level. This may furthermore detail actions taken.

Competition Policy in the Digital Age



Competition policies around the world may require revision and rigorous enforcement to cater for the exponential and disruptive nature of digital businesses. Disruptive innovators can have drastic impacts on the distribution of market power in a very short period and lead to the entrenchment of dominant digital firms²⁶⁰. Three characteristics of the digital provide incumbent digital firms with competitive advantages that make them difficult to dislodge and create incentives for anti-competitive behaviour²⁶¹. Firstly, there are extreme returns to scale with drastically falling costs relative to customers served. Secondly, network externalities entrench incumbent firms and create significant barriers to emerging competitors. Thirdly, data plays a key role as both an input and output. OECD²⁶² research details the need to make changes to the standard and burden of proof in enforcement due to the high costs of under-enforcement. A bias to over-enforcement is advised – actions of dominant firms to reduce the competitive pressures they face should be forbidden in the absence of clear consumer

²⁵⁷ UCT Online News (2018). Project to protect workers in digital gig economy

²⁵⁸ UCT Online News (2018). Project to protect workers in digital gig economy

²⁵⁹ Online Media (2019). *Uber, Taxify score poorly in Oxford University study on South African digital platform working conditions* – The Daily Maverick

²⁶⁰ Ndlovu, UBER vs. METERED TAXIS: A COMPETITION ISSUE OR A REGULATORY NIGHTMARE, 2017

²⁶¹ OECD, Competition Policy for the Digital Age, 2019

²⁶² *Ibid.*

welfare gains even if consumer harm is difficult to clearly measure; in highly concentrated markets with high barriers to entry it may be necessary to require incumbent firms prove their actions pro-competitive.

Competition commissions need to play an increasingly active role in the oversight of markets. Given the dynamism of digital firms, the uncertain impacts they may have on competition and consumer welfare and range of markets they can impact, it is increasingly necessary for competition commissions to conduct inquiries into markets in which these firms operate on a case by case basis²⁶³. This acknowledges the peculiarities of emerging digital firms whereby the blanket application of regulation may unfairly discriminate against innovating firms to the detriment of consumers. These agencies will need to interject when appropriate and investigate when necessary.²⁶⁴

South African competition policy and its enforcement is of a high quality and has contributed to an environment that motivates innovation. The Competition Act of 1998 is the bedrock legislation governing competition policy and law in South Africa. The Act seeks to promote efficient and competitive markets that guard consumers, achieve social and economic welfare gains and provide businesses of all sizes with equitable opportunity to compete²⁶⁵. The act saw the establishment of The Competition Commission of South Africa (CCSA), Competition Tribunal and Competition Appeal Court. entities in the oversight of South African markets. These three entities have been largely effective in achieving their mandate. A novel study by Truen and Rateiwa of demonstrates the relationship between innovation and growth in South Africa and then confirms that competition policy and the actions of the CCSA have had positive impact on the extent of innovation and contributed to an environment that stimulates firms to innovate²⁶⁶.

Amendments to the competition act improve the CCSA's ability to monitor and regulate digital firms and the markets that they disrupt. The Competition Amendment Bill was recently signed into law. The Bill strengthens the CCSA's powers in terms of market inquiries and the ability to involve itself actively in markets. The Bill empowers the CCSA to make recommendations to the Competition Tribunal and mandates the CCSA publish a report to the minister detailing recommendations²⁶⁷. In addition, the burden of proof is shifting to dominant firms to demonstrate that pricing is not anti-competitive. This action seems aligned with the OECDs recommendations. While it is yet to be seen whether the amendments will lead to better oversight of digital business, oversight of digital firms is not alien to the CCMA – the SA Meter Taxi complaint against Uber as operating anti-competitively was rejected by

²⁶³ Ndlovu, UBER vs. METERED TAXIS: A COMPETITION ISSUE OR A REGULATORY NIGHTMARE, 2017

²⁶⁴ *Ibid.*

²⁶⁵ Competition Commission of South Africa (2019) – Online

²⁶⁶ Truen & Rateiwa (2017) Competition Policy and Innovation: What does evidence in South Africa Show?

²⁶⁷ Online Media (2019) -South Africa: What the New Competition Amendment Act Means for South Africa's Economy -Mondaq

the Commission in 2016; the CCSA market inquiry into data services from 2017 to 2019 illustrates the CCSA's ability to engage with the nuances of digital markets²⁶⁸.

Assessment of the condition relies on interpretation of policy changes relative to emerging best practice. The quality and effect of South African competition draws from general sentiments and an innovative empirical study. A small set of indicators of the competition environment are available for international comparison however these would serve as proxies.

Supplementary data and empirics:

- Interviews with competition commission officials to assess self-perceived capacities and anticipated trajectory of competition law and enforcement in South Africa.

²⁶⁸ Competition Commission of South Africa (2019). Media Address on the Provisional Report of the Data Services Market Inquiry



South Africa has a strong though under-utilised foundation for innovation and the ability to respond to changing conditions. The Global Innovation Index (GII) uses a variety of indicators to measure the presence of innovation inputs and outputs in a country. South Africa ranks 58th of 126 nations and first on the continent in its combined input and output score²⁶⁹. A strong innovation input ranking at 48 is driven by the sophistication and maturity of its business environment and markets and the presence of strong academic and financial institutions. These inputs are being transformed into innovation outputs. For example, product and process innovations exceed continental averages while patents per person are higher than regional competitors and markets of comparable income²⁷⁰²⁷¹²⁷². Although impressive, South Africa's strong foundation for innovation is not being leveraged to its full capacity – South Africa's GI output score ranks 17 places lower than its input score, South Africa's ratio of technology imports to exports is most severe in high technology areas, and total factor productivity (a measure of the effective use of technology in production) has been deteriorating²⁷³²⁷⁴. This pillar investigates business innovation and flexibility to unpack the mechanisms that unlock business innovation.

This category looks at access to innovation finance and conditions that make innovation finance effective. These together come to create an environment where new products, processes and business models are conceptualised and have the opportunity to be tested and scaled. The pillar is broken into four clusters. The first cluster, innovative finance, measures the availability and effectiveness of innovation finance in four key areas: firstly, start-up and early stage finance for emerging business; secondly the availability of finance for established business through the banking sector and capital markets; thirdly business investment in R&D; and finally government investment in R&D and tax incentives facilitating private R&D investment. An Accenture report found that companies that are leaders in innovation enjoy an average of 42% return to innovation investment - 3 times higher than market averages²⁷⁵. The subsequent conditions measure aspects of innovative business that facilitate productivity in innovation investments and avoids wastage. The second cluster, non-financial investment support firstly reviews the South African start-up ecosystem and secondly assess the state of between business collaboration and cooperation. The third cluster, innovation culture measures business affinity to and process around innovation. This firstly assesses the state of innovation in South African entrepreneurs and secondly the state of innovation culture in South African corporates. The final cluster - access to and adoption of digital technology - is measured for emerging and established businesses.

²⁶⁹ WIPO (2018) Global Innovation Index.

²⁷⁰ WEF (2018) Global Information Technology Report.

²⁷¹ GEDI (2017). The Entrepreneurial Ecosystem of South Africa: A strategy for Global Leadership

²⁷² HSRC (2008). South Africa Innovation Survey Main Results

²⁷³ Department Science & Technology, NACI (2017). South African Science, Technology and Innovation Indicators.

²⁷⁴ World Bank (2017) South African Economic Update: Innovation for Productivity and Inclusiveness

²⁷⁵ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

Innovation Financing

Start-up and Early Stage Finance



There is a shortage of start-up and early stage financing for South African start-ups²⁷⁶²⁷⁷. Start-ups with a proven concept can experience rapid growth if supported with early-stage capital. South African start-ups have access to local capital across a range of investment instruments. A VC4A start-up survey found 49% of firms secured financing, at an average of USD 250k per entity.²⁷⁸ These are provided by 71 direct finance providers (of which 30% are foreign) including a maturing and well-run venture capital (VC) and private equity (PE) base and a growing angel investor network²⁷⁹²⁸⁰. The bulk of start-ups that receive funding (41%) source this capital solely from local players, however nearly 45% receive a combination of finance from international and local funders and 14% solely international funders²⁸¹. International interest in South African start-ups is growing positively. Local and foreign co-investment is important as foreign investors provide access to international markets while local funders are fundamental in identifying and grooming domestic start-ups to attract foreign partners.²⁸² Despite this development there remains a significant need for more risk capital in the USD 50k to USD 500k range.²⁸³

South Africa has a growing angel investor network which can be stimulated to increase support. There are a handful of visible angel investors in South Africa and angel investor associations such as the South African Business Angel Network, the Jozi Angels and SABAN. These associations promote knowledge sharing, diversify risk and facilitate larger investments through pooling of resources.²⁸⁴ Angel investors tend to be high-net worth individuals who may be seasoned and successful entrepreneurs that have exited their own tech ventures. More funding scale is needed from angel investors which could be stimulated by initiatives that deepen the culture of angel investment. Initiatives that attract and train new angel investors and bolster ties with international investors are further areas of intervention.²⁸⁵

Expansion phase funding in the form of venture capital (VC) and private equity (PE) is growing however there are few funds that cater for the specific needs of ICT start-ups. South Africa's traditional VC and PE market is growing with a strong history of returns and exits²⁸⁶.

²⁷⁶ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁷⁷ ANDE (2018). South Africa's Entrepreneurial Ecosystem

²⁷⁸ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁷⁹ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸⁰ ANDE (2018). South Africa's Entrepreneurial Ecosystem

²⁸¹ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸² VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸³ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸⁴ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸⁵ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁸⁶ VC4A (2018) Startup Ecosystem Analysis South Africa

Access to VC funding is considered above global averages and in line with BRICS comparators with 42% of the R1,160 million invested in 2017 considered growth capital and 57% seed and start-up^{287,288}. The PE market has grown at a 9.4% CAGR since 1994 to reach R158.6 million in funds under management in 2017²⁸⁹. Nearly 30% of PE investments were targeted at start-up and early-stage firms while 27.5% focus on expansion. There are only a handful of players dedicated to ICT and technology who have a grounded understanding of the specific needs of these kinds of businesses. RaizCorp incubate nearly 3,000 entrepreneurs a year and have seed funding available following POC while Cortex Logic is introducing a VC arm and developing a network of service providers by taking partial ownership of and nurturing emerging technology business.²⁹⁰

Despite these opportunities, the VC industry remains nascent while entrepreneurs remain relatively unsophisticated and struggle to motivate for and secure funding. Start-up and early stage funding would be bolstered significantly through government and donor investment in the VC sector as well as increased interest from institutional funders²⁹¹. This may increase availability of Round B funding and improve what tends to be an illiquid market with relatively few exits²⁹². Support can furthermore be provided to entrepreneurs seeking to source start-up finance. The bulk of entrepreneurs approaching VC and angel finance are ‘first rounders’ who lack skills in pitching and deter investors through unrealistic expectations and valuations, insufficiently developed growth strategies, and a lack of detailed competitor and market analysis which recognise the global scale of markets.²⁹³

Alternative financing sources are gaining traction and offer an innovative solution to the finance shortfall. Crowdfunding platforms have emerged as possible sources of working and growth capital for SMEs regardless of the regulatory uncertainty around them. The People’s Fund targets black owned business and has raised over R1.5 million for 12 campaigns. This includes MySurfer – a provider of low-cost internet access solutions – that required capital to install wireless access in 175 buildings and have since been successfully paying out investors. The People’s Fund is furthermore raising a working capital base for SMEs servicing government that suffer from long payment leads. The nascent industry provides a much needed (albeit costly) source of finance for SMEs. Promotion of the industry would improve visibility for SMEs and expand coverage however this should be paired with mentorship around the opportunities and risks of taking on alternative financing sources.

A host of surveys and market observations were used in the assessment of the condition. Surveys were constructed by industry associations. The growth of 12J is proxied by growth in the number of registered funds.

Supplementary data and empirics:

- Supplementary data should support National Treasury assessment of the funds and include the financials and employment records of firms invested in to track impact.

²⁸⁷ SAVCA (2018) Venture Capital Industry Survey

²⁸⁸ WEF (2017). Global Information Technology Report

²⁸⁹ SAVCA (2018). Private Equity Industry Report

²⁹⁰ World Bank (2017). South African Economic Update: Innovation for Productivity and Inclusiveness

²⁹¹ VC4A (2018) Startup Ecosystem Analysis South Africa

²⁹² VC4A (2018) Startup Ecosystem Analysis South Africa

²⁹³ VC4A (2018) Startup Ecosystem Analysis South Africa

Established Firm Finance



South Africa has a sophisticated and high quality banking sector which provides established business with access to finance. South Africa has a world-class financial system which ranks 18 of 140 markets in its efficiency, trustworthiness and confidence.²⁹⁴ This quality is reflected in the deep availability of credit, with domestic credit provided to the private sector estimated at 144% of GDP - in line with OECD averages²⁹⁵. South Africa's banking sector is a key financier of this credit at 66% of GDP and nearly 10% above global averages²⁹⁶. The banking sector is robust given its strong regulatory and legal framework and is competitive with a host of well-established and emerging institutions. The sector's quality is reflected in global awards. For example, the Lafferty banking 500 benchmarks 500 global banks in terms of their quality. South Africa graded 6th of 38 markets, with Capitec being one of eight banks to receive the highest possible rating.

Capital markets are well developed and provide established firms with a valuable public source of finance. South Africa's capital markets are large relative to global benchmarks with listed domestic companies' market capitalisation estimated at 321% of GDP – secondly only to Hong Kong²⁹⁷. South Africa subsequently ranks 25th globally in ease of raising capital through the public sale of shares.²⁹⁸ The Johannesburg Stock Exchange is recognised globally not only for its scale but also the quality of its reporting expectations of listed firms. Integrated reporting provides investors with clear and accurate details of business operations and financial health so as to judge their efficacy. The International Integrated Reporting Council ranked South Africa the top performing country in this regard. While the JSE is the cornerstone exchange, alternatives such as ZAR X and 4 Africa Exchange are slowing gaining traction.²⁹⁹ These platforms broaden business access to finance by altering the stringency of listing requirements and providing secondary listing opportunities to the JSE³⁰⁰.

South Africa is well recognised for the quality of its financial system and depth of capital markets. Internationally comparable surveys and indexes are used to demonstrate this and validated against a select sample of awards.

²⁹⁴ WEF (2018) Global Competitiveness Index

²⁹⁵ World Bank (2018)

²⁹⁶ World Bank (2018)

²⁹⁷ World Bank (2018)

²⁹⁸ WEF (2018) Global Competitiveness Index

²⁹⁹ COEFS (2017) The Impact of the 4th Industrial Revolution on the South African Financial Services Market

³⁰⁰ COEFS (2017) The Impact of the 4th Industrial Revolution on the South African Financial Services Market

R&D Investment



Government has set ambitious targets for GERD which has been growing in real terms since 2010 though falls short of benchmark countries. As of 2017, GERD equated 0.77% of GDP – akin to global and Indian averages however far below top performing BRICS nations and the OECD average of 2.5%³⁰¹. Government has set ambitious targets for GERD, seeking to double the 0.77% of GDP spent on R&D to 1.5% by 2020³⁰².

The scale of government expenditure on R&D is competitive relative to comparators and has been growing in real terms. Government accounted for 44.6% of gross expenditure on R&D in 2015 – aligned with the average of a sample of 68 countries including OECD benchmarks.³⁰³³⁰⁴ This share has been growing since 2013. Government prioritises spend on sectors that provide broad national benefits such as agriculture, education and medicine. Government expenditure on R&D has positive effects by contributing to GDP growth and sustaining ~40,000 jobs directly and indirectly in 2012³⁰⁵. This is far larger than the ~3,000 direct R&D personnel employed by government in 2012, illustrating the significance of its knock-on effects³⁰⁶.

Business is a key financier of R&D however spend falls short of leading innovative nations. The business sector is a key source of investment contributing 38.9% to GERD in 2016 and prioritising areas such as engineering, ICT and medicine.³⁰⁷ This places South Africa at 37 of 63 countries in business share of GERD and slightly below sample averages.³⁰⁸ Business expenditure on R&D has grown in Rand terms since the impacts of the global financial crisis waned in 2010 however business' share of GERD has slid by 3% since 2012.³⁰⁹ Business spend remains in shortage as access to finance has been noted as a common hindrance to innovation projects.³¹⁰ Innovation leading markets such as South Korea and China which have high GERD to GDP ratios are driven by spending by the business sector³¹¹. In these markets business contribution to GERD tends to account for over 70%³¹². South African business seems to be under-investing with an R&D to sales ratio far below OECD averages.³¹³

³⁰¹ UNESCO (2018). Institute for Statistics

³⁰² Online Media (2017). – *Government Aims to Double R&D Spend by 2020* – University World News

³⁰³ HSRC (2016) South African National Survey of Research and Experimental Development

³⁰⁴ UNESCO (2018). Institute for Statistics

³⁰⁵ Perrot *et. Al.* (2012) Government R&D Impacts on the South African macro-economy.

³⁰⁶ HSRC (2016) South African National Survey of Research and Experimental Development

³⁰⁷ HSRC (2016) South African National Survey of Research and Experimental Development

³⁰⁸ UNESCO (2019). Research & Development Spending

³⁰⁹ HSRC (2016) South African National Survey of Research and Experimental Development

³¹⁰ CLC Africa (2018). The State of Innovation Capabilities Report.

³¹¹ UNESCO (2019). Research & Development Spending

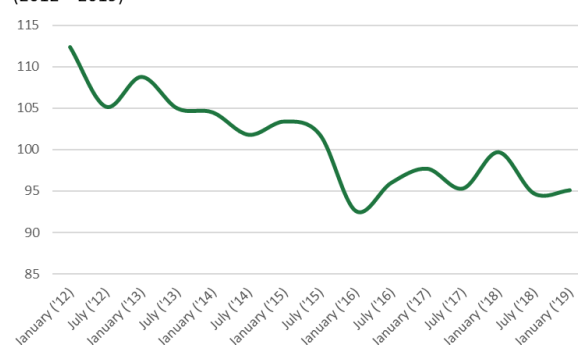
³¹² UNESCO (2019). Research & Development Spending

³¹³ World Bank (2018). Innovation activity in South Africa: Measuring the Returns to R&D

South African firms seem risk averse given attractive returns to R&D investment which may be attributable to low levels of business confidence. Local returns to R&D range between 118% and 294% exceeding those in France and the USA (28% to 78%), Taiwan (8% to 35%) and OECD averages.³¹⁴³¹⁵ As South African businesses contribute less to GERD than these markets, there is the possibility of risk adversity given challenging business conditions as illustrated by waning business confidence. Poor macro-economic and political conditions create uncertainty which depresses business confidence and the motivation to invest. This lack of confidence has significant effects as a 1% increase in business confidence has been estimated to raise economic growth by 0.23% through its impact on investment.³¹⁶

Business Confidence Index

(2012 – 2019)



Source: SACCI (2019) Business Confidence Index

Data used to assess this pillar is derived from national accounts for South Africa and international firms. Measures and trajectories are therefore robust. Estimates of returns to R&D are obtained from reputable sources.

Non-financial Investment Support

Start-up ecosystem



A rich start-up ecosystem provides the non-financial post-ideation support needed by the start-up community. South Africa has the most mature and robust start-up ecosystem on the continent which remains underdeveloped relative to leaders such as Silicon Valley and Israel³¹⁷. The ecosystem is private sector led with over 200 ecosystem participants and 90 providers which nurture start-ups through non-financial capacity development³¹⁸³¹⁹. These providers are concentrated in Johannesburg and Cape-Town with strong ties between



For Profit
(32)



Non- Profit
(22)



Government
(23)



Corporate
(23)

³¹⁴ World Bank (2018). Innovation activity in South Africa: Measuring the Returns to R&D

³¹⁵ World Bank (2017). South African Economic Update: Innovation for Productivity and Inclusiveness

³¹⁶ Jongh & Mncayi (2018). An Econometric Analysis on the Impact of Business Confidence and Investment on Economic Growth in Post-Apartheid South Africa

³¹⁷ VC4A (2018) Startup Ecosystem Analysis South Africa

³¹⁸ ANDE (2018). South Africa's Entrepreneurial Ecosystem

³¹⁹ VC4A (2018) Startup Ecosystem Analysis South Africa

the two hubs. These provide support for start-ups that have conceptualised a new product, service or process in the testing and eventual scaling of that good. The ecosystem network is key in the early stages of the start-up lifecycle. In South Africa access to networks, mentoring, marketing, and business strategy/planning are the most common forms of capacity development provided to emerging business³²⁰. Investor matchmaking and showcasing – important means of accessing finance – are uncommon.³²¹ The category and number of players are illustrated on the right. This ecosystem is yet to achieve critical mass and needs to transition to a focus on globalisation, pursuing access to international markets, and deepening pockets of specialisation in areas of emerging competitive advantage such as fintech and ICT³²².

The diverse community of incubators, accelerators and shared working space collectively meet the key criteria for this system to be effective: *There is access regardless of industry* with 55% of program providers being sector agnostic in Gauteng – a strong indicator of national trends³²³. Focused programs are concentrated in ICT and agriculture; ***support spans the start-up lifecycle*** and range of start-up requirements; ***there are efforts to broaden access*** such as The Innovation Hub³²⁴ developing a township network and the Awethu Project focusing on historically under-resourced participants; ***the ecosystem provides high quality support*** - the 2017 UBI global rankings of university linked business incubators and accelerators identified the LaunchLab as the top challenger in Africa, a position historically occupied by programs in other African countries. Additionally, CITI is Africa's oldest and one of the continent's most prominent incubators; ***the ecosystem facilitates access to capital*** with ecosystems participants more likely to access funding and ecosystem participants generally receiving 3 times the value of funding as their non-participant counterparts³²⁵.

The ecosystem's effectiveness can be improved through skills development, start-up tracking and coordination. The range and complexity of this ecosystem creates challenges for entrepreneurs as there lacks a focal point and ecosystem champion. An ecosystem coordinator could break down silos and align efforts while improving entrepreneur and provider visibility. Deepening start-up access to international networks and markets may lead to the emergence of global scale exponential businesses. This should be complemented by improving service provider capacity as there is a shortage of skill and experience at entrepreneur support organisations³²⁶. Performance tracking of accelerated, incubated and supported entrepreneurs would provide a base of knowledge to determine best practice and the processes that successfully leads to robust start-up growth³²⁷.

³²⁰ ANDE (2018). South Africa's Entrepreneurial Ecosystem

³²¹ ANDE (2018). Gauteng Entrepreneurial Ecosystem Snapshot.

³²² VC4A (2018) Startup Ecosystem Analysis South Africa

³²³ ANDE (2018). Gauteng Entrepreneurial Ecosystem Snapshot.

³²⁴ During 2017, nearly two thirds of startups being supported had an ICT focus illustrating how technology innovations specifically and innovation generally can emerge in all circumstances.

³²⁵ VC4A (2018) Startup Ecosystem Analysis South Africa

³²⁶ ANDE (2018). Gauteng Entrepreneurial Ecosystem Snapshot

³²⁷ VC4A (2018) Startup Ecosystem Analysis South Africa

The assessment drew on industry reports and research conducted by a renowned multi-national entity that conducts research on and advocates for entrepreneurs. Findings are a strongly guided interpretation of available anecdotal evidence regarding the scale and perceived quality of the ecosystem.

Supplementary data and empirics:

- Co-creation with incubators of an annual performance and trajectory tracker for incubated and accelerated businesses. This should further detail the nature and extent of support provided and business perceptions of the role the incubation program had in their failure/success.

Open Architecture

Appetite for collaboration between emerging and established businesses drive knowledge diffusion however challenges to engagement remain. At nearly 90% of surveyed firms, South African corporates have a keen desire to collaborate with emerging business, are intent on learning from competing firms, service providers and academic institutions and rank 28 of 119 countries in collaboration between industry and academia³²⁸³²⁹³³⁰ South Africa subsequently ranks 59 of 126 countries in innovation linkages.³³¹ Both emerging and established firms that are strong collaborators achieve higher levels of reported revenue growth – effective collaboration could raise SMME revenues by between 3% and 18% and established firm revenues by between 3% and 7%³³². However two points of friction remain: entrepreneurs have the perception that corporates are limited in their culture of entrepreneurship; large companies consider themselves committed to collaboration with entrepreneurs however entrepreneurs do not consider these large companies truly committed.³³³ In select circumstances cooperation has seen emerging firms embed themselves in larger corporations, the benefits of which are often diffused within the institution.

Innovation platforms that deepen links between emerging and corporate businesses are quickly being realised as key sources of co-creation and ideation. The majority of surveyed innovation leaders believe these platforms are core to business idea generation Dimension Data's collaboration with Silicon Cape seeks to improve entrepreneur knowledge of and comfort with collaboration and a platform for new thinking. This process is indicative of the rising value innovation leaders place in innovation networks and key to sensitising both players to the others' cultural norms and expectations.³³⁴ Open innovation platforms such as Zindi, Openix and the NTT Data Open Innovation Contest are gaining traction. These processes reflect business engagement with opening institution data architectures. The challenges of doing so are largest for incumbent firms with legacy infrastructure. However the use of APIs is increasingly common while a number of established entities (such as Standard Bank for example), are migrating to modern digital platforms that enable the efficient and safe flow of information within the business and with other businesses. While innovation platforms are

³²⁸ WEF (2018), Global Competitiveness Report

³²⁹ Accenture. (2016). Harnessing the Power of Open Innovation through Digital Collaboration – a \$12 billion Opportunity for South Africa.

³³⁰ PWC (2017). Global Digital IQ Survey.

³³¹ WEF (2018). Global Innovation Index

³³² Accenture (2016). Harnessing the Power of Open Innovation through Digital Collaboration – a \$12 billion Opportunity for South Africa.

³³³ Accenture (2016). Harnessing the Power of Open Innovation through Digital Collaboration – a \$12 billion Opportunity for South Africa.

³³⁴ Accenture (2016). SA Companies slow to innovate, Shows Accenture Innovation Index – Online report

improving between business collaboration, South African enterprise scores far above global averages in knowledge sharing within business and between business functions.³³⁵

Expert networks and external engagements are considered strong sources of new ideas and implementation support.³³⁶ Established businesses have access to international service providers such as Accenture and a handful of local providers such as Cortex Logic. These entities walk businesses along their digital transformation journeys and assist in the development and operationalisation of new technologies. A range of dedicated IT service providers cater to the specific ICT needs of SMEs.

Measuring the attitude towards and degree of collaboration relied on empirical data and interpretation of market analysis. Internationally comparable sources such as the WEF Innovation Index and Competitiveness Reports were validated against reports produced by respected consulting houses.

Innovation Culture

Entrepreneurship



South African entrepreneurs have positive attitudes, are innovative and capable of scaling given positive conditions however start-up skills require development. Approximately 75% of South African early-stage entrepreneurs are opportunity motivated as opposed to necessity driven.³³⁷ The share of opportunity motivated firms has been growing rapidly since 2001 implying that South African entrepreneurs are increasingly interested in and willing to pursue and exploit gaps in the market in the creation of value and the pursuit of growth. South African entrepreneurs are willing to embrace risks and rank second on the continent and 55th of 137 countries in their attitudes, aspirations and abilities.³³⁸ This is complemented by positive social and public perceptions of entrepreneurship.³³⁹ South African entrepreneurs are furthermore innovative with 48% believing they produce products that are new to some or all customers and 43% believing their products differ from those offered by other businesses.³⁴⁰ This is above continental averages with the GEDI assessment of the South African ecosystem suggesting there are no gaps in entrepreneurial capacity for product and process innovation.³⁴¹

Emerging businesses are positioned well to compete in the digital economy with the majority considering themselves well prepared to leverage the digital age and keep up with

³³⁵ Dell (2018). Digital Transformation Index.

³³⁶ CLC Africa (2018). The State of Innovation Capabilities Report.

³³⁷ GEM (2017). South Africa Report

³³⁸ GEDI (2017) The Entrepreneurial Ecosystem of South Africa: A Strategy for Global Leadership

³³⁹ GEM (2017) South Africa Report

³⁴⁰ GEM (2017) South Africa Report

³⁴¹ GEDI (2017) The Entrepreneurial Ecosystem of South Africa: A Strategy for Global Leadership

disruption³⁴². This has resulted in the emergence of an ICT start-up community which attracts foreign talent. There are over 1,500 ICT start-ups active in Johannesburg and Cape Town with both cities ranking well in the availability of experienced software engineers.³⁴³ These hubs of entrepreneurship are attracting foreign talent and outstrip upper middle-income city averages in the number of active entrepreneurs.³⁴⁴

Despite these innovative qualities and emerging digital orientation, the scale of South African entrepreneurial activity ranks poorly relative to competitors and gaps in start-up skills persist. Approximately 6.9% of adults are in the process of starting or who have just started a business. This is a downwards trend since 2014 and places South Africa at 52 of 65 surveyed countries.³⁴⁵ Compounding potential challenges in scale are foundational entrepreneurial skills.

Corporate Innovation



South African enterprise is in the middle stages of its innovation process maturity cycle. A key characteristic of successful innovation programs is the development of realistic innovation objectives that align with business goals complemented by innovation processes that resource wastage. A pilot survey of South African enterprise places respondents in 1 to 5 stages of innovation maturity with 1 ranking the lowest.³⁴⁶ This assesses awareness of both the need for and how to change innovation processes based on 6 clusters of innovation capabilities. The bulk of enterprise are in the early to middle stages of innovation maturity: 44% are at the second lowest, 'emerging' stage with some awareness, organised approach and occasional results. This is driven by strengths in innovation strategy. Approximately 33% and 7% are at the third and fourth stages respectively while none are at the highest stage. This distribution seems in line with international trends however raises slight concerns as 14% of business are at the first stage and have little to no formal appetite for and process around innovation.

South African enterprise are developing innovation strategies and are confident they can embrace the challenges of disruption. The middle to early stages of innovation reflect a growing entrenchment of and genuine institutional vision for innovation and an innovation strategy that increasingly aligns with and supports broader business strategy³⁴⁷³⁴⁸. Nearly 80% of South African enterprise consider innovation a strategic priority with the majority having innovation objectives appearing in business plans³⁴⁹. The processes is strengthening - 85% of

³⁴² SME South Africa (2018). An Assessment of South Africa's SME Landscape

³⁴³ World Bank (2017) South African Economic Update: Innovation for Productivity and Inclusiveness

³⁴⁴ World Bank (2017) South African Economic Update: Innovation for Productivity and Inclusiveness

³⁴⁵ GEM (2017). South Africa Report

³⁴⁶ CLC Africa (2018). The State of Innovation Capabilities Report.

³⁴⁷ CLC Africa (2018) The State of Innovation Capabilities Report.

³⁴⁸ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

³⁴⁹ Steyn & Bell - USB (2016). South African Management Index Report

Accenture surveyed firms are deploying dedicated innovation teams while a manager survey found 97% consider innovation an opportunity³⁵⁰. Regardless of the presence of laggards in the cultural readiness for innovation, business is generally confident that it will be able to meet changing customer expectations and the demand for trustworthiness.^{351,352,353}

Sophisticated and well-developed innovation processes are necessary to avoid investment wastage. Companies considered superior innovators with embedded strategies and committed programs realise nearly 3 times the returns on R&D as less effective innovators.³⁵⁴ Differences in innovation maturity therefore create important differences in innovation success. This may contribute to the fact that the number of South African enterprises that have experienced genuine bottom line growth due to investment in innovation are in the minority³⁵⁵. Maturing innovation processes and culture will see the emergence of lean innovation as a norm as opposed to an exception and the broader adoption of a fail-fast mindset³⁵⁶.

South African firms having varying abilities to leverage technology in their innovation efforts with the bulk of local firms in middle stages of digital maturity. The Dell digital transformation index is a business level survey that evaluates a market's digital maturity by ranking the digital transformation performance of companies from 1 to 5 with 1 being the lowest. South African firms fare well by global standards - 39% are in the middle or 'evaluator' stage with a gradual embracement of digital transformation and investment. Approximately 8% of firms are considered digital leaders at the top end – above global averages – while the instances of digital laggards that have little to no commitment to digital transformation are below global averages. The South African appetite for digitisation has led to some cases of exponential business however these are far less common than in leading markets, with local firms frequently emulating digital strategies of businesses in developed nations as opposed to building pathways appropriate for their own organisation.³⁵⁷ With 23% of business at the digital adopter stage – just before digital leader - there is a strong base of firms primed to build on learnings from digital leaders.

South African corporate leadership have an eye for innovation and digital strategy however more can be done to future-proof these talents Leaders in established businesses are enabling innovation and are a key strength in established business' innovation landscape^{358,359}. Clear leadership commitment to innovation is supporting business competitiveness, however surveyed business suggests the innovation competencies of leaders are sometimes inadequate and can create obstacles.³⁶⁰ South African CIOs and CEOs are believed to score below continental and global averages in their perceived ability to assimilate new

³⁵⁰ Steyn & Bell - USB (2016). South African Management Index Report

³⁵¹ PWC (2017). Global Digital IQ Survey.

³⁵² WEF (2018). Global Innovation Index

³⁵³ Dell (2018). Digital Transformation Index.

³⁵⁴ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

³⁵⁵ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

³⁵⁶ Interviews with Stakeholders conducted by Genesis Analytics, June - July 2019

³⁵⁷ Online Media. 2019. Accenture & GIBS report of digital competitiveness

³⁵⁸ CLC Africa (2018). The State of Innovation Capabilities Report.

³⁵⁹ PWC (2017). Global Digital IQ Survey.

³⁶⁰ CLC Africa (2018). The State of Innovation Capabilities Report.

technologies into an organisation³⁶¹. This translates into only 60% of managers believing top organisational leaders have the talent to address future challenges the business will come to face³⁶². Uncertainty around ‘what it takes’ for digital innovations to be operationalised and ‘what these can achieve’ can create misalignment in expectations between decision makers and service providers/ staff expected to execute on digitisation plans.³⁶³ This talent gap is compounded by the under-development of digital leadership programs in nearly 50% of business despite 67% of businesses considering digital leadership as at least important³⁶⁴.

South African enterprise are strengthening the innovative capabilities of their staff through flexible work arrangements and on the job learning³⁶⁵. These functions improve staff ability to pivot to new tasks and embed a staff-wide innovation mindset. Business access to skills are considered a key impediment to innovation processes.³⁶⁶³⁶⁷³⁶⁸³⁶⁹. Approximately 44% of South African enterprise believe their staff have the skills necessary to compete in the digital economy in contrast to 65% globally³⁷⁰. South African firms recognise the need to respond to this challenge with 76% believing a more fluid work force will improve innovation.³⁷¹ Employers are recognising the benefits of hiring freelancers at an on-demand basis to improve the rate at which skills can be sourced. Business is also increasingly investing in on the job learning, as discussed in the human capital pillar.

Findings relating to innovation maturity were primarily derived from a targeted survey of business enterprise and bolstered with support material. While sample size is small and sampling methodology uncertain, findings are internally consistent. Digital maturity is equally derived from surveys that rely on business perceptions.

Supplementary data and empirics:

- The *State of Innovation Capabilities Report* is a rich source of data for assessing business innovation processes and capabilities. The survey was a pilot. Scaling the number of businesses would contribute to representative outputs that complement research such as the HSRC Innovation Survey and data detailing spend on R&D and innovation.

³⁶¹ PWC (2017). Global Digital IQ Survey

³⁶² Steyn & Bell - USB (2016). South African Management Index Report

³⁶³ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019

³⁶⁴ BCG (2017) Human Capital Trends Report for South Africa

³⁶⁵ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

³⁶⁶ CLC Africa (2018). The State of Innovation Capabilities Report.

³⁶⁷ Dell (2018) Digital Transformation Index

³⁶⁸ PWC (2017). Global Digital IQ Survey.

³⁶⁹ Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019

³⁷⁰ PWC (2017). Global Digital IQ Survey.

³⁷¹ Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report

Attitudes to and adoption of digital technologies



South African firms have superior access to ICT services and the latest technologies. The Global Innovation Index suggests South African firms are above global medians in access to the latest technology, ranking 45 of 137 countries³⁷². This access provides the means of developing and scaling digitally enabled products and services. South African firms are leveraging this access and rank 28 of 139 countries in the adoption of new technologies³⁷³. The nature, rate and challenges to adoption differ for emerging and established firms.

Emerging business has an appetite for technology and disruption however there is division between the haves and the have nots. The majority of South African SMMEs have at least basic access to technology with 97% using a smart-phone and 94% using LTE networks.³⁷⁴ Firms without access are disadvantaged in their ability to compete in the digital and cannot access digitally enabled supply chains and leverage new customer channels and means of productivity. Although technology usage is expanding, 45% of emerging businesses have little to no new technology orientation and 50% consider technology access a challenge to growth and have insufficient skills for use^{375,376}. On the other hand, technologically oriented SMMEs are well positioned to compete and recognise the need to remain technologically relevant with almost 25% making use of the latest technology (on par with continental averages) and 30% using technology that is 1 to 5 years old (above continental averages)³⁷⁷. This has led to success stories in digital leaders such as Yoco and the eHealth Group. Emerging South African enterprises use innovation and technology more frequently than African and BRICS comparators and generally have a greater appetite for using new technology than established business³⁷⁸.

Established firms are believed to adopt new technologies more extensively than continental competitors and at a rate above global averages however many businesses seem to approach new technology cautiously and adopt a ‘wait-and-see’ attitude.^{379,380,381} This creates barriers to scaling the testing and development of new products, services and business processes. Usage of frontier and ICT technologies is set to grow following successful proofs-of-concept as illustrated by the findings of a survey of 400 large South African enterprises³⁸².

³⁷² WEF (2018). Global Competitiveness Index

³⁷³ WEF (2018). Global Competitiveness Index

³⁷⁴ SME South Africa (2018). An Assessment of South Africa's SME Landscape

³⁷⁵ GEM. 2017. A South African Perspective on Entrepreneurship.

³⁷⁶ SME South Africa. An Assessment of South Africa's SME Landscape

³⁷⁷ GEM. 2017. A South African Perspective on Entrepreneurship.

³⁷⁸ Department Science & Technology, NACI. 2017. South African Science, Technology and Innovation Indicators.

³⁷⁹ WEF (2018). Global Information Technology Report.

³⁸⁰ Online Media. (2018). Citrix Survey - 'Digital Adoption Key for SA Business'

³⁸¹ Online Media. (2018). Citrix Survey - 'Digital Adoption Key for SA Business'

³⁸² Online Media. (2018). World Wide Worx Survey - 'The Mobile Corporation in South Africa'

- Internet-of-Things (IOT) is the most commonly adopted frontier tech. IOT has the largest appetite for non-user adoption while 100% of current users plan to increase use;
- Big data and Machine Learning has been explored by a small share of business. Over 70% of current users aim to expand usage while 60% of non-users intend on adopting;
- Virtual reality has been tested by a handful of businesses however the desire for further adoption seems limited relative to other technologies;
- Robotics is in its nascency with a moderate intent for further expansion;
- Blockchain technology is little used and shows low levels of interest relative to other frontier technologies however adopters embrace the opportunity for further expansion.
- While frontier technologies gain traction, the pervasive use of cloud computing continues to expand in emerging and established businesses. The technology is being used to enhance productivity as it is considered by business as a means of international expansion and improving time to market and speed of development.³⁸³

Across all frontier technologies (with the exception of robotics) cost was not the most common impediment to adoption. This implies that deeper factors such as attitudes to innovation, institutional culture and skills are key in unlocking the effective use of technology. These capabilities would support institutions' abilities to identify processes that can benefit from the application of technology.

Assessing emerging business use and access to new technologies relies on respected international sources that enable cross-country comparison. The use of frontier technologies and general access to new technologies are derived from surveys that rely on business perceptions, have small or unknown sample sizes and may therefore suffer from bias.

Supplementary data and empirics:

- An enterprise survey with a representative sample size targeted at businesses of all sizes should be used to assess: the extent and nature of technology usage; the firm perceived abilities to adopt further technologies; and barriers inhibiting adoption

³⁸³ Online Media. (2019). World Wide Worx Survey – 'Cloud Africa 2018'.

Constructing Ecosystems



In addition to the individual systems required to support economic opportunities, a critical readiness factor is the ability for these systems to interact with one another and be co-ordinated around specific opportunities. Large systems such as digital infrastructure, human capital, and the public and private sectors often operate in silos and are not automatically co-ordinated – either within their respective systems or between systems. This limits the potential for economic opportunities to be realised and scaled because important inputs are not being aligned.

There are a number of organisations and processes which serve to play a facilitating and co-ordinating role for these opportunities to be realised and scaled. These range from formal institutions that have been set up by the state to less formal relationships and partnerships that aim to strategically co-ordinate disparate stakeholders to achieve common goals. This section investigates how this is playing out in South Africa in the four areas: business-to-business co-ordination, public private solutioning, ecosystem stewards, and access to global markets.

Business-to-business co-ordination



South Africa has relatively well-developed organised business with a large presence of industry and apex business associations. There are over 18 business councils and business support organisations in South Africa. Further, there are various export councils and trade associations for the respective industries. Some examples include the South African Chamber of Commerce (SACCI) which is the largest business association in South Africa; National Small Business Chamber (NSBC) which is a membership based organisation that protects and promotes small businesses, and Business Unity South Africa (BUSA) which represents South African businesses on national and international levels, as well as a number of industry bodies.³⁸⁴

In South Africa, there is more emphasis on the role of business councils as advocates for the private sector for concerted political action. These councils have been pivotal in promoting good governance and sound policy making to improve the ease of doing business in South Africa and to increase the role of business in economic growth and development.³⁸⁵ However, it is not clear whether these associations have taken the responsibility to coordinate

³⁸⁴ Genesis Analytics Team Analysis 2019

³⁸⁵ Genesis Analytics Team Analysis 2019

businesses to develop industry-specific value propositions and market to global players.³⁸⁶ Some industry-specific associations have taken on this role, for example in the GBS sector Business Process Enabling South Africa (BPESA) has re-emerged as a key stakeholder that aims to coordinate the GBS sector in sourcing market intelligence and crafting a value proposition that can be marketed to the global players.³⁸⁷

This lack of industry co-ordination is evidenced by the fact that most market intelligence practices are conducted at a firm level. Nearly 60% of businesses in SA say that they have a formal market intelligence function in their organisation with 65% of businesses having this function in operation for more than 5 years.³⁸⁸ However, most of the collaboration that takes place between businesses appears to be face to face and ad hoc on an informal basis. Only a few companies have a central coordinating point for gathering market intelligence. This lack of coordination makes it difficult for industries to present a unified and succinct South African marketing package to the world.³⁸⁹

It is unclear which bodies should be responsible for co-ordinating businesses across a sector to gather market intelligence and craft sector-specific value propositions. Industry associations, individual businesses or the DTI could individually or collectively take up this responsibility. Marketing processes are still very much at an individual business level, which is in the early phases of development and is gaining prominence.³⁹⁰

The measure relies on a base of anecdotal evidence and academic publication validated against stakeholder insights. The assessment acknowledges that BPESA may not be the sole entity playing a coordinating and intelligence sourcing role. However, in the absence of visible alternatives, it is feasible to conclude that entities playing similar roles are scarce.

Supplementary data and empirics:

- Cross-industry stakeholder interviews accompanied by a narrow survey can be used to measure the extent of business cooperation, effectiveness of organised business and identify emerging champion coordinators. This information should be publicised to provide business with visibility.

Public private solutioning



In addition to business-to-business co-ordination, channels for co-operation between private and public sector stakeholders are critical for solutioning in specific areas of opportunity. While organized business is an important contributor to private sector advocacy, it is often constrained by the need to achieve consensus among a diverse set of private sector interests rather than advocating for the changes required to support specific

³⁸⁶ Genesis Analytics Team Analysis 2019

³⁸⁷ Based on Stakeholder interviews conducted by Genesis Analytics, February-March 2019

³⁸⁸ Du Toit & Sewdass (2015) Competitive intelligence in emerging economies: A comparative study between Brazil and South Africa

³⁸⁹ Du Toit & Sewdass (2015) Competitive intelligence in emerging economies: A comparative study between Brazil and South Africa

³⁹⁰ Du Toit & Sewdass (2015) Competitive intelligence in emerging economies: A comparative study between Brazil and South Africa

opportunities.³⁹¹ As such, there is a need for organisations and structures which allow public and private sector stakeholders involved in a specific sector/opportunity area to co-develop solutions to specific problems that are constraining inclusive growth.

South Africa has a number of institutions and ad-hoc structures designed to facilitate public private engagement. Broad stakeholder consultation for economic policymaking is legislated through the National Economic Development and Labour Council (NEDLAC) Act of 1994. NEDLAC is a vehicle through which government, labour, business and community organisations can co-operate on economic, labour and development issues in the country.³⁹² In addition to this permanent structure, there are also ad-hoc structures which provide a similar role for specific national development objectives. For example, the Presidential Jobs Summit held in 2018 under the auspices of NEDLAC brought together representatives of government, private sector, unions, and community organisations to deliberate on solutions for South Africa's employment crisis. The outcome of the Summit was a Framework Agreement consisting of high-impact actions to drive job creation, job retention, and economic growth.³⁹³

However, these institutions and structures are often not effective at arriving at solutions for specific areas of opportunity. The nature of nationally-representative consultation and bargaining is such that actions required around specific opportunities are often lost. A recent development in South Africa is aiming to address this issue directly. The Public Private Growth Initiative (PPGI) brings together business and government leaders in specific sectors to design 5 year growth strategies in each sector by identifying specific projects and the public sector enablers required for them to scale. More detail on the initiative is provided in the box below.

The recent Public Private Growth Initiative is a good example of a structure set up to create public private solutioning around specific opportunities

The PPGI has been convened by the Minister in the Presidency to bring together business and government leaders to identify and plan for specific growth projects within each sector.³⁹⁴ There are 24 sectors that are represented by the initiative which was inspired by the sector-based reconstruction and development model adopted by Japan after the Second World War.³⁹⁵ Business leaders and the Director Generals of relevant government departments have been meeting to discuss projects with the potential to unlock growth in each sector, and identify the enablers that government must have in place for these project to succeed.

The outcome of the initiative will be a consolidated plan detailing identified projects in each sector and the required actions for these projects to scale. This will be incorporated into the country's economic planning process after the May 2019 elections. The PPGI represents a fundamentally different approach to public private co-ordination where the focus is on deriving sector-specific strategies rather than national consensus-building and negotiating between various stakeholders.

³⁹¹ Nelson (2014). Innovative Platforms for Public-Private Dialogue, 2014 *Brookings Blum Roundtable*, The Brookings Institute

³⁹² NEDLAC (2017). Growth Equity and Participation

³⁹³ NEDLAC (2018). The Presidential Jobs Summit Framework Agreement, 4 October 2018

³⁹⁴ The Presidency (2019). Public-Private Growth Initiative believe high-growth South Africa within reach, *Presidency on the Public-Private Growth Initiative meeting*, 29 January 2019

³⁹⁵ Online Media (2019). - *Public-Private Growth Initiative identifies 18 priority projects to unlock growth* - Engineering News

The measure captures the complexities of decision making within multi-agent systems through readings of regulation and observation of developments in the market. The nature of the measurement means data related evidence would need a highly accurate focus to be meaningful.

Supplementary data and empirics:

- Given the impending mobilisation of the PPGI, assessment frameworks to track represented industries need to be developed and used to assess PPGI effectiveness.

Ecosystem stewardship



Organisations that can catalyze cross-sectoral partnerships and develop common agendas for change play an important role in realizing economic opportunities. These organisations are sometimes referred to as collaborative intermediary organisations (CIOs) because they provide the “glue” that brings different parties together to collectively solve problems or realise opportunities³⁹⁶. These organisations, which are referred to as ecosystem stewards in this study, can be public, private, or social enterprises – or some combination thereof – whose purpose is to play one or more of the following roles:

- Unlock funding and other resources for a specific problem or opportunity among a set of stakeholders that typically do not co-ordinate support
- Convening disparate stakeholders that do not ordinarily engage with one another around specific problems or opportunities, and setting a common agenda or goal among them
- Acting as a relationship and trust broker among these stakeholders, particularly where there are opposing interests that give rise to conflict
- Coordinating actions required by the set of different stakeholders in order for solutions to be developed and opportunities to be unlocked
- Providing information and analysis which supports the formulation of common agendas and required actions, and monitors the effectiveness of these actions

South Africa has a number of organisations playing this ecosystem stewardship role across a number of areas and with a mix of models. A 2016 study by the Labour Market Intelligence Partnership identified a number of intermediary organisations successfully playing some of the roles describes above across the sugar, automotive, and astronomy sectors in South Africa.³⁹⁷ Another study from 2014 identified a number of collaborative intermediary organisations operating in the urban regeneration space in Cape Town and Johannesburg.³⁹⁸ However, these organisations are not widespread and could be replicated across a number of

³⁹⁶ Hamann & April (2013). On the role and capabilities of collaborative intermediary organisations in urban sustainability transitions

³⁹⁷ Peterson, Kruss, McGrath, & Gastrow (2016). Bridging skills demand and supply in South Africa: The role of public and private intermediaries

³⁹⁸ Souday (2014). Towards value generating capabilities for collaborative intermediary organisations

sectors, particularly if there is additional research on understanding where these models work best.³⁹⁹

Ecosystem stewards with strong private sector involvement may provide an added advantage. The Labour Market Intelligence Partnership study argues that private sector intermediaries should be more widely recognized because they bring the necessary expertise and social capital to provide sector-specific strategies and can enlist support from public intermediaries as needed. One of the most notable ecosystem stewards in South Africa, the Harambee Youth Employment Accelerator, is a social enterprise that was incubated by a large investment holding company in South Africa. One of the drivers of Harambee's success is the involvement of the holding company's subsidiaries in its partnerships.⁴⁰⁰ More detail on the Harambee model and its outcomes are provided in the box below.

Harambee – pulling together to solve youth unemployment in South Africa

The Harambee Youth Employment Accelerator is a social enterprise that was incubated by Yellowwoods, an investment holding company with businesses across a number of sectors in South Africa and elsewhere. Harambee matches the skill demands of employers in South Africa with the enormous potential of unemployed young South Africans. It does this through a model which sources, screens and upskills young South Africans to take up jobs among Harambee's partner companies. In executing on this core model, Harambee has played a critical ecosystem steward role by convening, mediating, and motivating to action key stakeholders around specific blockages to youth employment in South Africa.

Harambee's core model involves a six step process, as depicted in the diagram and elaborated on below⁴⁰¹:



Harambee engages in extensive **job profiling** among its more than 200 partner firms to understand what jobs are required and the skills and behavioural attributes of successful employees for these jobs. Harambee also **sources and screens** a large database of potential candidates who are locked out of formal employment and who have less than 1 year of work experience. The candidates are assessed using Harambee's own assessment instruments and **matched** to appropriate job opportunities given the candidates capabilities, preferences, and geographical location. Candidates are provided with **work seeker support** in the form of interview skills, opening email accounts, writing CVs, etc. Candidates are provided with **step-up and bridging** training to improve behavioural and basic competence for the work place. Candidates are then **placed into jobs** within Harambee's network of partner firms based on their capabilities and aspirations. Lastly, **retention** is supported through mentoring and coaching candidates and employers to support the candidate's integration and retention within the job.

Harambee's success is partly attributable to its innovative data-driven approach to executing this model. The organisation uses a cloud-based IT infrastructure to incorporate cost-effective data analytics and machine learning algorithms as the basis of its job matching service.⁴⁰² Its candidate sourcing and screening has created the largest and richest database on unemployed young people in South Africa, allowing for matching to be conducted on the basis of capabilities as well as geographic attributes that take informal and multi-transport

³⁹⁹ Sonday (2014). Towards value generating capabilities for collaborative intermediary organisations

⁴⁰⁰ Based on Stakeholder interviews conducted by Genesis Analytics, February-March 2019

⁴⁰¹ Altbeker (NY), *Harambee Employment Accelerator (Case Study from South Africa)*

⁴⁰² Google Cloud (NY) *Harambee Youth Employment Accelerator: Solving the youth unemployment challenge*

routes into account. It includes predictions of behavioural metrics, such as which candidates are most likely to leave a job within the first year of employment.⁴⁰³

Another central driver of Harambee's success has been its ability to construct partnerships. The Harambee model depends specifically on partnership with the employing companies in its network. Having been incubated by a large investment holding company that directs a number of companies in South Africa, Harambee was able to show how its model unlocked value for these companies in order to get other companies to join the partnership. In addition, Harambee has built strong partnerships with the Department of Higher Education, Department of Monitoring and Evaluation, the National Youth Development Agency, and a number of provincial and local stakeholders to unlock resources and tackle specific issues acting as blockages to youth employment creation in specific sectors.⁴⁰⁴

Ecosystem stewards are an emerging organisational form. Measuring the impact of these organisations is simpler when their effects are direct (as with Harambee) though more complex if effects are indirect and less visible (as with the successful coordination of entities) The condition therefore considers the prevalence, importance and trajectory of stewards in key systems.

Supplementary data and empirics:

- A broad enterprise level survey assessing business awareness of relevant stewards that come into contact with their operation. This should be coupled with assessment of where stewards have been effective. Results should be publicised.

Access to global markets



South Africa have incentives, marketing and support structures that are crucial for export promotion. These channels allow South African capabilities to be signalled and marketed to the global market. While there is evidence of success, a gap remains in access for small scale enterprise and coordination amongst export promoting entities.

South Africa has an export promotion capability through its dedicated export promotion vehicles such as BrandSA and InvestSA. InvestSA is a division of the DTI and South Africa's national investment promotion agency which provides interested investors with information and support in accessing the South African market. The entity was recently recognised for its performance winning the global Investment Promotion Award at the 2019 Annual Investment Meeting and received an UNCTAD award of excellence in 2016⁴⁰⁵. InvestSA houses 'a one-stop shop' where information about sector-specific skill value propositions can be accessed and used for marketing SA capabilities to the global market. BrandSA is the official marketing agency tasked with developing and implementing a proactive marketing and communication strategy for South Africa. Its role is to create a positive, unified image of South Africa, promote

⁴⁰³ Google Cloud (NY) *Harambee Youth Employment Accelerator: Solving the youth unemployment challenge*

⁴⁰⁴ Wilson-Prangley and Ngosi (NY) *Urban Youth Unemployment – The case of Harambee, a Youth Employment Accelerator*

⁴⁰⁵ South African Government (2019). – *Trade and Industry on Investment Promotion Award* – Online Media - South African Government

investment and tourism, and help new enterprises access foreign opportunities. However, BrandSA does not have a specific targeted marketing strategy for new and emerging industry capabilities, and there are very few official publications on South Africa's sector and skill value propositions that can be easily accessed.⁴⁰⁶ This suggests there is room for improvement in coordination.

The DTI has been taking on a few of these roles and assisting businesses through the Export Marketing & Investment Assistance Scheme (EMIA). This scheme provides export marketing and investment assistance to businesses that develop export markets for South African products and services and recruit offshore opportunities to South Africa. It assists with the identification of new export markets through market research and helps companies strengthen their competitive advantage by supporting patent registrations, quality marks and product marks.⁴⁰⁷

Accessing the global market for businesses is supported by the DTI through international investment missions and facilitation by DTI representatives stationed world-wide. The DTI together with industry and businesses, facilitates joint marketing trips to investor countries. The goal of these marketing trips is to allow South African companies to meet analysts, consultants, advisors and business executives from destination countries and outsourcing vendors. During these visits businesses get to exhibit their offerings at tech expos and conference events and promote South Africa as a competitive offshoring destination.⁴⁰⁸ Another marketing channel available to businesses are the relationship brokers who facilitate connections between South African businesses and potential customers in specific markets, such as the business process outsourcing industry.

Access to these marketing channels is limited for smaller players who lack awareness of these services or the capital to pay for such connections. However, the DTI compensates businesses for costs incurred recruiting in new FDI into South Africa.⁴⁰⁹ This contributes to broadening access and may facilitate the growth of emerging firms. In order to scale these initiatives the DTI would have to increase its capacity to support emerging industries as well those that might emerge in the future.

There are some pockets of coordination and marketing excellence outside of InvestSA. Cape Town is the largest outsourcing destination in South Africa and is currently ranked 21st in the world by the Financial Times for its investment promotion brand strategy.⁴¹⁰ This achievement has been largely attributed to the Invest in Cape Town Strategy that identifies opportunities for businesses and provides information on eight high-growth sectors of the

⁴⁰⁶ Genesis Analytics Team Analysis 2019

⁴⁰⁷ DTI (2019) Trade, Exports & Investment

⁴⁰⁸ DTI (2019) Trade, Exports & Investment

⁴⁰⁹ DTI (2019) Export Marketing and Investment Assistance

⁴¹⁰ CFO South Africa (2017)

economy for investment.⁴¹¹ This makes business decision making easier and has seen a number of companies setting up their headquarters in Cape Town.⁴¹²

Access to global markets is evaluated in terms of the presence and perceived effectiveness of coordinating and dedicated entities. The direct economic impact of export and investment promotion is difficult to estimate and divorce from trends.

Supplementary data and empirics:

- A targeted survey of firms to which South Africa exports and firms recently invested in SA to determine the role export and investment promoting agencies played in the decision.

⁴¹¹ City of Cape Town (2018)-Invest in Cape Town

⁴¹² City of Cape Town (2018)-Invest in Cape Town

Alternative Opportunities

A host of alternative opportunities not contained in the opportunity zones were identified. These were not included as they either did not meet the employment creating criteria of an opportunity, shared characteristics and dynamics with other opportunities or are embedded in the current opportunity zones. These opportunities and the motivation behind not including them are summarised below:

- ***Improving educational outcomes through digital content delivery and shared educational resources*** – employment effects are limited while education is better characterised as a core system upon which other opportunities rest. Digitisation of entities is captured within the frontier tech opportunity zone.
- ***Improving the delivery of government services*** – the primary gains are efficiency and service delivery. The levers of change are limited while the means of change captured in the frontier tech opportunity zone.
- ***Supporting resilience in agriculture and growth of smallholder farmers*** – the primary sources of employment growth in the agricultural sector are through providing smallholder farmers with access to supply chains and improving the productivity of smallholder farmers. The prior is reflected in the digital platforms opportunity and the latter largely matter of access to information that can improve productivity, again captured in the digital platforms opportunity. The use of frontier technologies to improve resilience to changing weather conditions is reflected in the frontier tech opportunity zone.
- ***Pursuing the future of production in PGM manufacturing*** – the sector is capital intensive and therefore offers limited employment opportunity. The dynamics of achieving this are captured in the frontier technology hub opportunity zone.
- ***Social sharing and central help facilities*** – these are similar in nature to digital platforms that deliver knowledge-based services.
- ***Solving the shortage of healthcare practitioners through remote diagnostics*** – the use of technology for remote diagnostics can broaden public access outside of cities, improve the quality of services offered and reduce congestion at top tier facilities. However, this comes with limited direct employment gains with the mechanisms largely captured in the current opportunity zones.
- ***Improving the distribution of medication along the medical supply chain*** – effective supply chain management with predictive capabilities at the distribution-point level can improve consumer access to medication and avoid shortages. However, employment creation is limited, the mechanisms are largely captured in the current opportunity zones and there is ongoing efforts to improve operation of these supply chains through technology.