



# Tech entrepreneurship ecosystem in South Africa

2018



**OC&C**  
Strategy consultants

Commissioned by 

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# Preface

The digital era has brought a fundamental shift in the global economy, pushing the limits of innovation and redefining the boundaries of global trade. Innovations have never been faster paced, more widespread, or scaled up more quickly, creating billion-dollar “unicorns”. Over the last 15 years, the ICT sector – as a backdrop to innovation and digital advances – has seen its share grow from just 1.3 percent of the global economy to 3 percent, and it’s set to grow even more.<sup>1</sup>

Nations that nurture a digital- and innovation-based culture have pioneered the global shift toward knowledge-based industries and have enjoyed extraordinary wealth (and job creation), while transforming the way people live and do business. This shift is made possible by substantial tech entrepreneurship activity within a supportive environment that includes both government and private-sector contributions. Initiatives by leading countries are now regarded as best practices for aspiring nations that want to create a similar impact, and the global conversation around regulation and innovation policies is framed around such practices.

Countries that are more reliant on manufacturing or natural resources are eager to capture a bigger share of the expanding digital economy. In order to deliver on these aspirations, they are exploring ways to transform the fundamentals of their economic structures and to deploy more resources to cultivate competitive tech entrepreneurship ecosystems. Establishing high-impact tech entrepreneurship as a sustainable source of employment is especially critical for nations with young populations and a need for new sources of job creation.

Given the importance of strong fundamentals in attracting both domestic and global interest in the tech entrepreneurship ecosystem, countries which fail to make broader reforms in education, good governance and create a business environment that supports entrepreneurship risk falling behind.<sup>2</sup>

Google has commissioned this study to identify areas for improvement in policies and regulations which affect tech entrepreneurship in South Africa, as part of a six- country study that includes the Russian Federation, Turkey, Nigeria, United Arab Emirates (UAE) and the Kingdom of Saudi Arabia (KSA).

For the purposes of this study, entrepreneurs are defined as those individuals who focus on building a rapidly scalable business venture with the aim of innovating, improving, or transforming the current way of doing things.<sup>3,4</sup> The entrepreneurship domain, according to our definition, includes the ‘startup’ and ‘scale-up’ phases of the business lifecycle when companies experience high growth in revenues and numbers of employees while validating their value proposition. Furthermore, we specifically address technology-driven entrepreneurship – companies with technology-enabled business models and a focus on hyperconnectivity between networks, people, businesses, things, and hardware.

Using these definitions, we began with comprehensive research of existing literature to identify factors that correlate with tech entrepreneurship success. We identified seven components explaining the strength of the ecosystem that supports tech entrepreneurship, while economic contribution and innovation creation measures pointed to the results achieved.

In our view, the inputs that form the preconditions for success and the resulting outputs feed each other in an iterative process, which determines the health of a tech entrepreneurship ecosystem.

<sup>1</sup> Selvam, M. and Kalyanasundaram, P. “Global IT/IT Enabled Services and ICT Industry: Growth & Determinants.” [http://globalbizresearch.org/Chennai\\_Symposium/conference/pdf/C549.pdf](http://globalbizresearch.org/Chennai_Symposium/conference/pdf/C549.pdf) (accessed September 27, 2017)

<sup>2</sup> World Bank. “Digital Dividends.” <http://www.worldbank.org/en/publication/wdr2016> (accessed September 27, 2017)

<sup>3</sup> Schumpeter, J. 1942. Capitalism, Socialism, and Democracy. New York: Harper & Bros.

<sup>4</sup> Global Entrepreneurship Monitor (GEM) Global Report 2016/17, Global Entrepreneurship Research Association 2017



Factors such as the quality, connectedness, and efficiency of a tech entrepreneurship ecosystem – which we refer to as the inputs – create the conditions for sustainable success. Meanwhile, effectiveness in generating tangible results such as growth, employment, the creation of wealth along with further innovation – the outputs – cultivates a stronger ecosystem by attracting more of the required inputs. This holistic perspective is reflected in the framework we used to assess tech entrepreneurship success.

Based on our assessment, we identified leading and emergent countries in tech entrepreneurship, putting the USA, Singapore, Israel and UK at the top of the list. Identifying successful countries provided a filter for selecting best practices as well as setting performance indicators that aspiring countries such as South Africa can use to assess their status, identify improvement areas, and apply approaches that fit the nature of their own ecosystems.

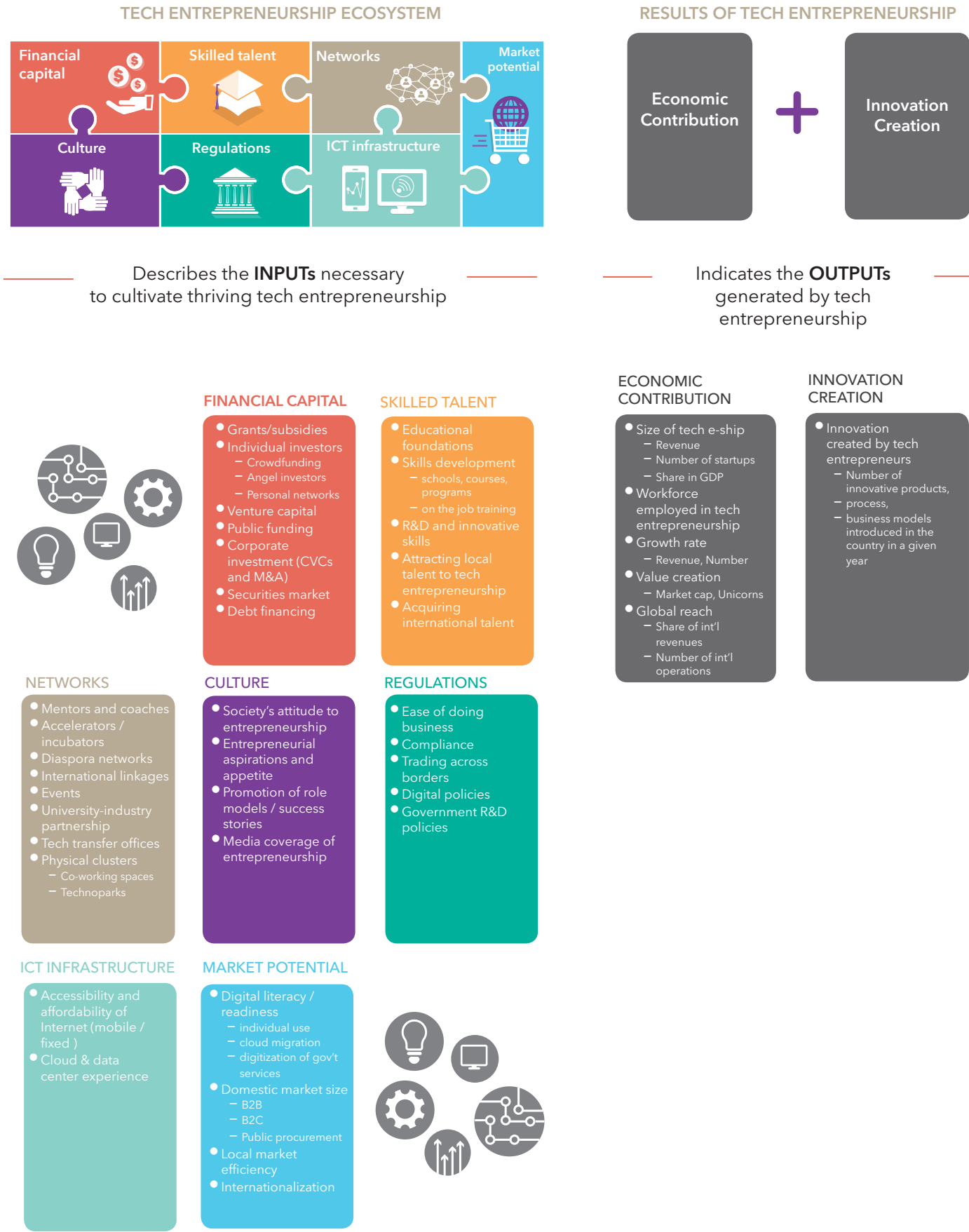
While doing this we also put South Africa’s status in context, we have compared input and output indicators for South Africa against a peer set of countries with comparable development stages, similar characteristics, or geographic proximity.

In the final stage of the study, we conducted extensive primary research in South Africa to complement the desk research. Whereas the desk research served to develop the structure of the tech entrepreneurship ecosystem and identify current initiatives that are in place to cultivate it, we gained insights and understood the context and impacts by conducting bespoke research with ecosystem participants, together with technology law firm EndCode. The policy recommendations that are part of this report are suggestions from the South African entrepreneurial community for further policy initiatives that will help strengthen the development of the tech entrepreneurship ecosystem in South Africa.

In total, we interviewed 25 stakeholders (representing different components of the ecosystem), spanning public and private as well as institutional and individual perspectives. The full list of participants is presented in the Acknowledgments section.

# OC&C’s framework for assessing tech entrepreneurship success

FIGURE I: THE TECH ENTREPRENEURSHIP ECOSYSTEM IS REPEATEDLY STRENGTHENED WITH TANGIBLE ECONOMIC RESULTS AND INNOVATION





# Tech entrepreneurship ecosystem – Inputs

The tech entrepreneurship ecosystem and its components constitute the inputs in OC&C's tech entrepreneurship success assessment.

One definition of an entrepreneurial ecosystem is:

*"a set of interconnected entrepreneurial actors, organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies), and entrepreneurial processes (e.g. the business establishment, growth, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment."*<sup>5</sup>

OC&C's Tech Entrepreneurship Ecosystem Framework (Figure II) presents the attributes outlined above, and the way in which they interact and influence one another. These seven components, working together, provide the habitat needed to generate successful tech entrepreneurship.

Best-in-class countries are able to offer **equity funding** sources in greater volume and variety (i.e. business angels, venture capital firms, and government investment funds). **Deep and efficient stock markets and the high frequency of deals** make the entrepreneurial challenge financially worthwhile and are instrumental in drawing in more resources – in terms of funding, skilled talent, and support – into the ecosystem.

These countries have a larger number of **highly skilled** employees and a labor force created by **education systems and talent attraction initiatives that support tech entrepreneurship**. These ecosystems are characterized by a **greater pool of scientists, engineers, and research universities** that foster an innovation culture.

Benchmarks demonstrate a superior level of **network development** that is characterized by the availability of entrepreneurial networks, startup associations, accelerators, incubators, co-working spaces, technoparks, etc. There are **stronger innovation linkages between academia and the private sector** such as joint-venture/strategic alliance deals, and industry-university collaborations.

In the best-practice countries, there is a higher **individual risk appetite**, coupled with **cultures that are more supportive of entrepreneurship**. **It is easier and less bureaucratic to start and run** companies as an entrepreneur, and the **risk of failure is better managed**.

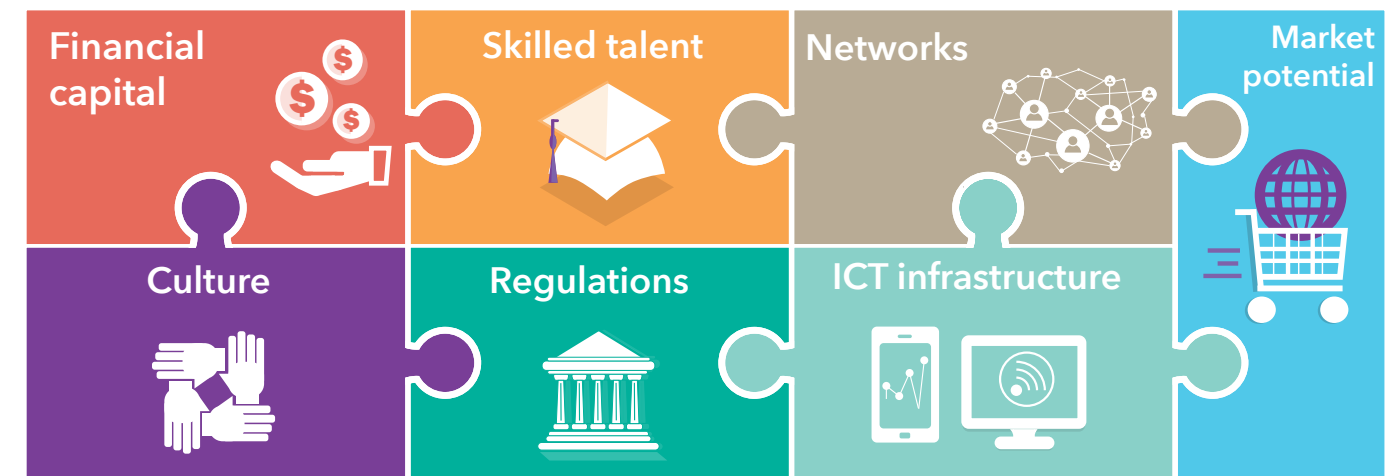
**Supportive digital policies** – laws related to data flow, cybersecurity, data privacy, IP protection, etc. – and **strong innovation capacity** steered by governments' R&D policies provide a sturdy backbone for the ecosystem. **Open foreign trade policies** enable these countries to internationalize their businesses.

Another fundamental differentiator is **reliable fixed and mobile internet infrastructures at affordable prices**. Digital policies that support **cross-border data flows** lead to **higher utilization of efficient, cost-effective global cloud services**.

Lastly, we also see that leading countries possess **considerable (rich) market potential and those that don't have a big enough market are globally oriented** from the start. In the domestic market, **consumer digital literacy is of great importance** as **consumers are then more likely to try new digital products**, thus creating attractive market conditions for B2C companies. In addition, advanced markets are efficient and competitive, with minimum barriers of entry for business startups.

<sup>5</sup> Mason and Brown, Entrepreneurial Ecosystems and Growth-Oriented Entrepreneurship, OECD LEEP Program and Dutch Ministry of Economic Affairs workshop paper, The Hague, Netherlands, Jan 2014.

FIGURE II: TECH ENTREPRENEURSHIP ECOSYSTEM FRAMEWORK



Source: OC&C analysis

## Role of the government in strengthening the tech entrepreneurship ecosystem

While many actors are involved in the ecosystem, the role of government deserves attention. Government policy can affect all entrepreneurial actors and components of the ecosystem: resource providers, entrepreneurial connectors within the ecosystem, and the entrepreneurial environment of the ecosystem. The government's contribution is important because of its direct impact on the ecosystem through the creation of favorable terms and the provision of incentives for high-growth startups. Moreover, government exerts its influence on all components to create a constructive environment and facilitate interconnectivity between these components.

In the benchmark countries, the shift to knowledge-based industries has taken place both via favorable policies that support the development of each component of the ecosystem and greater government funding for high-growth firms.<sup>6</sup> Governments have played a leading role in successfully facilitating tech entrepreneurship ecosystems through their impact on all seven components of the ecosystem.

<sup>6</sup> Global Entrepreneurship Monitor, Global Report 2016/2017

# Executive summary

## South Africa at a glance

With a GDP worth USD 294 billion, South Africa is the 40<sup>th</sup> largest economy in the world and the third largest in Africa. Gauteng Province is at the heart of economic activity, contributing approx. 35 percent to national GDP and around 42 percent to national employment.<sup>6</sup> Western Cape Province accounts for 14 percent of the GDP and Cape Town is ranked as the most entrepreneurial city in South Africa.<sup>7</sup> Income inequality remains one of the highest in the world. The PPP-adjusted average income of USD 13,000 conceals large differences in income levels and 78 percent of the population has been poor at some time.<sup>8</sup> The fact that half the population is under the age of 24 is a particular problem, given unemployment at 27%.<sup>9</sup>

South Africa's government agenda is driven by economic inclusion initiatives, with the current National Development Plan focusing heavily on raising the quality of life of the typical South African. Around 11 million new jobs are expected by 2030 and the government is committed to building the capacity of individuals and industry, as well as expanding access to basics such as healthcare, infrastructure, and transportation.

South Africa is an attractive destination within Africa for living, tourism, and conducting business, with a strong potential for attracting regional and even global talent.

## The results of tech entrepreneurship - Outputs

On measures of tech entrepreneurship outputs, South Africa ranks below many of the top performing countries, but above several of its emerging market peers.

The country's position suggests that it has good benchmarks to target better performance in all of the economic contribution indicators used in our analysis – the prevalence of tech startups in the country, the number of exits above USD 100 million, the number of 'unicorns', entrepreneurs'

growth aspirations, and the total contribution of knowledge sectors to the economy.

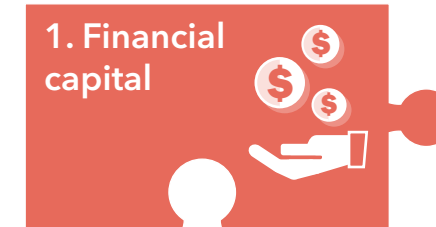
The output indicators for innovation creation – the volume of innovation generated by the country overall, and the amount of innovative products and services generated by entrepreneurs – demonstrate that South Africa outperforms many emerging market peers, yet is still significantly behind the top performers. A comparison of South Africa's output performance against the benchmark set can be found on page 20.

## South African tech entrepreneurship ecosystem overview - Inputs

South Africa's tech ecosystem is remarkable for its strong government support and the number of programs that target tech entrepreneurship. The government has also found a successful mechanism for stimulating private sector involvement: the EDS initiative, which awards points to private-sector companies that invest in their smaller suppliers. As a result, there are both public and privately funded initiatives that target job creation and increasing SME capacity through incubation, mentoring, office space, advisory, grant and other support to entrepreneurs, particularly those from previously disadvantaged groups.

Our review of the South African tech entrepreneurship ecosystem with key participants identified three major areas for improvement:

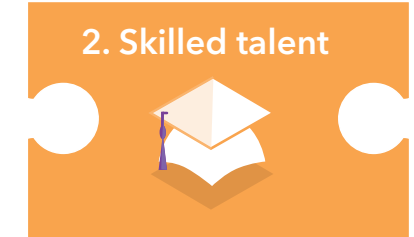
- The foundations of the education system are unable to support the development of tech entrepreneurship within South Africa on a broad scale.
- The rich network of support services offered to young companies are not yet monitored and have not yet managed to ensure maximum impact on entrepreneurs.
- Much of the support has focused on creating early-stage startups and entrepreneurs, with little focus on mapping out the full journey of entrepreneurship and creating support initiatives along the way.



Startups need a mix of funding to support their launch, growth, and scale. In South Africa, **the Gauteng funding landscape is fueled by the large amount of government spending and government-directed private sector spending**, with angels and VCs playing a minimal role. **The Western Cape ecosystem is funded by more traditionally configured VCs and angel investors**, in part due to the large number of high-net-worth individuals who reside in the area.

The sizable number of Gauteng incubators doesn't translate to similar numbers of angel and VC investments, in part due to the **relatively weak relationship between incubators and angels/VCs**. This is partly due to the fact that **VCs are generally quite risk-averse in South Africa**, which is one reason **the government created the program 12J, which gives tax relief to investors for investing in qualified Venture Capital Companies (VCCs)**. These VCCs must observe a number of restrictions related to investing in **South African startups**, such as the requirement for domestic registration of the startup and off-limit industries, including professional services (financial and management consulting) as well as alcohol, tobacco, weapons, and gambling.

While the Western Cape ecosystem resembles international systems in terms of ambition, **in the Gauteng ecosystem many entrepreneurs are not thinking about the exit options for their startups**. Instead they are focusing on building businesses that are sustainable in the long term. In addition, few startups are mature enough to IPO on **the Johannesburg Stock Exchange (JSE), which has just 3% of tech companies in its listings**. As a result, most startups exit via strategic acquisitions, though a law in place that makes cross-border IP acquisition taxable might be limiting options for startups.



**South Africa's history of uneven education means that much the population is still undereducated**, an issue with far-reaching impacts on employment, entrepreneurship capability, and overall economic development. **Tech incubators focus on upskilling would-be entrepreneurs**, in part to fill these gaps.

To combat this issue, **the government focuses on the basics of literacy and math at the primary level**. **Poor education foundations and low exposure to entrepreneurship have meant that there are few skilled developers for tech entrepreneurship**. Immigration could address this, and **the government has amended its immigration policy for highly skilled science and mathematics teachers, technicians, researchers, and graduates** with high-priority degrees. However, this may not fully counteract the 'brain drain' of 19,000 skilled professionals to OECD countries.

**Many in the ecosystem see fixing early education as the single biggest change the government could make to grow the tech ecosystem**. Ranked 137th in a survey of education systems in 139 countries, South Africa's poor education system is potentially the biggest hurdle in the ecosystem.

**Experienced developers are highly sought after, particularly in non-tech industries** that pay well, which effectively leaves many tech startups unable to hire them. Inexperienced developers by contrast, find it harder to find placements, suggesting that **an opportunity exists to raise the skills of inexperienced developers outside of the university system, by fostering a 'back office' service capability for software development** that raises the skills of existing talent and creates new employment opportunities for those with basic skills.

<sup>6</sup> "Contribution to GDP rising", Sopa 29.2.2016

<sup>7</sup> "Economic Performance Indicators for Cape Town" saoga.org.za

<sup>8</sup> World Bank. "The World Bank in South Africa: Overview", <http://www.worldbank.org/en/country/southafrica/overview> (accessed October 25)

<sup>9</sup> OC&C analysis based on Euromonitor



At the university level, the **45 publicly-funded universities teach science, engineering and technology ("SET") fields and have research centers, although the quality of education is not uniform.** University technology transfer offices (TTOs) are responsible for transforming research into market-ready innovations; yet more work needs to be done to facilitate this transformation.

The **Western Cape ecosystem seems to be better developed, with two of the three leading South African universities, a highly effective TTO, and an emerging innovation specialist capability in the life sciences.**



The **Gauteng tech entrepreneurship support system is a rich network of innovation-focused hubs, incubators, accelerators, R&D centers, and universities.** These programs mainly provide internet access, co-working space, innovation support, mentorship, training, and even stipends to budding entrepreneurs. The large number of programs may create some confusion in the market, as **overlapping initiatives may be difficult for startups to navigate, given the lack of a single portal** that centralizes all information. And while the sheer number of support initiatives is impressive, the **lack of an established assessment method means that the ultimate impact of incubators is unknown.** One area of concern is mentorship, a standard feature of innovation hubs. **Well-funded Economic Supplier Development (ESD) programs have attracted many mentors and service providers to the ecosystem, yet few truly understand the needs of entrepreneurs.**

In Gauteng, support service providers collaborate to service startups. As a result, **entrepreneurs take advantage of multiple services and this can be extended for years.**

The **ecosystem in the Western Cape more closely resembles ecosystems such as those of OECD countries, with far less government funding and more commercial angel and VC funding.** Entrepreneurs in the Western Cape maintain connections to international markets, often leveraging cultural or familial links to foreign countries such as the US, UK, and Israel.



On cultural dimensions associated with entrepreneurship, **South Africa resembles the United States, especially given a focus on individuality, merit, and opportunism.**

A preference for immediate rewards over long-term gain is in part driven by the level of poverty and dependency in the country, where the poorest households can number as many as seven members.

Despite these cultural features, **the Total Entrepreneurship Activity rate is just 6.9%, lower than its emerging market peers.**<sup>41</sup> This may be due to a low tolerance for failure, though the large number of entrepreneurs who want to make a social impact may help offset this, given a lower focus on financial returns.

**South Africa's history has led to a 'necessity driven entrepreneurship' culture,** which is now being reoriented to an innovation-driven culture. There are few role models for this new type, but there is an opportunity to actively build an entrepreneurship-supportive culture. Another cultural element to address is risk aversion, which affects both entrepreneurs and investors and might be keeping highly skilled tech talent from choosing entrepreneurship.

South African entrepreneurs, **particularly in the Gauteng ecosystem, are more likely to be lower income and require broader measures of support** to build their business. Often supporting up to seven other household members, the stipends that some incubators provide is critical to sustain these entrepreneurs but it may not be enough.



## BUSINESS PROCEDURES

Compared to its neighbors, **South Africa's business regulation is relatively straightforward, but bureaucracy may create delays and raise costs.** South Africa ranks 74th in the World Bank's Ease of Doing Business assessment, reflecting high regulatory mandates and similarly high costs of doing business for basic business procedures. In one study 40 percent of firms found government bureaucracy burdensome enough to limit business growth. The government has introduced support services, including consulting and registration support to combat this, but doesn't yet offer a central portal with all the required information.

South Africa's history of economic marginalization is being countered through **laws designed to protect workers' rights and help prevent exploitation, and via strict minimum wage and severance requirements.** But the inflexible nature of these laws makes them difficult for startups to follow, and, as a result startups, tend to delay hiring full-time employees. This runs counter to government goals for employment.

**Bankruptcy protection is available to entrepreneurs, but it can affect an entrepreneur's ability to get credit and investment for up to 10 years afterwards.**

## DIGITAL POLICIES

Digital policies are largely in line with international standards, and freedom of expression and fair competition are supported by policymakers, with freedom of expression secured in the South African Constitution and net neutrality outlined in the National Integrated ICT Policy whitepaper. Other laws related to cybercrime and data privacy are in line with international standards, though South Africa is finding ways to localize them to align them better with local needs.

Although strong IP protections exist, the lack of a centralized system to identify infringements and high costs of enforcement may prevent startups from successfully defending their rights. A dedicated court and searchable system could enhance the ability of startups to defend their IP.

## GOVERNMENT R&D POLICIES

Much funding, infrastructure development, and regulatory focus is directed at R&D, which accounts for 0.7% of South Africa's GDP. Publicly-funded R&D focuses on basic research and human capital development, while the private sector invests for product development and competitiveness.

Despite a high return and a dedicated focus by government programs and agencies to improve the interface between public and private sector R&D, **private R&D spending is low.** This trend is probably due to the same structural challenges that affect the wider business environment including political uncertainty, poor ICT and transportation infrastructure, bureaucracy, and a skills gap.

**South Africa has introduced generous R&D incentives for the private sector that can give tax relief up to 150% of qualified spending.** New controls designed to reduce application fraud have made the process so cumbersome that many companies have drastically reduced their use of the program and with it their

R&D activity. The South African government is working with the World Bank on how to streamline these procedures.

TRADING ACROSS BORDERS

South Africa’s location within Africa and links to Europe and other regions makes it ideal for testing and exporting innovations targeted at low-income populations in other African nations. Yet, cross-border transactions are highly regulated, with requirements to report all cross-border payments to the South African Reserve Bank (SARB), and register all foreign e-commerce companies for VAT.

Exchange Control Regulations and IP laws closely monitor and restrict how currency and IP can cross South Africa’s borders or be acquired by non-public entities. The Intellectual Property Rights from Publicly Financed Research and Development Act (IPR Act) requires all acquirers of publicly-funded IP to cover all R&D costs before ownership can be transferred. Within the private sector, South African IP that is acquired by foreign entities, either standalone or within a startup acquisition, must be registered as a cross-border capital exchange and approved by the SARB, which may be subject to taxation. Recent amendments have relaxed the regulations somewhat, but cross-border regulations are sufficiently tight that many startups register their IP in foreign jurisdictions.



ICT’s contribution to South Africa’s GDP was around 3 percent in 2014.<sup>47</sup> Mobile data packages are out of reach for many South Africans, and are both slower and costlier than in other BRICS countries.

South African fixed internet services infrastructure is weak and few citizens have at-home coverage. The government has set a target of 100% internet coverage in the cities. Results have been mixed: overall rollout has been slow, but a USD 10 million Cape Town project added 500 km of fiber optic network.

The low-cost nature of cloud services has made it a leapfrog technology that is attractive to South African public and private sector entities as a way to avoid the high capital requirements of building data centers. South Africa now has data centers clustered in Johannesburg and Cape Town, with international providers building dedicated sites. As much as 93% of the private sector plans to use cloud computing technology and the government intends to migrate to the technology as part of a 2017 commitment for cloud-based e-government services.



South Africa’s uneven broadband penetration - 3.2% fixed vs 58.6% mobile subscription and only 24% of households with a computer - limits penetration to B2C internet market potential. However, B2B market potential has been promoted through public and private sector procurement programs and as much as 12 percent of South Africa’s GDP is now spent on small business procurement. These initiatives have been accompanied by programs and initiatives to support startups delivering on these commitments. Yet, ‘market access’ is still seen as one of the primary challenges for tech entrepreneurs. Much of this is due to the structure of the market, where large, established companies dominate the private sector and Small, Micro, and Medium Enterprises (SMMEs) contribute just 35 percent to GDP.

South Africa’s unusual mix of culture, languages, and socio-demographics makes it well positioned to create a specialist capability for solving problems related to poverty, health, and access to products and services.

Recommendations designed to strengthen the tech entrepreneurship ecosystem

The South African government has been strongly committed to supporting entrepreneurs and innovators in the tech ecosystem with a detailed and thorough offering of resources, funding, private sector incentives, and regulatory oversight. Raising the effectiveness of existing efforts, and tailoring incentives to desired outcomes will aid the country in addressing the jobs and innovation priorities. Four areas of focus have been identified:



Details of the specific recommendations under each group can be found on page 58.

Conclusion

South Africa’s impressive progress is founded on an economic inclusion agenda that focuses on creating jobs and opportunities through innovation and entrepreneurship. The scale of this support has the potential to make South Africa an outsized contributor to global innovation, but first it must continue to improve the lives of its citizens by

expanding access to basics such as education, employment, and ICT services. Shifting the focus from the number of entrepreneurship programs to their effectiveness will ensure that impact is maximized and that the aims of the government are met.





# South Africa at a glance

South Africa is the 40th largest economy in the world, with a GDP worth USD 294 billion, and it's the third largest in Africa, after Nigeria and Egypt. Within Africa, it benefits from developed infrastructure and its economy is largely driven by natural resources such as mining of gold, diamonds, and platinum. In recent years there have been economic challenges arising from a number of issues including a nationwide drought, weak consumer demand, and political uncertainty. Taken together, GDP per capita shrunk by a modest 1% from 2014-2017.<sup>10,11</sup>

South Africa's population of 55 million has a striking amount of diversity and the country boasts 11 official languages. The average income of PPP-adjusted USD 13,000 conceals large differences in income levels and 78 percent of the population has been poor "at least once".<sup>12</sup> Income inequality remains one of the highest in the world, with a Gini coefficient of 0.69 and with the wealthiest 20% of the population responsible for more than 65% of the country's consumption.<sup>8</sup> Lower-income citizens are heavily reliant on the government

for basic income, with government transfers the main source of income for all but the top two income quintiles.<sup>11</sup> To help combat this and incentivize living wages, minimum wages will come into effect in 2018.<sup>11</sup>

The peaceful transition that marked the country's emergence from apartheid ushered in a new era of development and inclusion. Free elections, economic inclusion initiatives, and relative peace between ethnic groups has helped the country recover from its past, and currently it serves as an attractive destination within Africa for living, tourism, and conducting business. Since the 1990s, the government has been working actively to incorporate more South Africans into formal employment. This is especially critical given that half the population is under the age of 24<sup>13</sup>, and the unemployment rate is 27%.<sup>14</sup> There is evidence for successful social programs - poverty has been halved from 34% to 17% since 1996 by introducing social welfare programs. This was achieved by creating a more favorable economic environment, and expanding access to housing.<sup>12</sup>

Much of the government's development efforts relate to reversing the effects of apartheid, which included institutionalized segregation and economic inequality along racial lines. Government programs have therefore focused on giving opportunities to businesses owned or operated by members of previously disadvantaged groups, alongside traditional development goals, such as increasing economic growth, improving access to health and education, and introducing improvements to infrastructure. These policies, though restrictive at times, are expected to develop as the country evolves and matures. Moderate political instability and corruption, as well as power and wealth concentration continue to exist, albeit at lower levels, despite government attempts to stimulate development and economic growth.

High unemployment at 27 percent is the most pressing social issue.<sup>13</sup> The swelling workforce is overwhelming the number of new jobs created with 2.6 youths entering employment for every adult leaving, as indicated by a ratio of the population aged 15-19 to those aged 55-59.<sup>9</sup> In 2017, only 31,000 new jobs were created for a workforce that increased by 427,000.<sup>11</sup> The large differences between groups in access to education have also limited the ability to raise employment levels and create entrepreneurship success.

The business environment is large and varied, though a history of mining and natural resources still remains a critical part of the economy. SMMEs make up just 35% of GDP.<sup>6</sup>

The National Development Plan currently in effect focuses heavily on raising the quality of life of the typical South African, with a target of 11 million new jobs by 2030, building the capacity of individuals and industry, and expanding access to basics such as healthcare, infrastructure, and transportation.<sup>15</sup> The

government also expects to stimulate job creation by lowering the cost of doing business and raising the capabilities of the workforce to produce and commercialize innovation.

After impressive strides in the past two decades, economic growth and social improvements appear to be slowing. This suggests a shift in focus from basic development to making existing programs work better.

FIGURE 2. GLOBAL COMPETITIVENESS INDEX SCORES OF S. AFRICA

	Score (1-7)	Rank (138)
GLOBAL COMPETITIVENESS INDEX	4.5	47
INSTITUTIONS The quality of legal and administrative framework that regulates interactions between government, firms and people	4.5	40
INFRASTRUCTURE Existence of extensive and efficient infrastructure to supply required services	4.2	64
MARKET SIZE Size of the economy	4.9	30
MACROECONOMIC ENVIRONMENT Stability of the economy	4.5	79
GOODS MARKET EFFICIENCY Intensity of local competition, ease of doing business, tax rates, imports ratio and buyer sophistication in a country	4.8	28

FIGURE 1. MACROECONOMIC INDICATORS FOR SOUTH AFRICA

	Value	Rank (192)		Percentage
GDP (USD), 2016	294 B	39	SME contribution to GDP, 2014	36%
GDP per capita (PPP adj. USD), 2016	13 K	89	Consumer expenditure as a % of GDP, 2016	60%
Population (millions), 2016	55	25	Stock market cap as a % of GDP, 2015	323%
Rate of population aged 15-19 over those aged 55-59, 2016	2.60		Stock market traded as a % of GDP, 2015	137%

Source: IMF, World Bank, Global Entrepreneurship Monitor, Euromonitor, AT Kearney, Economist, World Economic Forum

<sup>10</sup> International Monetary Fund. "World Economic Outlook October 2017". <https://www.imf.org/external/pubs/ft/weo/2017/02/weodata/index.aspx> (accessed November 9, 2017)  
<sup>11</sup> OECD Economic Surveys: South Africa. July 2017  
<sup>12</sup> World Bank. "South Africa Economic Update: Innovation for Productivity and Inclusiveness". September 2017  
<sup>13</sup> Global Entrepreneurship and Development Institute. "The entrepreneurial ecosystem of South Africa: A strategy for global leadership."  
<sup>14</sup> World Bank Dataset. Unemployment, total (% of total labor force) (modeled ILO)

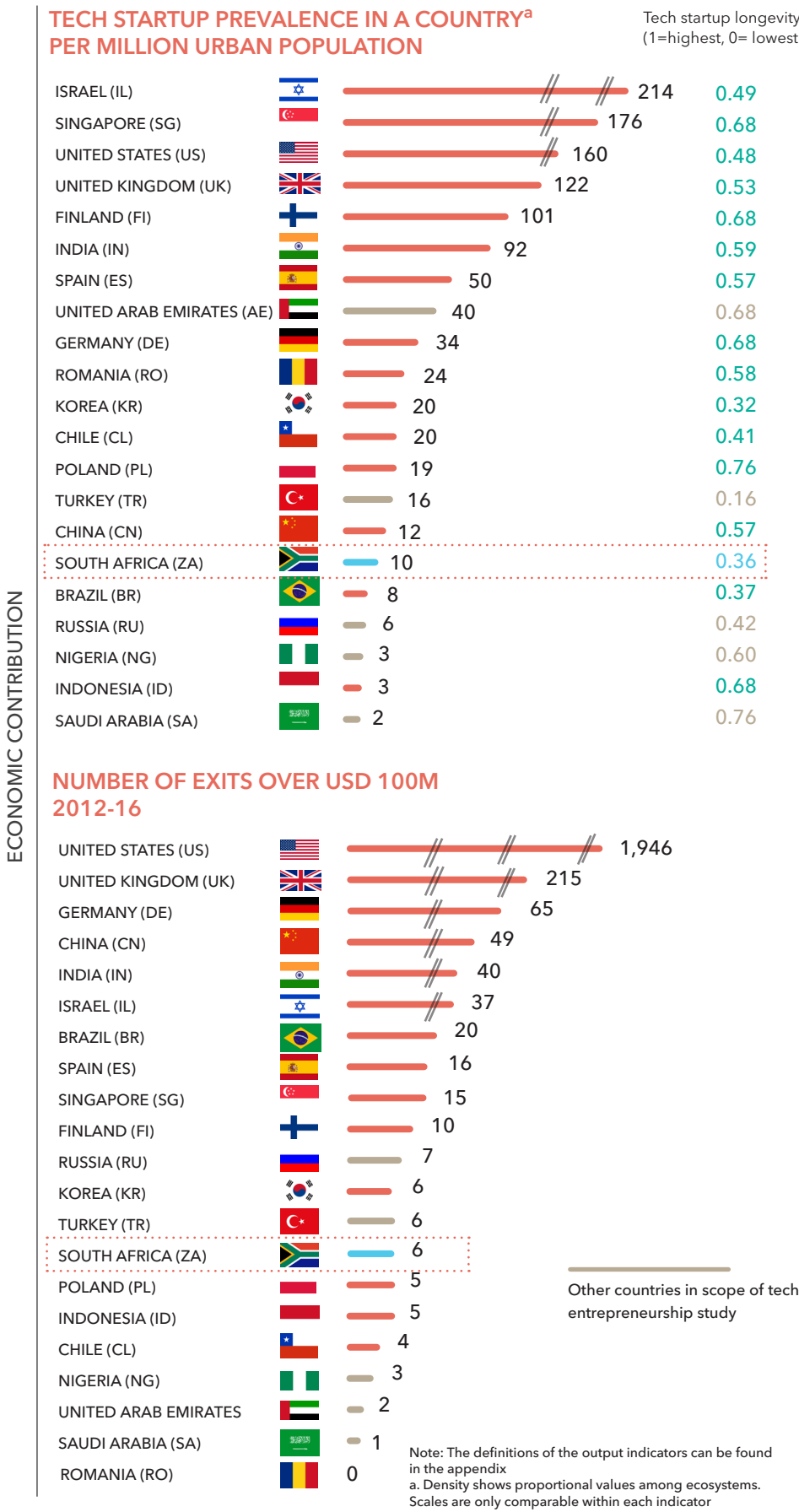
<sup>15</sup> Endcode. "Legal and Policy Landscape Impacting Entrepreneurship and Tech Entrepreneurship in South Africa". October 2017



# The results of tech entrepreneurship – Outputs

On measures of tech entrepreneurship outputs, South Africa ranks below many of the top performing countries, but above several of its emerging market peers. The country’s position suggests that it has good benchmarks to target for better performance in all of the economic contribution indicators used in our analysis – the prevalence of tech startups in the country, the number of exits above USD 100 million, the number of ‘unicorns’, entrepreneurs’ growth aspirations, and the total contribution of knowledge sectors to the economy. The output indicators for innovation creation – the volume of innovation generated by the country overall, and the amount of innovative products and services generated by entrepreneurs – demonstrate that South Africa outperforms many of its emerging market peers, yet it still has a way to go to match the top performers.

# South Africa vs. benchmark countries

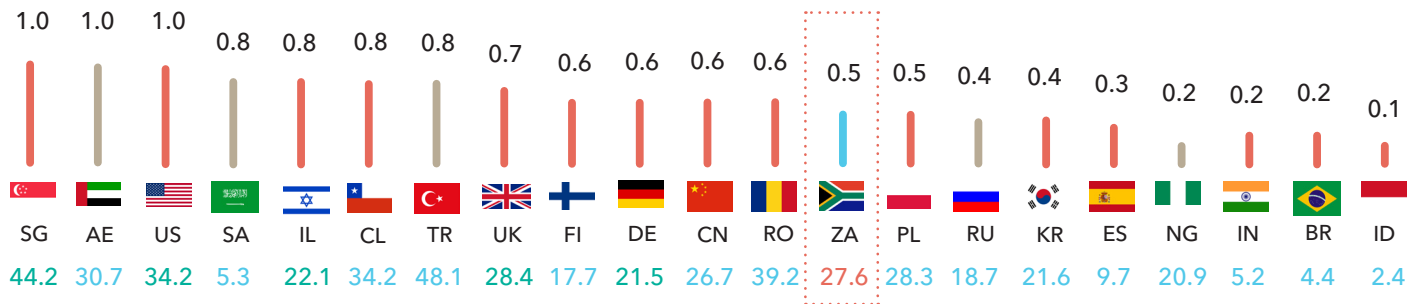






ENTREPRENEUR'S GROWTH ASPIRATION SCORE<sup>b</sup>

A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding (1=highest, 0=lowest)



HIGH JOB CREATION EXPECTATION (% OF ENTREPRENEURS)

Other countries in scope of tech entrepreneurship study

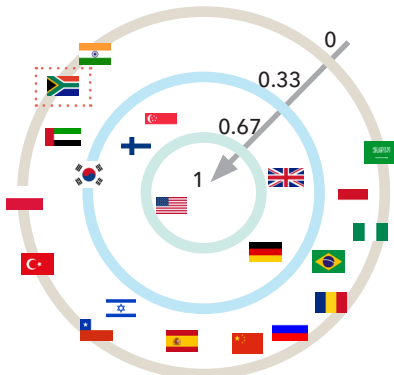
ABILITY TO CREATE GLOBALLY RECOGNIZED "UNICORNS"<sup>c</sup>

Technology start-ups with over USD 1 billion valuation in benchmark countries



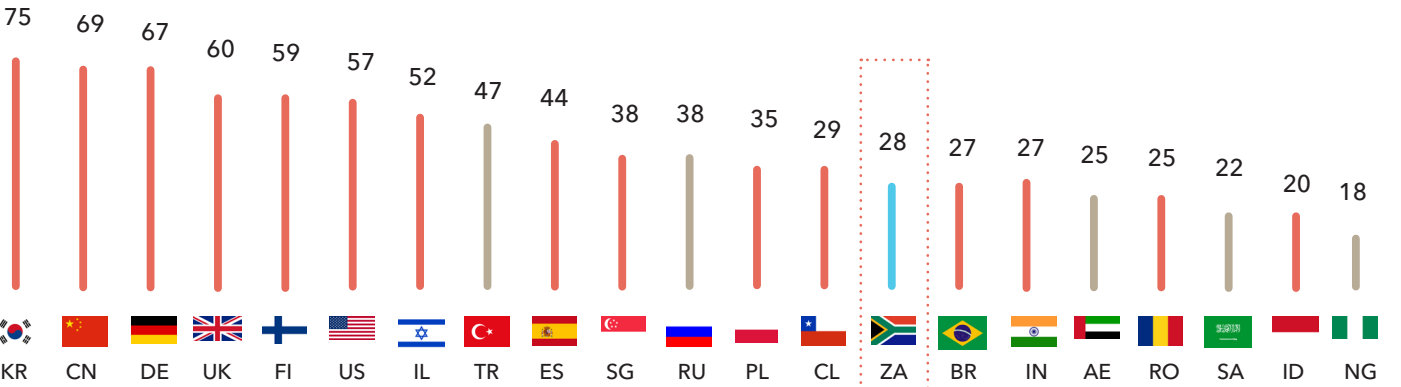
CONTRIBUTION OF KNOWLEDGE SECTORS TO THE ECONOMY

ICT & High-tech exports, international data flows and IP receipts (1=highest, 0=lowest)



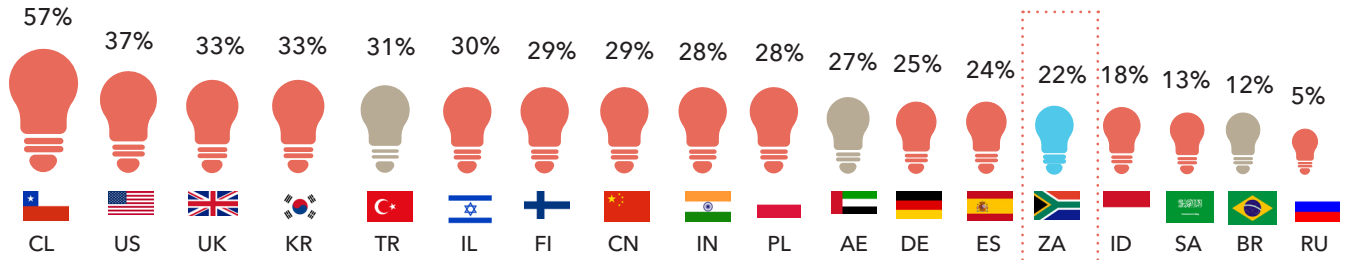
INNOVATIVE OUTPUT DENSITY

The abundance of knowledge creation and intangible assets in a country (out of 100)



ENTREPRENEURIAL INNOVATION CREATION<sup>d</sup>

Rate of entrepreneurs involved in new product or service creation



Note: The definitions of the output indicators can be found in the appendix  
b. A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding  
c. Unicorns in tech-related categories are taken into consideration

Note: The definitions of the output indicators can be found in the appendix  
d. Some benchmark set countries are not shown due to data availability  
Source: OC&C analysis based on World Bank, GEM, GEDI, Crunchbase, INSEAD, McKinsey, CB Insights



# South Africa tech entrepreneurship ecosystem

The South African startup ecosystem is one of the most vibrant in Africa, producing a number of innovative companies and serving as a destination for entrepreneurs who want to start their own ventures. Given the need to reduce unemployment and inequality through wealth creation, the government has recognized the important role that startups and SMMEs can play, and has developed a sophisticated infrastructure around these companies. At 35%, SMMEs make up a particularly low proportion of the economy for an economy of South Africa's size, and this number may be declining.<sup>8</sup> This is a problem for job creation, as their link to reducing unemployment and income inequality is strong.<sup>12</sup>

In South Africa, two types of tech entrepreneurship ecosystems operate, each with its unique players, drivers, and market focus. The Johannesburg/Pretoria ecosystem in Gauteng Province is run by government investment as well as private sector funds directed toward entrepreneurship as part of government programs. Johannesburg's status as an entrepreneurship hub is gaining international prominence and the city was home to 180 startup events in 2016. It also hosted the prestigious Global Entrepreneurship Congress 2017.<sup>12</sup> Pretoria's location as one of the seats of government is key to this status, which is why it is at the center of the country's efforts for economic development via entrepreneurship.

At the other end of the country the Western Cape is home to the thriving Cape Town and Stellenbosch ecosystems, both known for their innovation focus and more international ambitions. The Cape Town ecosystem is by some calculations twice the size of the Gauteng ecosystem.<sup>12</sup> The funding landscape in the Western Cape more closely resembles that of more mature ecosystems, made up of angel investors, family offices, and venture capitalists rather than government funding.

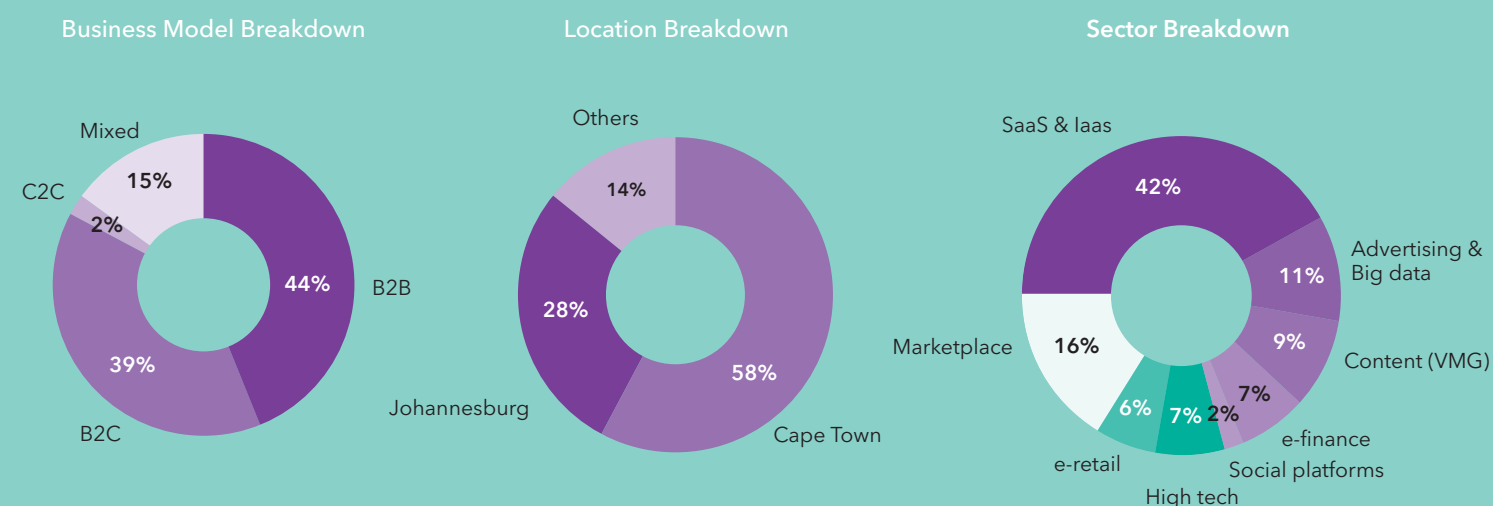
Given the strong government involvement in the Gauteng ecosystem, the ecosystem in this province is more closely examined. While the Cape Town ecosystem has a larger projected number of startups, it functions largely independently and is less reliant on the government.

The South African government's mandates to improve the economy include raising employment levels, increasing its debt rating, and strengthening governance. Alongside this, the government is also focused on the economic inclusion of previously disadvantaged groups. Two related initiatives – the Black Economic Empowerment (BEE) and Economic Supplier Development (ESD) programs – are key to this agenda. Though not exclusively directed at the tech and innovation sectors, these programs have triggered significant improvements in the Gauteng tech startup ecosystem.

Black Economic Empowerment has been a powerful initiative that is shaping the economy as well as the private and public sectors. As a program designed to promote economic inclusion, it functions as a point-based system to allocate preference for government tenders to companies that are owned or managed by South Africans from previously disadvantaged groups (referred to as "black", though not necessarily of African heritage). Perhaps no other program has had as large an impact on the growth and shape of South African industry. However, the broad approach used to allocate points and give preference may be further improved to redistribute wealth to the most economically disadvantaged South Africans.

Similarly, the Enterprise and Supplier Development (ESD) program creates incentives for established companies to invest in the training and development of their smaller supply chain participants, either directly or indirectly via ESD providers. Large companies must spend 3 percent of annual profits on suppliers included in the program. This program is the largest driver of funding for the country's large number of innovation hubs and incubators, unlocking ZAR 12 billion (USD 900 million) in capital for companies to fund empowerment initiatives.<sup>16</sup>

FIGURE 3. PROFILE OF TOP 100 TECH STARTUPS IN THE SOUTH AFRICAN ECOSYSTEM



VMG: Video, Music, Games  
Source: OC&C analysis based on Crunchbase

<sup>16</sup> "First National Bank, Endeavor South Africa. "The Entrepreneurial Dialogues: State of Entrepreneurship in South Africa". <http://sablennetwork.com/pdf/The%20Entrepreneurial%20Dialogues%20-%20State%20of%20Entrepreneurship%20in%20South%20Africa.pdf> (accessed October 26, 2017)

FIGURE 4. BLACK ECONOMIC EMPOWERMENT ACT OF SOUTH AFRICA

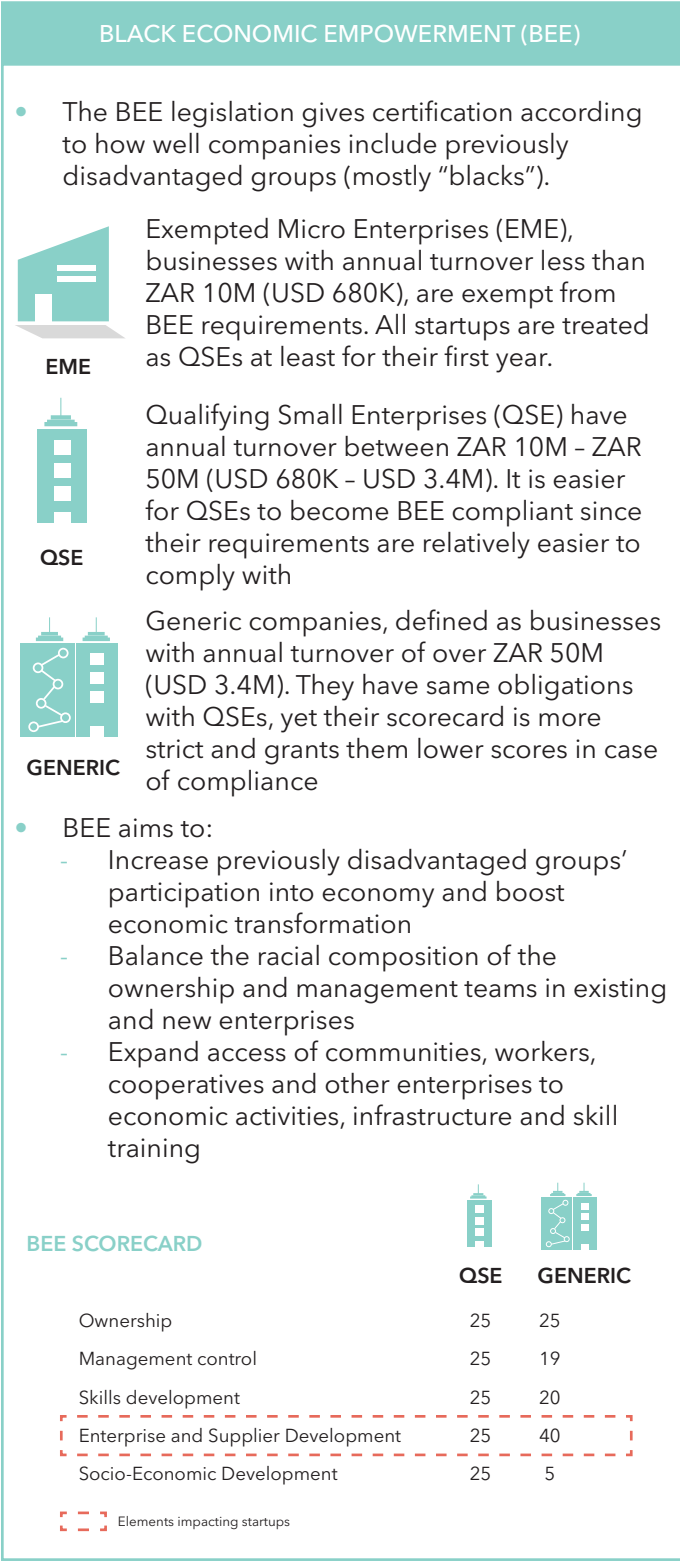











FIGURE 6. THE INNOVATION AND TECHNOLOGY FUNDING INSTRUMENTS OF SOUTH AFRICA

<div> Department of Science and Technology</div>				<div> Department of Trade and Industry</div>				<div> Industrial Development Corporation</div>		<div> Department of Small Business Development</div>	
<div> Technology Innovation Agency</div>		<div> National Research Foundation</div>		<div> Small Enterprise Development Agency</div>							
Program	Support	Program	Support	Program	Support	Program	Support	Program	Support	Program	Support
Seed Fund	ZAR 100K-500K (USD 6.8K-34K) for 12 months	Technology and Human Resources for Industry Programme (THRIP)	50-50 cost sharing up to ZAR 8M (USD 544K) per year	Support Programme for Industrial Innovation (SPII)	<b>Development:</b> max ZAR 2M (USD 136K) <b>Matching:</b> max ZAR 5M (USD 340K) <b>Partnership:</b> min ZAR 10M (USD 680K)	Seda Technology Program (STP) - Incubation	Depending on incubation, centers and business plan	IDC Development Funds	ZAR 1M-50M (USD 68K-3.4M) per project	Enterprise Incubation Programme (EIP)	ZAR 5M-10M (USD 340K-680K) funding and ZAR 1.5M (USD 102K) for feasibility studies
Technology Development Fund	ZAR 500K-50M (USD 34K-3.4M) for 1-10 years			Manufacturing Competitiveness Enhancement Programme (MCEP)	Total budget of ZAR 5.8M (USD 394K) over 3-year period	Seda Technology Program (STP) - Quality Standards and Technology Transfer Fund	Max ZAR 600K (USD 40.8K)	Technology Venture Capital (TVC) Fund	Total fund size is ZAR 130M (USD 8.8M)		
Commercialization Support Fund	ZAR 500K-50M (USD 34K-3.4M) for 3-5 years			Strategic Partnership Programme (SPP)	Grant of max ZAR 15M (USD 1M) over 3-year period and cost sharing up to 50%						

Source: Department of Trade and Industry, OC&C analysis

GOVERNMENT INNOVATION FUNDING AND OVERSIGHT:

The Department of Science and Technology (DST) is focused on South Africa’s capacity to conduct R&D:

- The Technology Innovation Agency (TIA) underwrites innovations from the proof-of-concept stage through to prototyping and commercialization.
- The National Research Foundation funds infrastructure and human skilled talent in the R&D sector.
- The Council for Scientific Research (CSIR) conducts research and development on behalf of the private sector, including startups.

- The Department of Trade and Industry (DTI) funds supplier training and programs, including SEDA and the SEDA Technology Program.
- The Industrial Development Corporation (IDC), and the Technology Venture Capital arm provide ZAR 1 million to ZAR 15 million (USD 68,000-1 million) in seed capital for innovative processes and technologies.
- The National Intellectual Property Office (NIPMO) oversees the governance of intellectual property regulation, and provides support and assistance for those affected.

SMALL BUSINESS SUPPORT:

The Department of Small Business Development and the Enterprise Incubation Programmes enable small companies to supply local markets, through physical incubation and training.

The National Treasury’s Jobs Fund, which is designed to support employment growth, allocates funds to companies that contribute to job creation. To date has supported 70,000 new jobs.<sup>12</sup>



In our review of the South African tech entrepreneur ecosystem, three areas were identified as sources of particular challenge to tech entrepreneurs:

**The foundations of the education system are unable to support development of tech entrepreneurship within South Africa on a broad scale**

The South African government's ambitions to develop innovation capabilities are held back by the poor educational foundations of the education system. The basic building blocks of education, including reading and math, are critically underperforming. This presents significant challenges to the wider ambitions for tech entrepreneurship, given that tech entrepreneurship requires not just strong STEM skills, but also good critical thinking and complex problem solving skills.

South Africa's history of under-education has left a legacy that has proven difficult to reverse. Educational performance has generational effects and the dedicated investment the government has made to expand access to the very poor will take decades to fully take effect. A lack of training resources for teachers presents another problem – educators in the most rural and poor areas are themselves underskilled and underequipped to deliver high-quality education.

Gaps in the education system create knock-on effects for tech entrepreneurship. Expanding university access and creating university programs targeting innovation and entrepreneurship are not enough to overcome the early disadvantages of the education system. Similarly, special services targeted at new entrepreneurs within innovation hubs and incubators still require that entrepreneurs have an adequate educational background.

This issue must be systematically addressed for South Africans to have access to the opportunities that tech entrepreneurship affords, and for the country to realize the economic benefits that entrepreneurship offers.



**The rich network of support services offered to young companies are not yet monitored and managed to ensure maximum impact on entrepreneurs**

Between direct government grants and EDS funding, a great deal of support exists for early-stage companies in the form of funding, innovation hubs, incubators, training programs, mentors, and other specialized support. However, to date, little of this is given or monitored on the basis of impact or effectiveness. The result is twofold: it is unknown which programs deliver the biggest impact, and the ecosystem is unable to share best practices across programs. This risks the government spending money without understanding how much to allocate, as well as who should be the target entrepreneurs who will deliver the best results.

A monitoring program that identifies best practices and sets benchmarks could create the kind of performance-driven programs that better align resources with beneficiaries, and maximize impact and effectiveness.

**Much of the support has focused on creating early-stage startups and entrepreneurs, with little focus on mapping out the full journey of entrepreneurship and creating support initiatives along the way**

The Gauteng ecosystem is marked by tremendous amount of resources for new entrepreneurs, focusing on the ideation and launch phases. For those entrepreneurs who go beyond the early stage of development, however, less support exists to ensure that ventures can compete effectively in the market. In particular, there is a gap related to follow-on investment from professional investors such as experienced angel investors and venture capital firms. One reason is the risk-averse nature of existing VC firms, considering the nascent stage of the tech entrepreneurship ecosystem.

The government has begun to address this issue via tax exemptions for investors that invest in the dedicated venture capital firms that fit a set of requirements (Venture Capital Companies, VCCs) and invest in young companies that qualify.

So far, this hasn't unlocked the capital that the investor community needs to properly support scaling companies. Instead, entrepreneurs with good personal networks and educational backgrounds may have a demonstrated advantage over those entrepreneurs with innovative ideas but few good connections.

Addressing this issue will require the government to map out the entrepreneurial journey from idea through to scaling and exit, to understand the exact needs of entrepreneurs and how the government can support directly or facilitate help from the private sector.



# Insights into ecosystem components



Successful tech startups require adequate and timely funding. Different sources of capital tailored to the startups' need accompanied by guidance and support is required for healthy growth.

There are five main sources of equity finance available for entrepreneurs:

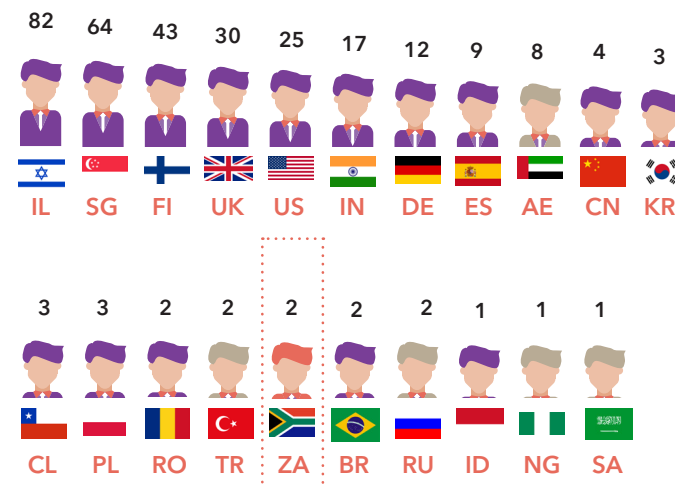
- **Individual investors** (personal networks, angel investors, crowdfunding) – at the seed stage
- **Venture capital** – (institutional investment), from seed to later stages with high return expectations
- **Public funding** (grants, sovereign investment funds, funds of funds) – to fill funding gaps at various stages and stimulate priority sectors
- **Corporate investment** (strategic acquisitions, direct investment and via corporate venture funds [CVCs]) – to acquire industry-specific solutions, or for corporate innovation exposure
- **Initial Public Offerings** (IPOs) – in the local and foreign stock exchanges that also signal success to wider audience.

Though the same funding options exist in South Africa as elsewhere, strong variations make the Gauteng ecosystem unique. The private equity market is quite vibrant in South Africa, but venture capital firms are less active and over 50 percent of the startups in the country are bootstrapped (self-funded) by entrepreneurs.<sup>19</sup> Angel investors, venture capitalists, and corporate venture funds exist in limited numbers, and with limited impact. South Africa's total VC investment in 2015 was ZAR 146.3 million (USD 10 million), of which 26 percent went to software and 10 percent to e-commerce businesses.<sup>20</sup>

In Gauteng, government and government-mandated sources put direct funding from both public and private sources into innovation hubs, innovation grants, and direct investment. Corporate funding is also going into corporate investment-backed venture funding or corporate-branded innovation hubs.

The exit profile for many South African firms is also unique. Because the ecosystem is still nascent, few exits have demonstrated the potential for value creation. Most startups are run as going concerns, or are sold in a strategic acquisition. The Johannesburg Stock Exchange (JSE) is one of the largest in Africa and since 2012 it has represented 42 percent of all IPO capital raised, at USD 2.7 billion<sup>21</sup> However, a very small proportion is made up of tech listings.

FIGURE 7. NUMBER OF INVESTORS PER MILLION URBAN POPULATION



Other countries in scope of tech entrepreneurship study

Note: Figure shows number of investors per million urban population in each country  
Source: Startup Bootcamp, Crunchbase, OC&C analysis

<sup>19</sup> PWC South Africa. Working together, moving forward: Emerging companies and the ecosystem. <https://www.pwc.co.za/en/assets/pdf/emerging-companies-and-the-ecosystem.pdf>

<sup>20</sup> Morris, Eythan. "South African Entrepreneurship" Helen Suzman Foundation. March 26, 2014. <http://hsf.org.za/resource-centre/hsf-briefs/south-african-entrepreneurship>

<sup>21</sup> PWC South Africa. "2016 Africa Capital Markets Watch". February 2017. <https://www.pwc.co.za/en/assets/pdf/africa-capital-markets-watch-2016.pdf>



- **Grant funding** – Government grants directly or indirectly (e.g. via innovation hubs) form the bulk of funding going into the Gauteng ecosystem. Despite high numbers of grants being distributed across many programs, a streamlined process for startups to obtain funding would probably help ease the process for getting funding.
- **Angel investment** – Angel investment is largely absent from the Gauteng ecosystem, through more present in the Western Cape ecosystem, and what investment there is typically happens via the personal networks of the entrepreneur. This is beginning to change, as angel investment groups such as Jozi Angels and South Africa Business Angels were formed and are growing, focusing on investor education and improving deal flow.
- **Venture Capital Funding** – VC funding is helped by the 12J Venture Capital Companies (VCC) government program that allows angel investors to deduct venture capital investments from their taxable income. Private, independent VC firms are limited in number and impact, but this is beginning to change.
- **Corporate funding** – The large number of corporates funding innovation typically support innovation hubs that offer incubation and acceleration programs or to a lesser degree existing VC funds. Few corporate venture capital (CVC) funds operate, and few corporates directly invest into startups prior to the acquisition stage.
- **Alternative investments** – Alternative funding sources such as crowdfunding and initial coin offerings are largely absent from the ecosystem.

Due to the risk profile of tech startups, few qualify for debt funding, though many programs exist for small businesses that meet the requirements.



The Western Cape and Gauteng ecosystems differ considerably in terms of their funding landscape, and the source of funds that fuel the ecosystem

- In the Gauteng ecosystem, the large amount of government grants and private sector grants and investment from government-directed ESD programs form the bulk of early-stage funding. Independent and commercial VCs and angel groups are just beginning to emerge to fund the next stage of growth for startups. Innovative companies also benefit from the option of receiving large grant or equity funding from one of several government funds aimed at stimulating research directly, such as the Technology Innovation Agency's Technology Development Fund or Seed Fund.
- The Western Cape ecosystem investor landscape reflects its proximity to the large number of prominent families that reside in and near Cape Town and Stellenbosch. Wealthy individuals and family offices are the limited partners of venture capital companies, and startups typically fundraise via social networks and personal connections.
- These differences in investor focus may also be reflected in the different amounts raised by startups. Johannesburg startups typically raise an estimated USD 10,400 in seed funding, while Cape Town startups secure almost double that amount at about USD 20,100 on average.<sup>22</sup>

Angels and VCs don't have deep relationships with the large number of incubators and operate largely outside of the incubator sector

- The innovation hubs that form the bulk of Gauteng ecosystem investment are typically aimed at early-stage ventures, going-concern startups, and first-time entrepreneurs. The next step for many ventures would be securing angel and institutional funding, but this is happening less than it should for the ecosystem to be viable.

- The corporate and public sector funding that goes into supporting early-stage entrepreneurship is neither at the right level nor sizable enough to fill any gaps related to VC funding.
- One reason for the difficulty is that few incubators and innovation hubs have deep relationships with angels and VCs, instead viewing them with a measure of suspicion. This may create friction or differences in expectations that fail to prepare entrepreneurs for the realities of investor funding.

VCs are risk-averse, given a low number of significant exits and their limited access to large sources of funding

- In part due to the startup ecosystem's lack of maturity, VCs that exist are known for being particularly risk-averse. As a result, truly innovative ideas can struggle to find follow-on funding.
- A government program aimed at this gap is the VCCs/12J initiative, which gives tax breaks for wealthy individuals who invest in venture capital funds. If held for five years, qualified investments can relieve investors of up to 41 percent tax benefit. The vehicles have started to attract funding, which may eventually trigger investment growth.<sup>23</sup> However, the restrictions and requirements on these programs mean they are not attractive to everyone, particularly given the directives and exclusions they mandate for startups that can receive investment. The restrictions include no foreign companies or those which operate in the professional services, alcohol, tobacco, weapons, or gambling businesses.
- Despite the large number of startups in early entrepreneurship programs and a funding gap, the venture capital industry still struggles to find viable companies to invest in. This gap between requirements and the supply of available deals is one area that the government could focus on to improve success of the tech ecosystem.

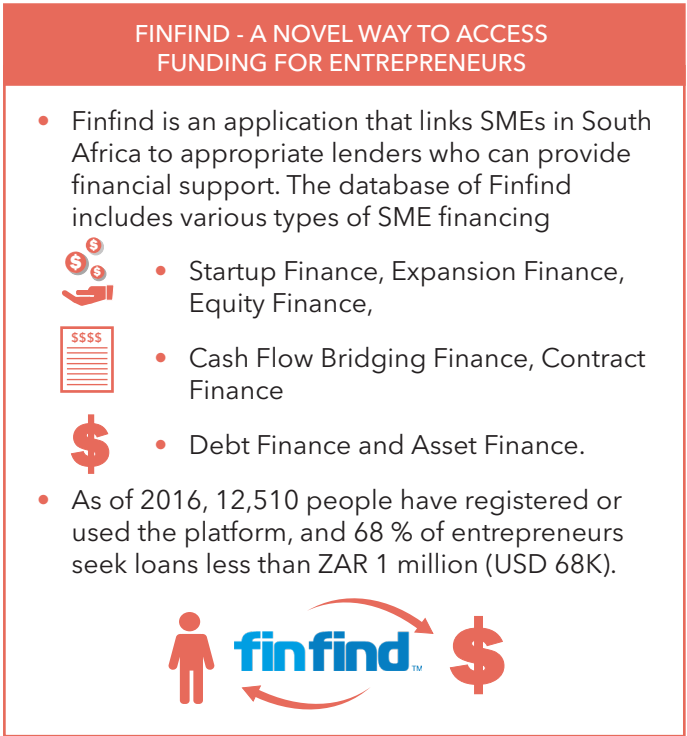
Many entrepreneurs view startups as a going-concern and employment/income generator, but are not looking for exit strategies. Those that do exit typically choose a strategic acquisition, due to low maturity in the ecosystem suitable for IPOs

- The majority of tech startups funded by the Gauteng innovation hubs and incubators are founded as going concerns, with few entrepreneurs developing exit plans that would lead to IPOs or trade sales. This is in line with government programs to drive employment and job creation.

Given the early nature of the tech startup ecosystem, few startups have reached the maturity or stability needed to IPO on the Johannesburg Stock Exchange, only 3% of which is made up of tech companies.<sup>24</sup> Though the JSE is the 19th biggest stock exchange in the world, most is controlled by traditional industries such as finance and the minerals/natural resources industries that have fueled South Africa's economy since its founding.<sup>25</sup>

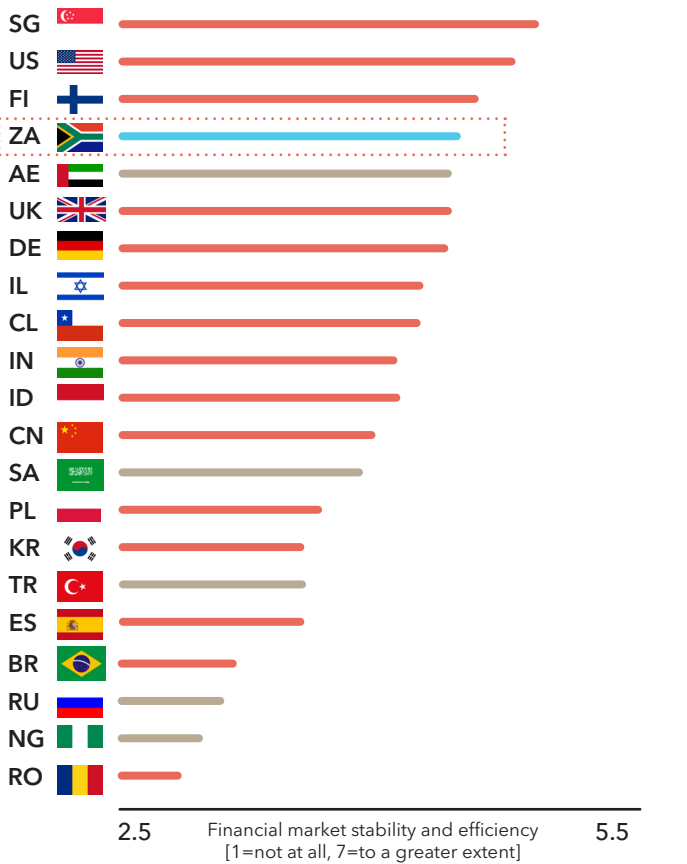
- Those startups that do exit are usually bought in strategic acquisitions, though the early nature of the tech ecosystem means that few innovations are ready for acquisition by companies at this stage.
- The law that renders IP taxable if acquired by a foreign entity may also limit exit options for many entrepreneurs, who might otherwise attract foreign interest. Mitigating this risk often involves an entrepreneur registering the company outside South Africa to free it from the exchange control obligations it might otherwise have.

FIGURE 8. FINFIND - A PORTAL FOR STARTUPS SEEKING CAPITAL



Source: Finfind, SME South Africa

FIGURE 9. FINANCIAL MARKET DEVELOPMENT IN SELECTED COUNTRIES



Other countries in scope of tech entrepreneurship study

Note: This metric shows the combination of "Soundness of the banks", "Regulation of securities exchanges", and "Legal rights index" scores of countries  
Source: World Economic Forum

<sup>22</sup> PWC South Africa. Working together, moving forward: Emerging companies and the ecosystem. <https://www.pwc.co.za/en/assets/pdf/emerging-companies-and-the-ecosystem.pdf>

<sup>23</sup> Grovest. "What is Section 12J". Grovest.com. <http://www.grovest.co.za/what-is-section-12j/>

<sup>24</sup> African Markets. "Johannesburg Stock Exchange (JSE) - Listed Companies". <https://www.african-markets.com/en/stock-markets/jse/listed-companies>

<sup>25</sup> SA Shares. "JSE Top 40". <https://www.sashares.co.za/jse-top-40/> (accessed November 23, 2017)



## 2. Skilled talent

A healthy tech ecosystem relies on a large pool of qualified potential tech founders and employees with superior skills in both technology and business. This, in turn, relies on strong STEM educational foundations and the ability to acquire the relevant business skills. While some skills can be taught in formal education, others must be learned via employment or experience, requiring the private sector's participation to provide training.

South Africa's history of uneven education means that much of the population is still undereducated, an issue with far-reaching impacts on employment, entrepreneurship capability and overall economic development. Though improving, the education system is not yet able to equip underprivileged entrepreneurs for the skills that tech startups need. Yet, within the many government-supported incubators, tech skills are being taught with the aim of everyone becoming an entrepreneur. This may overlook the benefits of specialized skills training that make the workforce more employable overall, for both large and small companies.

Because the needs of the education system are so high, the central government has focused on raising the level of basic education and expanding access to all income levels and groups. This may have come at the expense of the kinds of innovation and creativity focused interventions that would otherwise drive tech entrepreneurship capabilities.<sup>13</sup>

Foundational skills in math and language are the priority, and shifting teaching methods demonstrate that the government is still investigating the best method for students to learn the basics and raise the overall level of education. Eventually, entrepreneurship could also be taught directly in schools for young students, particularly those from disadvantaged backgrounds who are particularly vulnerable to unemployment.

South Africa has 45 universities, all of which are funded by the central government, teach basic "SET" fields of chemistry, physics, and mathematics, and have research programs. Despite this, top quality research is an issue, with only nine university R&D programs well ranked, all of which were well resourced going back to the apartheid era. The expensive laboratories, instruments, and database access required makes research costly, and the limited results raises questions about the return on investments made in this area.<sup>26</sup>

Software development is relatively new in South Africa, and the ecosystem has yet to establish true proficiency or specialization. However, several aspects work in favor of the development trajectory, such as the relatively more developed infrastructure and coverage, English as a national language, and the ability to draw foreign skilled talent from neighboring countries to South Africa.

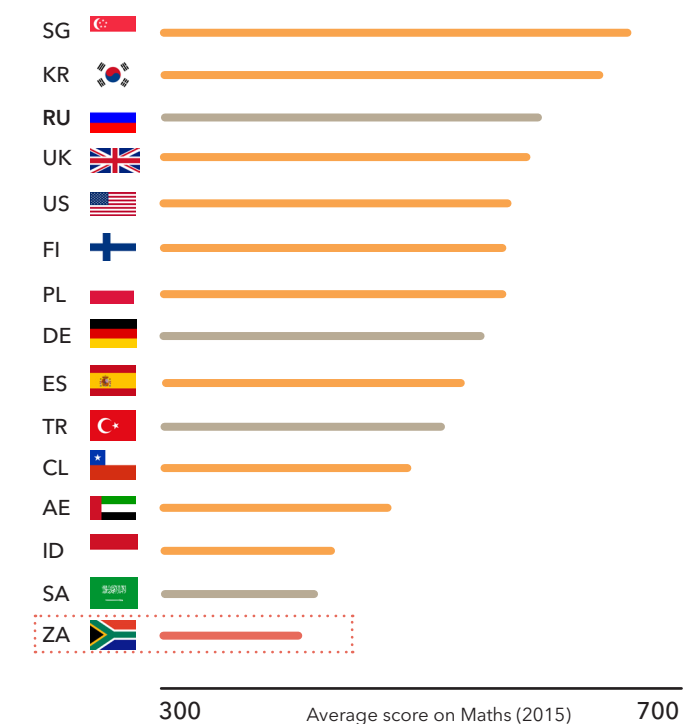
Multiple sources cite foundational education as the single biggest investment the government could make to drive the tech ecosystem

- South Africa's education scores and rankings are low, particularly for a country of its size and development and even against its peers in other parts of Africa. In one World Economic Forum survey South African students were ranked last among 139 countries for math and science, and 137<sup>th</sup> for the overall quality of its education system.<sup>27</sup>
- As a critical first step, many in the ecosystem believe that continued focus on raising the level of basic education will aid the nation's ambitions to improve its innovation capabilities.

Focusing efforts to develop South Africa as a specialized hub for back office / web development may help concentrate training public efforts and create a scalable source of employment in basic web development

- Given South Africa's uneven education history and recent focus on technology skills, skilled software developers are highly in demand in the country. ICT-related skills are the most sought-after in South Africa, making up nine of the top ten desirable skills.<sup>11</sup> This is especially true in sectors such as finance, which offers high salaries that startups are rarely able to match.
- Developers that do take jobs with startups are often lured away by higher salaries and more stable employment at larger firms, particularly if the developer is from a previously disadvantaged group, given the points system of Black Economic Empowerment (BEE).
- South African software developers command higher salaries relative to their counterparts in other markets. The South African software developer salary is USD 20,090 on average, whereas Indian developer average salary is USD 6,052.<sup>12</sup>
- Lower-skilled software developers, in contrast, find it difficult to get steady employment, suggesting a quality gap between the training programs that non-university training programs offer and the needs of tech -based employers.
- An opportunity exists to raise the skills of existing developers outside of the university system, by fostering a 'back office' service capability for software development that raises the skills of existing talent and creates new employment opportunities for those with basic skills.

FIGURE 10. TIMSS MATH SCORES FOR 10-YEAR-OLDS



Other countries in scope of tech entrepreneurship study

Source: World Economic Forum

<sup>26</sup> The Conversation. "How the funding of science research in South Africa can be overhauled". <http://theconversation.com/how-the-funding-of-science-research-in-south-africa-can-be-overhauled-65272> (accessed November 8, 2017)

Developers are in such demand at the moment, largely due to thousands of vacancies in corporate South Africa. This has drastically affected their salaries, sometimes attracting more than double “market rates”. Scaling high-quality tech teams is moving out of reach of all but very well-funded startups or startups with a developer as one of the founders. Considering these skills are the secret sauce to the modern economy - this supply/demand bubble can affect innovation negatively - **Andy Hadfield - Forgood**

Universities have established a priority in STEM degrees and research, both of which are offered at every South African university

- Training for innovation typically happens in universities, which have focused on driving the number of STEM degree holders but struggle to create market-ready innovations.
- While this has increased the number of graduates with STEM degrees, many still lack the desire or readiness to become tech entrepreneurs or tech startup employees.
- University technology transfer offices (TTOs) address commercialization of research and innovation, but more work is needed to make innovations market-ready and suitable to meet customer and investor demand.

Filling skill gaps can be accomplished through immigration policy reforms passed in 2017, which will ease restrictions on the most desirable talent

- The Department of Home Affairs’ changes to immigration policy, published in March 2017, are designed to fill skill gaps by attracting much-needed foreign talent.
- The new immigration policy should attract highly skilled science and mathematics teachers, technicians, researchers and graduates with high-priority degrees.<sup>28</sup> The laws are also designed to attract foreign investors.<sup>12</sup>
- These changes will probably still leave a skills gap, given the unbalanced nature of immigration to and from the country. In 2015 19,000 professionals, many with good business and IT skills, left South Africa for OECD countries. Compared to this, immigration into the country by skilled professionals, came mainly from neighboring, BRICS, and Scandinavian countries.<sup>12</sup>

<sup>28</sup> Department: The Presidency. “National Development Plan”. <https://www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf>

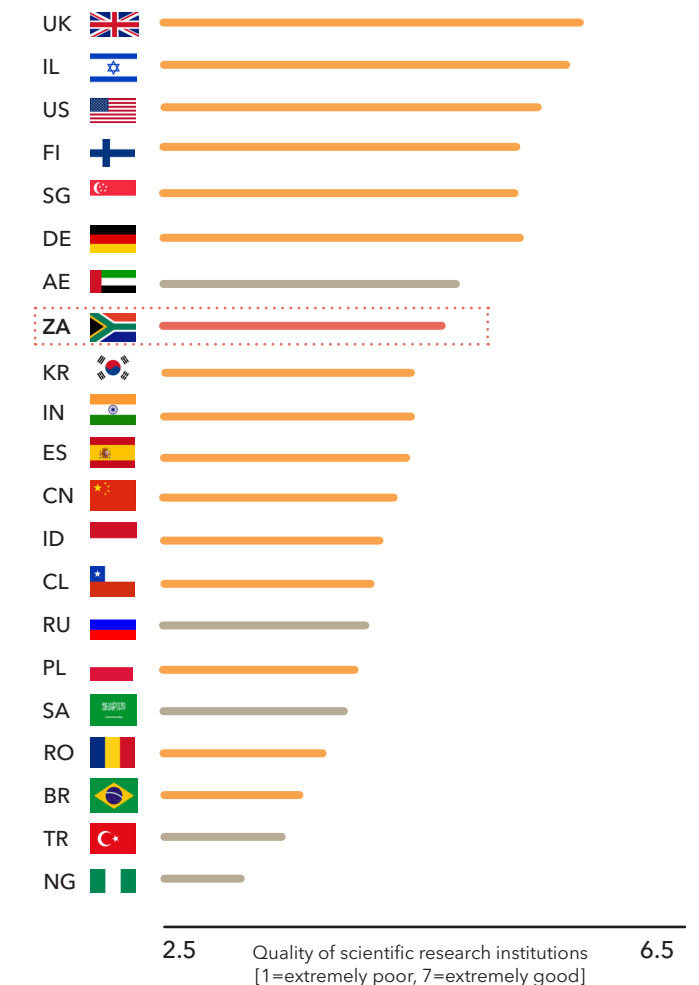
The Western Cape ecosystem benefits from some of the country’s leading universities and their TTOs, creating an innovation ecosystem configured for commercialization

- The Western Cape is home to two of South Africa’s top three universities, the University of Cape Town and Stellenbosch University, which rank 14<sup>th</sup> and 35<sup>th</sup> among BRICS universities, respectively.<sup>29</sup> Their technical facilities and ability to generate high-quality tech talent make them the anchor institutions for the Western Cape tech ecosystem.
- The region has also developed a specialization in life sciences, given the large number of students with medical and engineering training. This makes the region attractive to global healthcare companies.<sup>30</sup>

<sup>29</sup> Top Universities. “Top 10 Universities in South Africa 2016”. <https://www.topuniversities.com/university-rankings/articles/brics-rankings/top-10-universities-south-africa-2016> (accessed November 9, 2017)

<sup>30</sup> Anastasia. “Startup Hubs Around The World: Cape Town”. Cleverism. September 15, 2015. <https://www.cleverism.com/startup-hubs-around-world-cape-town/>

FIGURE 11. QUALITY OF SCIENTIFIC RESEARCH INSTITUTIONS



Other countries in scope of tech entrepreneurship study

Source: World Economic Forum







### 3. Networks

Tech entrepreneurship ecosystems function best when there is a dense array of players and structures with strong relationships between them. This helps entrepreneurs exchange ideas, build teams, get the resources they need, and grow.

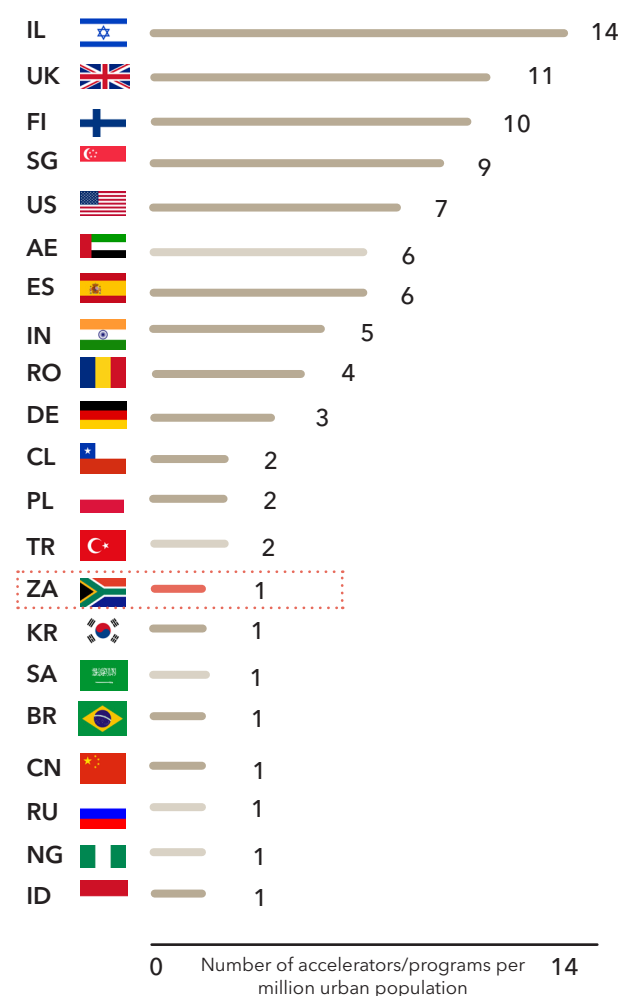
The Gauteng entrepreneurship support system is largely driven by an innovation-focused network of agencies, funds, and regulators aimed at the production and commercialization of innovation and the stimulation of tech entrepreneurship.

Outside of government agencies, a number of other key support systems are privately funded initiatives that enable their sponsors to qualify for ESD points in government bids. These initiatives include incubators, training programs, grants, funds, and tenders.

- The sprawling Innovation Hub, located near CSIR and the University of Pretoria, contains numerous programs and departments aimed at fostering innovation, including the national space agency and various hubs for innovation including mobile apps and health.
- Jozihub is an active co-working space and hub that provides training and workspace to startups on a non-profit basis.

- FNB's FinTech incubator Alphacode features a large number of financial services startups.
- Standard Bank's co-working space offers an open atmosphere for aspiring entrepreneurs and free Wi-Fi.
- Urban hub Tshimologong opened in 2017 as a digital innovation hub with strong ties to the University of Witswatersrand.<sup>31</sup>
- The large-scale Riversands incubation hub on the outskirts of Johannesburg was established in part by the Jobs Fund and is home to 150 businesses.<sup>32</sup>

FIGURE 12. ACCELERATOR DENSITY



Other countries in scope of tech entrepreneurship study

Source: World Economic Forum

<sup>31</sup> Shapshak, Toby. "Joburg's New Digital Hub Aims To Be Africa's Brightest Innovation Center". September 2, 2016. <https://www.forbes.com/sites/tobyshapshak/2016/09/02/joburgs-new-digital-hub-aims-to-be-africas-brightest-innovation-centre/#4b27d9483abe>

<sup>32</sup> Riversands innovation hub. <http://www.riversandsihub.co.za/>

The Gauteng ecosystem is unique in its breadth and number of programs targeted at supporting entrepreneurs, and is perhaps the richest ecosystem in the world

- South Africa is remarkable for the sheer number of support services available. The innovation-targeted programs include incubators, accelerators, training programs, and other entrepreneur support services. Most of the programs are targeted at entrepreneurs from disadvantaged backgrounds. Innovation hubs, incubators, and accelerators provide high-speed internet access, co-working space, innovation support, mentorship, salary support, training, and even stipends to budding entrepreneurs.
- Despite these programs, no single portal or website exists that can guide startups through the support options available, or of the requirements for launching and growing, so most turn to known resources and referrals to get what they need.
- The large number of programs may create some confusion in the market, as overlapping initiatives may be difficult for startups to navigate. In addition, heavy admin requirements and long approval and distribution times mean that entrepreneurs can wait years for approval of basic funds.
- Further, the lack of impact assessments or performance evaluations of the programs may point to wide variations in overall effectiveness.<sup>11</sup>

FIGURE 13. INNOVATION HUB FOSTERS STARTUP ECOSYSTEM WITH ITS VARIOUS PROGRAMS FOCUSING ON DIVERSE SECTORS



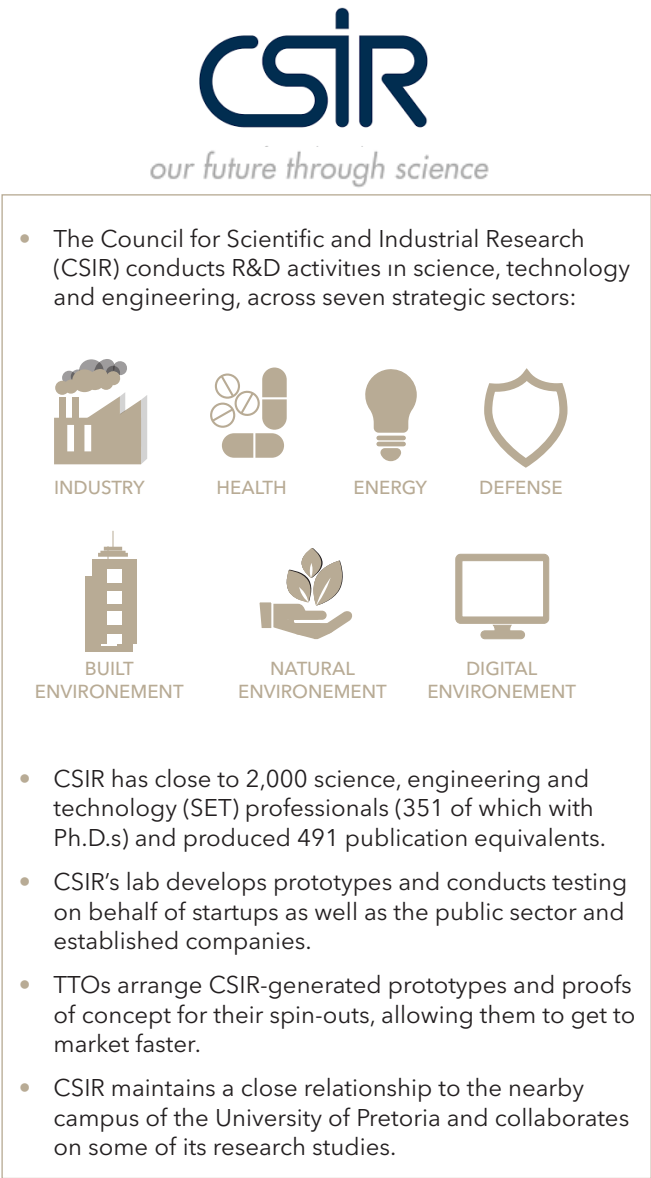
- The Innovation Hub is the innovation agency of the Gauteng Province and aims to foster economic development and competitiveness of Gauteng by promoting innovation and entrepreneurship. Set on a large campus adjacent to the University of Pretoria and innovation commercialization center CSIR, Innovation Hub is a critical part of the strong regional innovation system.
- The Innovation Hub has five business incubators: Maxum Business Incubator for smart industries (IoT, big data and analytics etc.), digital services and media, Climate Innovation Centre, BioPark, township-based eKasiLabs and mobile innovations mLab. There are currently over 260 startups supported by these incubators.
- Apart from business incubators, the Innovation Hub offers two different innovation programs:
  - GAP Innovation Competitors: innovative ideas to improve the efficiency of government service delivery, enhance the competitiveness of the local economy, and lift the living standards of citizens. The prize is R 3.2M (USD 218K) in seed funding and cash prizes.
  - OpenIX (Open Innovation Exchange): Open innovation challenges posted by companies, and enabling African researchers /entrepreneurs to commercialize their innovations.



Source: Innovation Hub

A full spectrum of networks is necessary, especially for entrepreneurs who do not possess relevant background for the sector/domain of their venture. In such cases, collaboration with right people in the relevant network(s) is vital for entrepreneurs - Ela Romanowska - WITS TTO

FIGURE 14.CSIR LINKS INNOVATIONS TO  
COMMERCIALLY APPLICABLE SOLUTIONS



**In the Gauteng ecosystem, networks are tight and service providers know each other, openly collaborating and servicing the same entrepreneurs**

- The community of service providers are close and tight-knit, servicing the same entrepreneurs and collaborating on some projects
- Entrepreneurs often take advantage of a large number of innovation hubs and government programs, graduating from one program and entering another. This high level of support can be sustained for years, in some cases preventing the entrepreneur from having to demonstrate market viability or ever launching a venture.

**Despite strong coverage of training topics in entrepreneurship, mentoring remains an issue as few mentors in the ecosystem have launched and exited businesses**

- Service providers for Enterprise and Supplier Development (ESD) far outnumber the number of experienced entrepreneurs in the ecosystem, and many have begun training programs in response to the opportunity created by available funding. Many ESD service providers are unfamiliar with the needs of startups, and few established entrepreneurs exist to advise budding entrepreneurs.

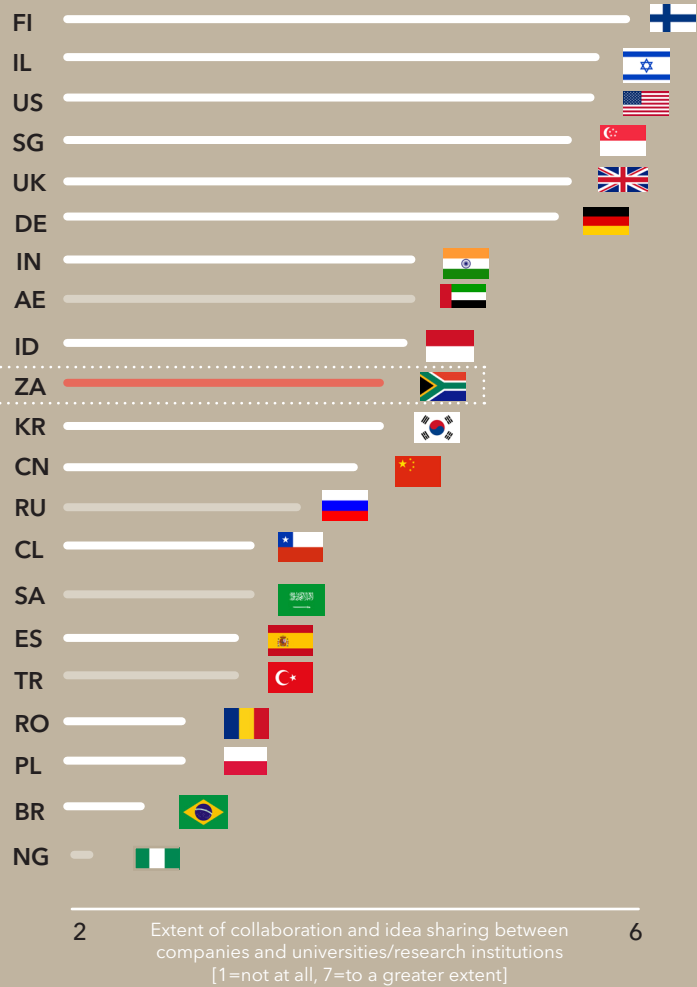
**Entrepreneurs in the Western Cape maintain connections to international markets, often leveraging cultural links to foreign countries**

- While the focus of Gauteng entrepreneurs is often on South African markets, entrepreneurs in the Western Cape are more likely to look to international markets for sales, investment and acquisitions.
- Leveraging ethnic and cultural links, many entrepreneurs establish relationships with investors and customers in the US, UK, and Israel. Cultural similarities between Silicon Valley and the Western Cape ecosystem highlight shared behaviors such as informal meetings between academia, wealthy individuals, and tech entrepreneurs.<sup>30</sup>
- Aligning the ecosystem to international standards has helped the Western Cape ecosystem attract foreign interest, such as the USD 575 m acquisition of Thawte in 1999 by the US's Verisign and the USD 123 million acquisition of GetSmarter by US firm 2U.<sup>18</sup>

**The university-private sector interface is represented by South Africa's 23 TTOs, which play a key role in promoting private-sector R&D and collaborations with startups**

- The private sector in South Africa is just beginning to heavily support tech startups and the tech entrepreneurship ecosystem. Critical to innovation commercialization, many of the initial efforts are formed as partnerships between universities and the private sector.
- University TTOs are expected to play a critical role in building relationships with the private sector. Innovus at Stellenbosch University (in the Western Cape) remains one of the most successful at this, having created 23 spin-out companies and filed for 282 patents since 2000.<sup>33</sup> Innovus is known for its ability to successfully pair innovations and startups with private-sector companies, enabling collaborations, acquisitions, and investment.
- In the Western Cape successful collaborations between private sector tech companies and universities include a mobile app development lab funded by Samsung, and R&D institutions funded by Microsoft and Nokia are key initiatives that highlight the potential for partnerships. Amazon Web Service's presence is also expected to have spillover effects on innovation.

FIGURE 16: UNIVERSITY/INDUSTRY RESEARCH  
COLLABORATION



Other countries in scope of tech entrepreneurship study

Source: World Economic Forum Executive Opinion Survey 2016-2017, OC&C analysis

<sup>33</sup> Innovus. <http://www.innovus.co.za/> (accessed November 16, 2017)





**Cultural expectations and perceptions of entrepreneurship guide entrepreneurial behavior and the level of support from the community. Culture also affects when and whether citizens choose to engage in entrepreneurial activity. Generally, in cultures that support entrepreneurial behavior:<sup>34</sup>**

- People seek to equalize the distribution of power and wealth in society by taking personal initiative, indicated by low scores on power distance.
- There is room for individualism and less preference for communal identification and adherence to social norms and rules.
- Society is highly competitive, celebrating achievement, leadership, and assertiveness traits. People expect to be rewarded materially for success.
- People in entrepreneurial cultures feel comfortable with uncertainty and ambiguity. There is more acceptance of engaging in nonconformist behavior and using ideas to overcome challenges rather than maintaining the status quo.

<sup>34</sup> Hofstede Insights. "The 6 dimensions of a national culture". [www.hofstede-insights.com/models/national-culture/](https://www.hofstede-insights.com/models/national-culture/)



**Based on Hofstede's cultural dimensions, South Africa's cultural profile is relatively similar to that of the United States, suggesting that it has strong potential to build an entrepreneurship culture:**

- Although South Africa has a strong sense of hierarchy, a similarly high sense of individuality suggests that entrepreneurs are regarded well for building wealth for themselves and their families. With a merit-based focus on employment and low responsibility to group cultural norms, entrepreneurs are given a degree of freedom to pursue their ambitions.
- Similar to other countries which have struggled with poverty, South Africans value the present over the future, which is a challenge to building the long-term wealth that entrepreneurship promises. This is further complicated by the economic needs of the most disadvantaged entrepreneurs, who often must balance their ambitions with supporting up to seven members of their household. While many may have long-term ambitions, few from low-income groups are afforded the freedom to pursue it without other sources of income.
- The Gauteng ecosystem is often characterized by a sense of opportunism in which entrepreneurs take full advantage of various government funding and support programs for long periods of time, sometimes without launching an initiative.<sup>35</sup>
- In 2016, IBM launched the USD 61 million IBM Research Lab in Johannesburg, which focuses on healthcare, digital ecosystems and astronomy. The lab will also collaborate with the University of Witwatersrand and Department of Trade and Industry, and Department of Science and Technology.

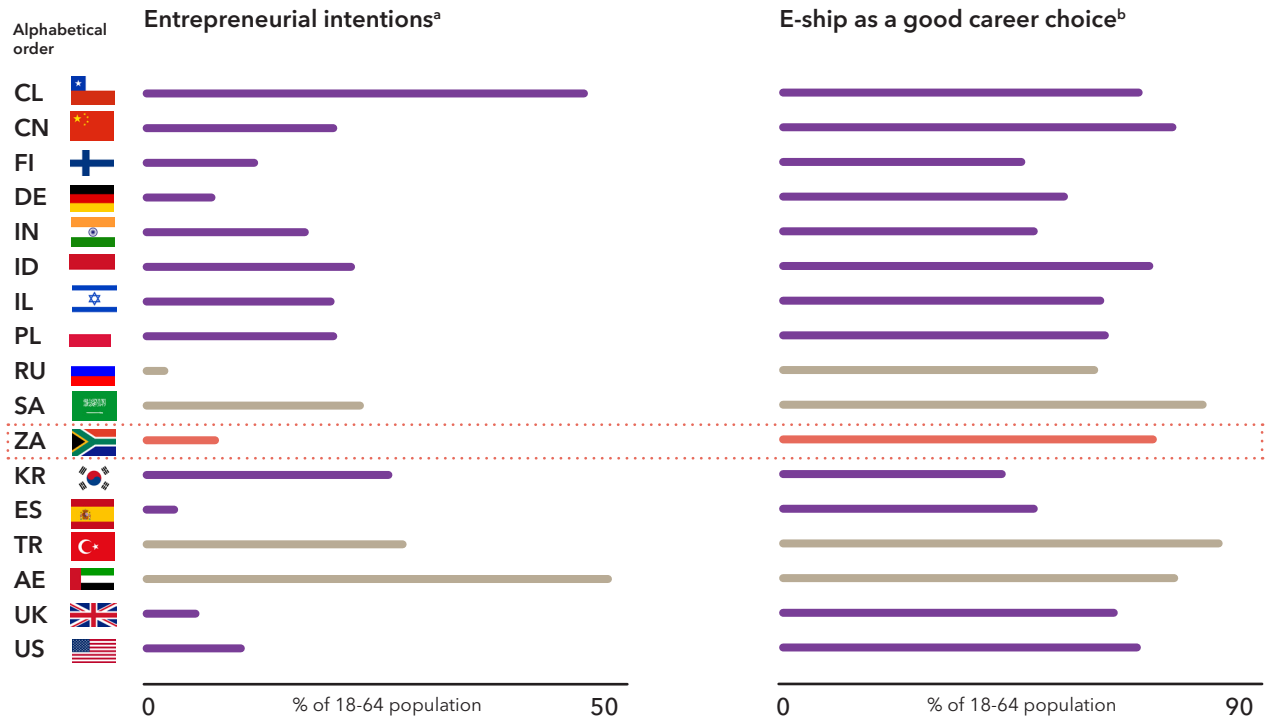
<sup>35</sup> Hofstede Insights. "Country comparison: South Africa vs United States". <https://www.hofstede-insights.com/country-comparison/south-africa,the-usa/>



South Africa's Total Entrepreneurial Activity (TEA), a measure of the proportion of the population engaged in entrepreneurship, was 6.9% in 2016, lower than its emerging market peers. A low tolerance for business failure may be constraining aspirations of entrepreneurship.<sup>36</sup> However, South African entrepreneurs are uniquely motivated to create social impact, a driver of entrepreneurship aspirations largely independent of the likelihood of financial success.

Previously entrepreneurship was mainly a necessity rather than choice for a lot of people. We are interacting with high quality individuals who specifically chosen this course because they believe they have what it takes, they have the idea, they are solving a real need and they can make a real difference- Janice Johnston - Edge Growth

FIGURE 16. ENTREPRENEURIAL INTENTIONS AND PERCEPTION OF ENTREPRENEURSHIP



a. Percentage of 18-64 population (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within three years  
b. Percentage of 18-64 population who agree with the statement that in their country, most people consider starting a business as a desirable career choice  
Source: Global Entrepreneurship Monitor, OC&C analysis

<sup>36</sup> Global Entrepreneurship Monitor. South Africa profile. <http://www.gemconsortium.org/country-profile/108>

South Africa's entrepreneurship history is marked by 'necessity entrepreneurship' for survival, but new government programs look to foster innovation-based entrepreneurship

- Traditionally entrepreneurship was driven by the necessity of overcoming poverty and other limitations which narrowed options for many disadvantaged South Africans. Tech startups and innovation-based entrepreneurship is therefore new, and not yet a part of the aspirations of the most talented tech and business students.
- As a result there are few role models in the ecosystem, particularly for those from previously disadvantaged groups who have created recognized success stories. Instead, success is seen by some as securing a lucrative government contract that creates steady income and employment but few exit opportunities.
- Motivating entrepreneurship by importing the Silicon Valley style 'rock star' culture may not be a good fit for South Africa, which is more community minded. Instead, looking at collectives and group success rates may help to promote entrepreneurship aspirations.<sup>16</sup>

Despite a culture of entrepreneurship, South Africans are largely risk-averse, and highly skilled tech talent rarely turns to entrepreneurship as a first option

- Culturally, many South Africans are largely risk-averse and, while entrepreneurship is becoming more attractive, the risk profile of tech-based ventures may be unattractive for tech talent.
- This risk appetite is also reflected in the VCs and angels, who tend to prefer safer returns over the potential for larger payouts like their counterparts in more mature ecosystems.
- This is likely to be changed with exits that demonstrate the viability of the tech startup ecosystem, and with government programs that lower the personal income/asset risk of entrepreneurship for low-income entrepreneurs.

Entrepreneurs from lower-income segments are a strategic priority for the government, which must address a wider range of needs to support them effectively

- Given existing gaps in education, income, and culture, low-income entrepreneurs have significant requirements to close the gap to traditional South African entrepreneurs, in ambition, skills, and resources.
- Many of these entrepreneurs struggle to see how to manage tech entrepreneurship with personal obligations, given that long return profile of tech entrepreneurship is at odds with the economic needs of their households, which include seven members on average among the chronically poor.<sup>12</sup> Forgoing a salary while building the business, therefore, can impact an entrepreneur's entire family.
- In this regard, some incubators and workspaces provide a valuable service offering stipends or modest employment opportunities. However, even this is not enough to meet the income demands for some entrepreneurs.

The newly developing culture of tech entrepreneurship means that few entrepreneurs are aware of what's required to develop, launch, grow, and exit tech-based ventures

- While the number of government programs and amount of government funding is high, some entrepreneurs may have unrealistic expectations about what launching a venture requires.
- Given that few entrepreneurs have experience in entrepreneurship, some have come to expect that success comes rapidly and with ease. This lack of awareness is also reflected in the low preparedness when they seek equity funding from venture capitalists, which employ a rigorous review process and are largely risk-averse.



## 5. Regulations



Tech entrepreneurship is directly and indirectly affected by a broad range of regulations that have an effect on its business construct, operational domain, and boundaries and source of innovation

### A. BUSINESS PROCEDURES

The ease of executing business functions drives, in part, how many startups can launch and survive. Straightforward business procedures help drive interest to take up entrepreneurship. Streamlined, relaxed, and digitalized procedures minimize back office efforts and allow entrepreneurs to accomplish more with limited resources. Tax obligations, both time and cost wise, can affect a startup's growth, especially in the early years when cash flow is uneven.

Regulatory and legislative practices around business, particularly dispute resolution, serve to reassure both startups and their investors of how their rights will be protected as well as any costs of protecting themselves. Bankruptcy legislation is also important, because the legislation can be a significant motivator or deterrent to starting a business.

Compared to its neighbors, South Africa's business regulation is relatively straightforward, but bureaucracy may create delays and raise costs. South Africa ranks 74<sup>th</sup> in the World Bank's Ease of Doing Business assessment, reflecting high regulatory mandates and similarly high costs of doing business for basic business procedures.

**The government's strong focus on entrepreneurship means that a number of support services and procedures are aimed at reducing time to market and enabling new business starts**

- The government has introduced automated business registration procedures that have cut down the time to establish a business; however, other processes such as registering workers for social programs and getting required audits and inspections can delay the launch process.
- A study of 500 firms found that 40 percent find government bureaucracy burdensome enough to limit business growth.<sup>12</sup> The practice of sector-specific licenses has also created complexity for young, innovative businesses that span multiple functions.
- A variety of support services that including consulting and registration support exist to help startups, although there is as yet no centralized portal as a one-stop-shop for entrepreneurs to source all the help they need.<sup>11</sup>
- In the coming years, the government will introduce regional 'one stop shops' aimed at attracting FDI into South Africa and raising the profile of local small businesses.

The business procedures are not difficult to cope with, yet what makes it difficult for entrepreneurs is not understanding them well enough and not knowing where to go - Conny Phaswana - The Innovation Hub

**Pro-labor employment laws create important workforce protections, but these must be balanced against incentives for SMMEs to hire full-time employees while maintaining the flexibility to tailor their workforce as needed**

- South Africa's history of economic marginalization is being countered through laws designed to protect workers' rights and help prevent exploitation. Strict severance procedures and a minimum wage of R20 per hour (USD 1.5), soon to come into effect, are two requirements that affect any company hiring full-time employees.<sup>12</sup> Violating these procedures can trigger expensive penalties or settlements.
- Due to SA's high unemployment rate and poverty levels, these laws are designed to promote sustainable employment and encourage larger participation in the economy. However, since these laws are applied to companies regardless of size, small companies face a greater challenge to employ and release staff. Employee-related regulations are perceived as the most burdensome regulations by SMMEs.<sup>19</sup>

- This challenge means that many tech startups avoid hiring full-time employees until absolutely necessary, instead relying on contractors or temporary employment. The labor regulations may actually be adversely impacting the number of people hired into full-time employment in the tech entrepreneurship sector, counter to the government's objectives for job creation.

**Bankruptcy protection is available in South Africa, although the extensive process can trigger long-term effects on entrepreneurs**

- At 75 percent, South Africa's failure rate is one of the highest in the world.<sup>23</sup> Small businesses are given the ability to file for bankruptcy protection in South Africa, nominally enabling them to protect themselves in the event of failure.
- However, the pro-creditor process requires significant legal approvals and leaves a lasting record for 10 years, affecting an entrepreneur's ability to find funding or support for subsequent ventures.<sup>11</sup>



<sup>36</sup> World Bank. "Doing Business June 2017." <http://www.doingbusiness.org/rankings> (accessed January 24, 2018)



B. DIGITAL POLICIES

The benefits of the internet economy are vast but also bring about growing concerns around privacy, security, crime, and anticompetitive practices. Striking the right balance between capturing the benefits of the internet, while mitigating its potential risks, has become a challenge for policymakers around the world.

The regulatory sector has put in place a policy framework for most digital policy areas, including data privacy, IP protection, internet use, e-commerce, and cybersecurity.

Digital policies are largely in line with international standards, and policymakers say they favor freedom of expression and fair competition

- The Electronic Communications and Transactions Act (ECT) regulates the e-commerce operations in South Africa, and includes recognition of electronic signatures, a development that can ease the ability of tech entrepreneurs to secure partnerships. However, complying with the requirements can be a cumbersome process.
- South African public policy aims to preserve freedom of expression on the internet, and enable access to information, innovation and economic growth. Freedom of expression is secured by the South African Constitution with some exceptions to preserve the welfare of society.
- The government favors net neutrality as outlined in its National Integrated ICT Policy whitepaper, and other laws related to cybercrime and data privacy are in line with international standards.

The high costs of IP enforcement may prevent startups from successfully defending their rights, once they have identified infringements

- IP enforcement rights are in place in South Africa, yet the high costs may deter startups from pursuing cases even when there is a clear violation. Larger companies with significant legal budgets are able to outspend smaller startups, which may decide to abandon legitimate cases due to cost alone.
- No established monitoring system such as a central database exists for startups to identify, source, and track infringements to their IP rights, which may leave them vulnerable to infringement by larger players.
- Creating a smaller court requiring less representation and documentation to enforce IP infringements would lower costs and make successfully defending IP within reach for more South African startups.

C. TRADING ACROSS BORDERS

Much of the national development plan is designed to promote exports, and the framework has aimed to streamline the process for businesses to export South African goods and services to other countries. South Africa’s location within Africa and links to Europe and other regions makes it ideal for testing and exporting innovations targeted at low-income populations in other African nations.

Cross-border transactions are highly regulated, with all cross-border payments needing to be reported to the South African Reserve Bank.<sup>37</sup> Similarly, foreign e-commerce providers of online books, music, and other services must register and collect VAT, similar to requirements in an increasing number of other countries.<sup>38</sup>

<sup>37</sup> South African Reserve Bank. "Guidelines: Balance of Payments". <https://www.resbank.co.za/RegulationAndSupervision/FinancialSurveillanceAndExchange-Control/Guidelines/Pages/default.aspx>

<sup>38</sup> PWC South Africa. "More regulations expected on cross-border transactions". <https://www.pwc.co.za/en/press-room/cross-border-transactions.html>

Given IP laws, licensing IP across borders creates complexity that must be managed

- The exchange control restrictions that oversee cross-border funds transfer have far-reaching effects on the acquisition of South African IP as well. Foreign acquirers of South African IP or startups with proprietary IP must register the transaction as a cross-border exchange of capital, which can have tax implications.

- Many startups which would otherwise be registered in South Africa may instead be registering their innovation-based businesses outside, to take advantage of jurisdictions that enable freer transfer of IP between parties where there are international investment interests.
- Some in the Gauteng ecosystem have suggested that the focus on cross-border IP transfer should instead be a focus on taxing cross-border licensing revenues, to protect the government’s financial interests while encouraging South African domiciled innovation registrations.

FIGURE 17. CROSS-BORDER IP TRANSACTIONS AND IPR ACT



Source: EE Publishers, Ventureburn, Rory Moore, UK Government



D. GOVERNMENT’S R&D POLICIES

A large amount of funding, infrastructure development, and regulatory focus is directed at R&D, with the aim of improving South Africa’s innovation capabilities

- Though just 0.7 percent of GDP, spending on R&D is a major focus of the South African government, which spends more on R&D than business. Government R&D funding is typically targeted at basic research and human capital development, while private-sector R&D spending is concentrated on product development and increasing competitiveness.<sup>39</sup>
- Like their counterparts in other emerging markets, South African private-sector firms benefit from a high return on R&D spending, ranging from 118 percent to 294 percent in South Africa.<sup>11</sup> Despite a high return and a dedicated focus by government programs and agencies to improve the interface between public and private-sector R&D, private R&D spending is low and fell by 40 percent between 2009 and 2016. A combination of bureaucracy, an uncertain political environment, a skills gap, and insufficient IT and transportation infrastructure probably contribute to this trend.<sup>40</sup> This limited investment in R&D may hinder the capability of the country to innovate in the following years.

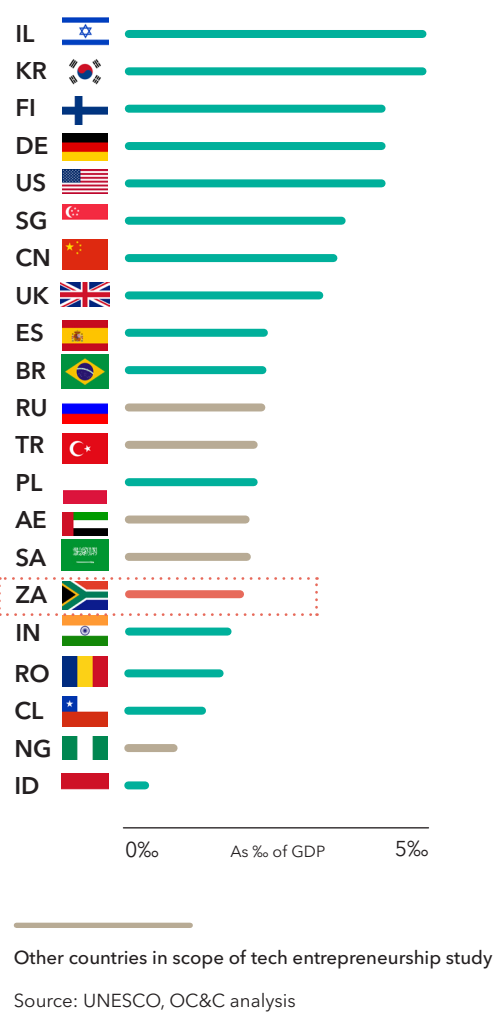
Exchange Control Regulations and Intellectual Property Rights from Publicly Financed Research and Development Act (IPR Act) was written to protect the interests of South Africa and South African universities, but several features may affect how startups register their business and attract funding

- According to the IPRA, university-generated IP in spin-outs is owned by the university until its R&D costs are fully paid off by the prospective acquirer. This is still the case even when a private sector company seeks to acquire a startup founded with university-generated IP. While this ensures that the university recoups the R&D costs of successful spin-outs, it could be a put off to private-sector companies looking to acquire innovations or innovation companies, as R&D costs do not always reflect market value.
- The Exchange Control Regulations oversee the treatment of IP acquired cross-border by foreign investors. With each transaction requiring approval, intellectual property is treated as capital and potentially subject to taxation. Recent reforms have relaxed some of these mandates, but overall the regulatory framework is still seen as a barrier to cross-border acquisitions. Instead, many entrepreneurs register innovation-based companies outside of South Africa.

Tax incentives have been developed to stimulate private-sector R&D spending; however, more refinement is needed to balance bureaucracy with effectiveness

- Currently companies can qualify for tax deductions of up to 150 percent of their scientific or technological R&D spending.
- Over the years, reforms have been introduced to reduce application fraud. While this has raised the accuracy of applications, it has presented a special burden for small companies ill-equipped to handle the long and complex processes.<sup>12</sup> As a result, the R&D activities reported by small companies plummeted after the reforms were introduced in 2012.
- A partnership between the government’s Davis Tax Committee and World Bank will examine the impact of the existing R&D tax credits<sup>11</sup>, in turn enabling further refinements to speed approval times and use a rigorous process for assessing and monitoring projects.

FIGURE 18. R&D EXPENDITURE AS A PERCENTAGE OF GDP, 2015

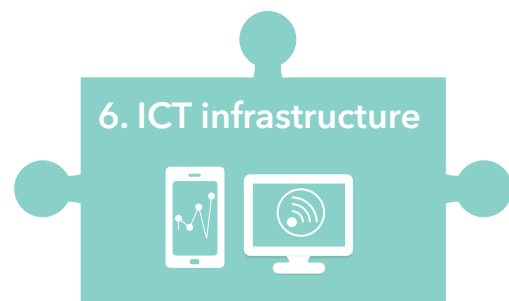


<sup>39</sup> Research. "Rocky road ahead for South African research". [http://www.researchresearch.com/news/article/?option=com\\_news&template=r\\_r\\_2col&view=article&articleId=1357758](http://www.researchresearch.com/news/article/?option=com_news&template=r_r_2col&view=article&articleId=1357758) (accessed November 14, 2017)

<sup>40</sup> Creamer, Terrence. "World Bank blames lack of innovation for South Africa's dismal productivity performance". Creamer Media's Engineering News. September 17, 2017. [http://www.engineeringnews.co.za/article/world-bank-blames-lack-of-innovation-for-south-africas-dismal-productivity-performance-2017-09-19/rep\\_id:4136](http://www.engineeringnews.co.za/article/world-bank-blames-lack-of-innovation-for-south-africas-dismal-productivity-performance-2017-09-19/rep_id:4136)







## 6. ICT infrastructure

Widespread coverage of high-speed internet at affordable prices reflects the ability of the ecosystem to support rapid knowledge-sharing and dissemination of new technologies to the wider population. It also highlights the ability of the wider market to consume tech enabled products and services.

Cloud services allow businesses, especially tech startups, to lower their capital expenditure and IT cost structure by providing hardware, infrastructure, software, and application requirements as a service instead of capital investments, increasing their business agility and operational resilience. Moreover, studies indicate that increased access and usage of cloud computing services positively correlates with the level of innovativeness of a country.

ICT's contribution to South Africa's GDP was around 3 percent in 2014, even bigger than the contribution made by agriculture.<sup>41</sup> While two thirds of the economic activity related to telecommunications, the remainder consisted of data and software services and manufacturing of electronic components and devices for the sector. An ongoing program to roll out internet coverage has meant improvements to the availability of internet services, though overall coverage remains low outside the major cities. Few have access to internet within their homes, one of the main drivers for the large number of innovation hubs that offer free high-speed access to tech entrepreneurs.

<sup>41</sup> Stats SA. "Three facts about the ICT sector". <http://www.statssa.gov.za/?p=9852>



South Africa has one of the most expensive fixed and broadband prices among BRICS countries, and the government is addressing this in its "National Integrated ICT Policy" white paper.<sup>42</sup> The related Digital Development Fund allocates funds for infrastructure development and stimulating demand, with a focus on infrastructure extension, digital literacy skills development, and accessibility for government services including e-health and e-education. As a result, the government expects to achieve a "people centered, development oriented and inclusive digital society".<sup>43</sup>

Building up the ICT infrastructure will also help achieve other social aims, as one UK report found that access to the internet also enabled economic growth and equality.<sup>44</sup> For lower-income South Africans, access to broadband, smartphones, and other digital technologies is quite limited. This may, however, present the opportunity to create leapfrog technologies that use disruptive digital platforms to provide basic services.

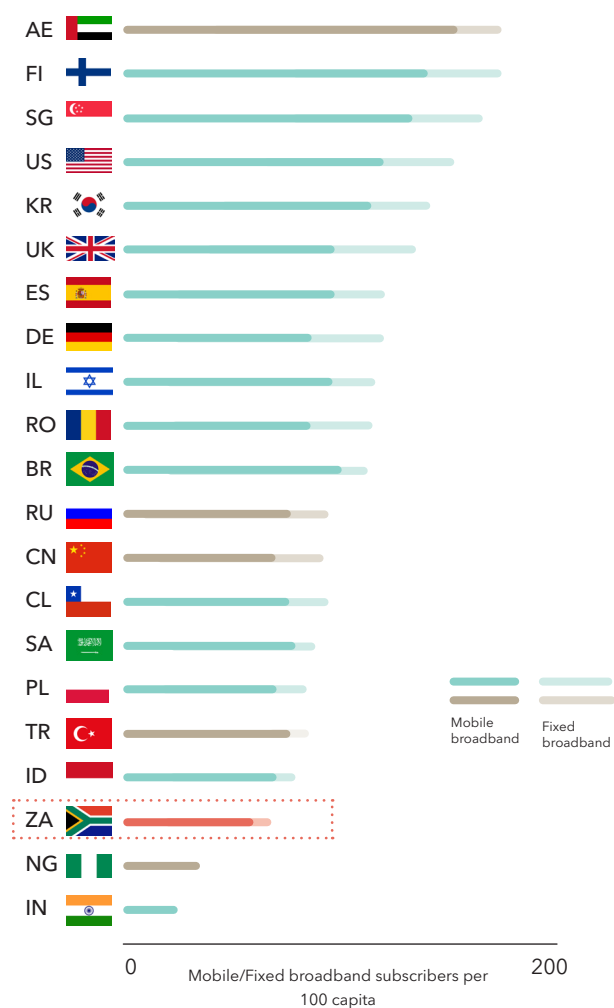
<sup>42</sup> ITU. "Measuring the Internet Society Report 2016". <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx>

<sup>43</sup> Department: Telecommunications and Postal Services. "National Integrated ICT Policy". [https://www.dtps.gov.za/images/phocagallery/Popular\\_Topic\\_Pictures/National\\_Integrated\\_ICT\\_Policy\\_White.pdf](https://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National_Integrated_ICT_Policy_White.pdf)

<sup>44</sup> UK Cabinet Office, Government Digital Service. "Government Digital Inclusion Strategy". 2014



FIGURE 19. MOBILE/FIXED BROADBAND PENETRATION, 2016



Other countries in scope of tech entrepreneurship study

Source: International Telecommunications Union

Government programs have aimed to provide 100% coverage throughout the cities as part of its commitment to modernizing the economy

- Programs aiming to provide 100% coverage across major cities such as Johannesburg and Pretoria seek to increase access to the internet for citizens of all income levels, given low in-home coverage.
- These programs, though ambitious, have been slower to roll out than planned, leaving internet penetration at sluggishly low levels.
- In Cape Town, a USD 10 million city project on expanding broadband access increased the fiber optic network to 500 km.<sup>30</sup>

Mobile data packages are quite expensive given average incomes, a constraint to both the production and consumption of internet services such as apps

- Mobile data packages remain out of reach for many South Africans. These are both slower and costlier than in other countries and cost as much as five times the rate in Egypt.<sup>12</sup>
- This could be a limiting factor for a wide variety of solutions that are app-based or that require a steady connection to be effective.

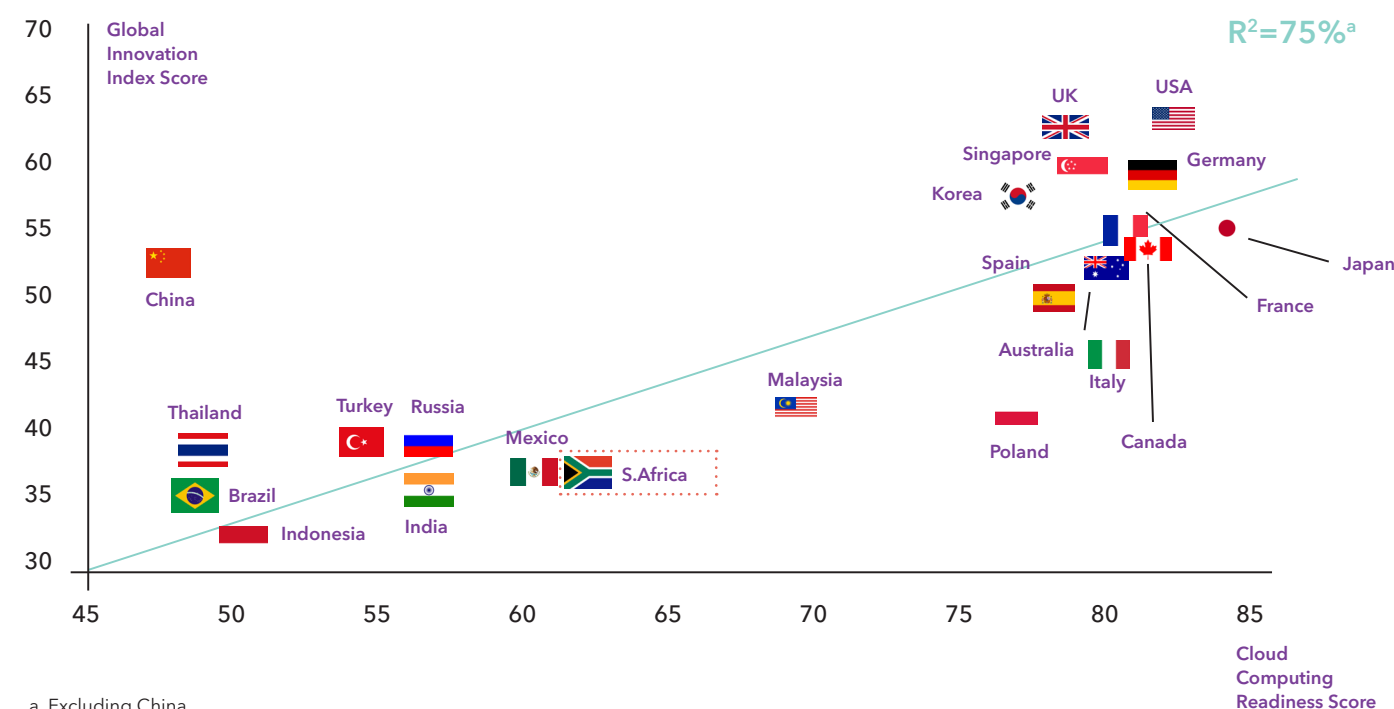
We haven't even scratched the surface in connectivity at home. The majority of South Africans do not have access to internet at home. They may have more access via mobile, yet data is expensive. Access costs to learning and information via the mobile network are planning to be decreased, but there is no resolution to that yet - Samantha Manclark - Jozihub

Cloud computing and data storage options are widely available in South Africa, with a strong presence of international providers and promising commitments from the government and the private sector

- Like other African countries, the low-cost nature of running internet services on the cloud has been attractive to public and private sector entities in South Africa, which have turned to cloud computing to reduce IT capital expenditure while increasing efficiency.<sup>45</sup>
- South Africa's data centers are concentrated in Johannesburg and Cape Town, though the government plans to expand data centers and hosting services to the other regions, and promote both public and private demand for cloud data services.<sup>43</sup>

- Major international players are present with a variety of services in data storage, site hosting, and related platforms and software services, including offerings targeted at SMMEs.<sup>45</sup>
- The private sector has embraced the cloud with as much as 93% of companies developing a cloud strategy or in the implementation phases.<sup>46</sup> Those companies that are not planning the move to cloud may have concerns about the levels of local infrastructure, strength of data protection, and their own conservative investment strategies.<sup>47</sup>
- The government will also stimulate cloud adoption when it shifts to cloud services as part of a 2017 commitment to use cloud computing for citizen services, and managing the workflow of key service areas in education, health, and justice.<sup>48</sup> This migration is expected to achieve cost reduction, effectiveness and IT efficiencies in government services.<sup>49</sup>

FIGURE 20. CLOUD COMPUTING PLAYS AN IMPORTANT ROLE IN CULTIVATING INNOVATION  
CLOUD COMPUTING - INNOVATION RELATIONSHIP



a. Excluding China  
Source: Business Software Alliance, INSEAD Global Innovation Index, OC&C

<sup>45</sup> Gillwald Alison, and Moyo, Mpho. "The cloud over Africa". researchICTAfrica.net.

<sup>46</sup> Tredger, Chris. Cloud first is the name of SA's IT game. IT Web Africa, May 11, 2017.

<sup>47</sup> Nebula. "Cloud Computing in SA- an Industry Update" <https://www.nebula.co.za/2017/05/22/cloud-computing-sa-industry-update/>

<sup>48</sup> IT News Africa. "SA Government's Cloud pledge". <http://www.itnewsafrika.com/2017/06/sa-governments-cloud-pledge/>

<sup>49</sup> Maluleka Motlatsi, Simon; Ruxwana, Nkqubela. "A Framework for Cloud Computing Adoption in South African Government". International Conference on Business Management & Information Systems.

## 7. Market potential



The addressable market size for tech startups in a country is a function of the national economy, digital literacy and readiness of customer groups and consumer habits affected by internet/mobile coverage as well as the propensity to try new products and services. Other factors such as access to corporate customers and internationalization opportunities define startups' growth opportunities.

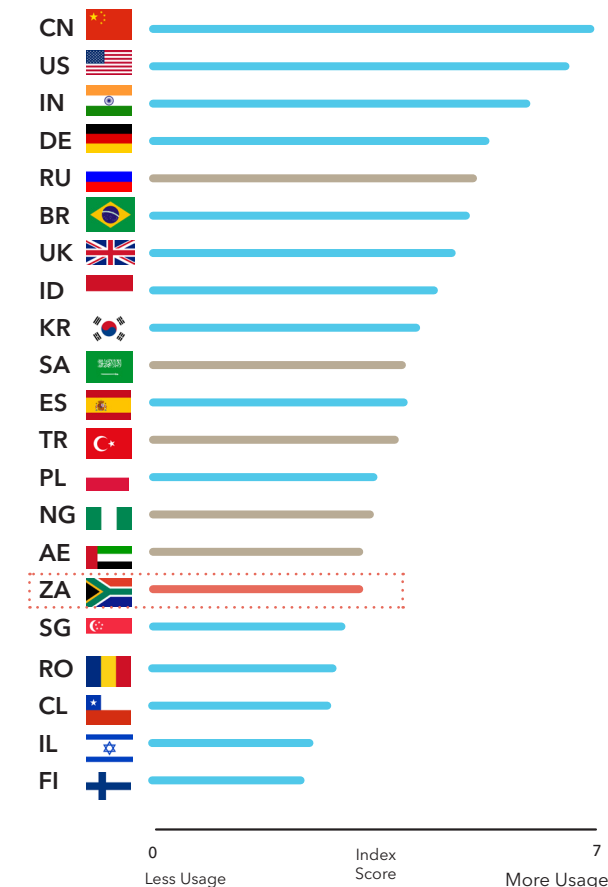
The government can impact the size of the market with consumer protection and competition rules, by building public confidence in online services, and especially via procurement programs and policies.

In South Africa, uneven internet coverage and high mobile data rates constrain the market for internet-enabled services. Tech startups based on services that require a steady internet connection find the addressable market is limited, even more so if they want to target a premium segment given their low numbers.

Aiming to increase the addressable market for local tech startups, the South African government has implemented a number of public and private procurement programs, coupled with mandates for supporting the capacity of SMMEs to deliver.

Competition policy has focused not just on removing barriers to free competition, but also to take into account the public interest and social inequality considerations. Otherwise, it's at par with competition frameworks of the OECD countries it's modeled on.<sup>11</sup>

FIGURE 21. MARKET SIZE



Other countries in scope of tech entrepreneurship study

Source: WEF The Global Competitiveness Report, OC&C analysis

Private-sector contribution to the ecosystem was limited, but large firms now see the value of startups operating in their verticals -Samantha Manclark - Jozihub

Despite government programs designed to promote public and private-sector procurement from small businesses, market access remains a key challenge for many entrepreneurs

- Large, established companies dominate the South African economy, far outpacing the SMMEs that contribute just 35 percent to GDP.<sup>12</sup> These larger firms typically have little experience of or appetite for working with startups.
- The financial services sector serves as an exception to this rule, given its reliance on innovation to remain competitive. Banks seeking FinTech solutions have been active in developing the tech ecosystem market via investment, incubation, and procurement. These partnerships have enabled them to use innovations to remain competitive.
- Despite a strong focus on making small businesses competitive, 22 percent of entrepreneurs in one study claimed that access to markets and customers was the primary challenge for their businesses.<sup>19</sup> In particular, support in sales, testing, and prototype production facilities are required.

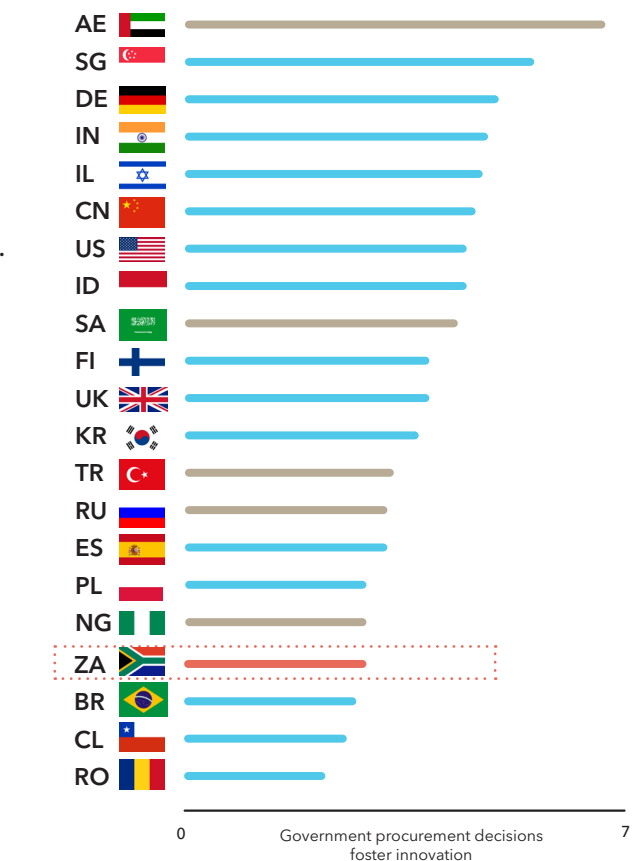
Public procurement represents 12% of total GDP, a significant driver of market potential for startups

- The strong government commitment to supporting entrepreneurs has created a large market for small businesses to serve the government, with many seeking to achieve the lucrative contracts that certify steady income and medium term success. As much as 12 percent of GDP is spent on small business procurement in South Africa, and a mandated 30 percent of every government contract is carried out by BEE small businesses<sup>11</sup>, creating a massive opportunity for entrepreneurs who can meet government requirements.

Reaching the full potential of South African entrepreneurship may involve a focus on addressing the problems and challenges of underprivileged communities

- Due to South Africa's unusual mix of culture, languages, and socio-demographics, it's well positioned to create an innovation agenda around solving critical problems related to poverty, health, and other challenges.
- As a test bed for innovations, South Africa has already demonstrated its value to the medical community, which regularly uses the Western Cape to test valuable life-saving medications and devices for HIV/AIDS and other therapy areas.

FIGURE 22. GOVERNMENT PROCUREMENT OF ADVANCED TECH PRODUCTS



Other countries in scope of tech entrepreneurship study

Source: WEF The Global Competitiveness Report, OC&C analysis



# Recommendations designed to strengthen the tech entrepreneurship ecosystem

The South African government has been strongly committed on supporting entrepreneurs and innovators in the tech ecosystem, with a detailed and thorough offering of resources, funding, private-sector incentives, and regulatory oversight. Focusing on raising the effectiveness of existing efforts and tailoring incentives to desired outcomes will aid the country in addressing the jobs and innovation agendas. Four areas of focus have been identified:

FIGURE 23. POLICY RECOMMENDATIONS DESIGNED TO STRENGTHEN THE SOUTH AFRICA TECH ENTREPRENEURSHIP ECOSYSTEM



## Focus on building the foundational skills of entrepreneurship

### Improve education equality, via inclusion and teacher education programs

A national curriculum, coupled with in-depth teacher training, could help ensure that teachers are equipped to give students the education required for success. One study found that many teachers were unable to correctly answer mathematics questions given to their students.<sup>50</sup>

Creating a teacher education program that ensures all teachers have the skills and tools to be effective in the classroom would improve the outlook for students in the poorest of areas. And by focusing on teachers in disadvantaged areas, perhaps via centralized training programs at regional centers and funded by the government, teachers could acquire the skills they need in a standardized environment.

### Build foundational skills in reading and math through a literacy program

The scale of South Africa's education gap is large, with foundational skills in reading and math particularly low, even compared to economically challenged countries in Africa. Through a sustained focus on basic literacy and math skills, particularly in the rural and lower-income areas, the government can ensure that all students have the basic foundations that can later be built into entrepreneurship capability.

### Introduce entrepreneurship within early education, provided there is a strong foundation of reading and math

Once the foundational skills in reading and math are established in a school, entrepreneurship can be added to the curriculum. Introducing young children to the concepts, skills, and activities of entrepreneurship would help prepare them for careers as entrepreneurs or within startups and small companies. This would help set expectations of what is required as well as stimulate appetite for self-employment.

## Teach functional business expertise via certificate programs to upskill the potential startup workforce

So far, the focus on education and training has been to prepare technically skilled individuals to participate in the digital economy. However, growing tech companies are just as reliant on specialist business skills expertise in areas such as sales, project management, accounting/finance, marketing, and human relations. A focus on functional business expertise would equip much of the workforce to join existing small business teams, as well as potentially enable them to launch entrepreneurial endeavors around their focus areas. Certificate programs and formal training courses, as opposed to ad hoc workshops and seminars, would ensure that staff are properly skilled for these roles. If these courses happened within incubators serving entrepreneurs and focused on new graduates or the unemployed, matchups between entrepreneurs and newly qualified specialists are more likely to happen.

### Fill skill gaps with immigration targeted at developers and teachers

In the short term, gaps in teaching and skill development can be filled by targeted immigration programs. Because South Africa scores lower than many of its Sub-Saharan counterparts in reading and math, yet is more developed, qualified teachers can be drawn to South Africa from other countries for direct teaching and/or teacher training programs.

In terms of entrepreneurship, immigration could help fill the software development skills gap by attracting highly skilled developers to South Africa, with or without their own companies. The South African government cannot limit the salaries offered by the private sector to skilled developers, but it can play a leading role in increasing their numbers and reducing scarcity.

<sup>50</sup> The Economist. "South Africa has One of the World's Worst Education Systems: Why it is Bottom of the Class". January 7, 2017. <https://www.economist.com/news/middle-east-and-africa/21713858-why-it-bottom-class-south-africa-has-one-worlds-worst-education>

**Improve effectiveness of economic inclusion initiatives that foster and Support entrepreneurship**

**Maintain focus on inclusion of the economically disadvantaged into Black Economic Empowerment**

Black Economic Empowerment (BEE) has had a major impact on the South African public and private sector, transforming the ownership and management structure of companies and shifting the balance of power away from the historical elite. However, while this has helped to foster ethnic diversity within companies, some believe it hasn't yet involved economic inclusion on a large scale. Maintaining a focus on the economically marginalized will help the South African government achieve BEE's economic development aims, as well as raise the quality of life for the majority of South Africans.

Given the high qualifications required for many private sector contracts, South Africa's long history of disadvantaged groups may mean that many groups face challenges to qualify. A continued focus on economic access, coupled with incentives to hire or contract firms that work in rural or poorer areas, will probably help expand its reach and impact. And minimizing incentives to award contracts to the same individuals could continue to expand access to the benefits.

**Create monitoring systems to evaluate the effectiveness of existing programs and identify best practices to share across initiatives**

Enterprise and Supplier Development (ESD) programs were created to help facilitate private-sector procurement of small business services, by increasing capacity of smaller firms to deliver. These programs have fueled a vast support structure of innovation hubs, incubators, co-working spaces, training programs and funds. Incubators often focus on maximizing the number of qualified entrepreneurs they serve, but spend less time on monitoring and evaluation for effectiveness. As a result, there is poor understanding, especially within the Gauteng ecosystem, about which interventions are the most effective.

Instituting monitoring programs could come as part of a multi-stage process. First, surveying incubators and innovation hubs/co-working space to determine the total number of companies and entrepreneurs being helped, as well as which programs they offer. Second, conducting a short and a long-term study of the effectiveness of these programs, by interviewing entrepreneurs on the support they received and their perspectives of its effectiveness. Also, this stage could institute a study that looks at success and expansion rates (by the number of people hired) by the type of program offered. Last, best practices could be gathered and circulated among ecosystem providers.

**Create 'one stop shops' featuring standardized information on both public and private-sector entrepreneurship programs**

A persistent concern among ecosystem providers was that entrepreneurs were largely unaware of the programs available to them. Although there are targeted portals and programs such as Finfind.com, no single government portal exists that educates entrepreneurs on both public and private sector programs.

This portal could link to existing resources such as Finfind, but could also feature standardized profiles of different programs so that entrepreneurs can identify the right one for them. Introducing business advisors to help guide entrepreneurs through options in person can also be an effective way to ensure they get the help they need. Collecting and publishing reviews of programs would also help entrepreneurs assess their effectiveness.

**Reduce bureaucracy through end-to-end monitoring of regulatory impact and targeting bottlenecks**

South Africa's relatively high degree of bureaucracy may be affecting the ability of tech startups to launch and grow quickly. The 'red tape' that many entrepreneurs cite can both delay and make the process of starting a new business more expensive.

In some cases, the law as written requires minimal bureaucracy, but eligibility requirements or other components of the law require an entrepreneur to undergo significant documentation or lengthy processes to qualify. Taking an 'end-to-end' approach to reviewing the legislations for business launch, operations (especially labor regulation), business liquidation and bankruptcy could help the government identify and address bottlenecks.

**Introduce growth-stage support mechanisms to pave the way for tech entrepreneurs to scale up**

**Create exemptions from labor regulations for tech startups**

Current laws in place are designed to prevent exploitation of labor, which is especially important in a country with a great deal of natural resource extraction activity. However, the 'one-size-fits-all' nature of labor requirements means that, unlike large mining companies, small startups don't typically have the knowledge or support staff to properly manage hiring. As a result, many are minimizing or delaying the number of full-time hires.

Creating exemptions for small businesses/startups, coupled with complaints and monitoring procedures, could protect the general rights of tech workers while encouraging long-term employment. In this way, restrictions and requirements could be reduced for eligible tech startups.

**Shift some support mechanisms to growth-stage companies to focus on sustainable job creation**

To date, the focus on job creation has involved developing entrepreneurship and new company starts. The high level of support for new entrepreneurs provides many training on the early stages of business. However, far less support exists to ensure the company is sustainable in the long term and can continue to grow. These skills oblige the entrepreneurs, and their staff, to acquire more specialized functional business skills and to access more complex or export markets. This requires

support, sometimes years after young companies have left innovation hubs and co-working spaces. Rebalancing funding and efforts to include more focus on growth-stage companies may support the sustainable job creation priority, given the high failure rate of new businesses.

**Cross-fertilize South African ecosystems to leverage best practices stimulating growth**

The Gauteng and Western Cape tech startup ecosystems are distinct in their market focus areas, amount of funding, type of entrepreneurs, and support from the government. The Gauteng ecosystem is largely marked by strong government support offered via a wide range of programs for young companies. The Western Cape ecosystem resembles the tech ecosystems in other markets that are organic in terms of networking and support mechanisms and offering a versatile funding landscape driven by greater participation of private-sector angels, VCs, and family offices.

While the Gauteng ecosystem has focused on supplier development and increasing the capacity of disadvantaged groups, the Western Cape ecosystem is marked by a more professional approach to wealth and value creation. Cross-fertilizing the two ecosystems could bring benefits to both. The Gauteng ecosystem might improve with greater access to traditional funding mechanisms and a more commercial focus, while the Western Cape ecosystem might attract greater numbers of entrepreneurs by offering more training and incubation support to those without an entrepreneurship background.

**Foster linkages between private investors and innovation hubs to increase the commercial savviness of support programs**

The high numbers of innovation hubs and support programs in the Gauteng ecosystem represent a significant opportunity for entrepreneurs to focus on launching their business, supported by training and early-stage grant funding. However, the follow-on steps of getting angel and institutional funding from business angels and venture capital funds is a challenge, with few launched startups going on to secure follow-on funding.



By fostering relationships between innovation hubs and investors, entrepreneurs could receive the kind of support needed to garner investment after leaving the innovation hub, and the hub can serve as a connection between the entrepreneurs and their investors.

**Review existing tax exemption structure for VCC (12J) initiatives to ensure they're aligned to desired outcomes for investment**

Existing tax exemptions for VCC companies are generous, and designed to stimulate investment into the tech ecosystem. However, the program's restrictions may outweigh its attraction and, as a result, venture capital companies still struggle to attract sufficient funding.

Reviewing the VCC requirements in depth may pinpoint barriers to increased investment in VCCs by wealthy individuals. Ensuring that the exemptions are appropriately sized and delivered, and approvals are streamlined, can affect the attractiveness of the program to individuals. Further, exploring other types of capital under the program and relaxing eligibility requirements may make the program more effective.

**Increase exports and cross-border collaborations by supporting growth-stage companies to attract foreign interest**

Though many of the government's interventions are aimed at new business starts and first-time entrepreneurs, an opportunity exists to focus on later-stage growth via export and cross-border transaction help. This will not only improve the long-term prospects of the company by improving market prospects, but also help support South Africa's economic development agenda.

**Create regional innovation leadership by improving the commercial outlook for innovation**

**Expand the reach and accessibility of internet to create a significant addressable market**

South Africa's internet infrastructure is still in the development phase, with few citizens having access at home and even fewer with

regular mobile access, due to the high costs of mobile data packages. Government initiatives to expand access have so far focused on providing entrepreneurs with high-speed access at innovation hubs, and creating ambitious urban coverage programs.

The access that these programs can offer will open the market for tech startups that offer internet and mobile services, particularly for consumer services. Services that rely on continuous coverage, mobile access, mobile apps, or in-home services are likely to benefit significantly.

**Adapt a sector specialization approach to establish first regional then global leadership**

Currently, the full range of support is offered to startups regardless of their focus area. However, an opportunity exists to create centers of excellence and innovation specialties that can help attract research projects, private-sector involvement, foreign investment and funding. Thailand had done this successfully by developing specialist expertise and global leadership in automotive rubber. The country has attracted major international tire and automakers to establish R&D centers there, and match government R&D investment.<sup>51</sup> South Africa's current broad-based approach (eight-sector focus) doesn't allow it to establish this level of international expertise.

Mining processes, low-tech medical diagnostics, and water purification are all areas identified by entrepreneurs as specialist areas where South Africa already has a sector advantage. Strategic support, funding, research and training in these or other innovation areas could establish global leadership in one or more areas. Once expertise is established, the government can target foreign investment via targeted incentives for companies that invest alongside them or establish R&D centers or other offices.

South Africa's location at the tip of Africa and strong connections to countries in Europe and North America make it well positioned to launch and test solutions aimed at the African continent. Medical testing in the Western Cape

has already taken this approach for some therapy areas, and South Africa now regularly draws medical professionals from around the world to conduct trials and experiments.

For other innovations in energy, water, and financial services targeted at improving the lives of the global poor, innovators can find developer talent as well as suitable communities for market testing within South Africa. Creating national competitions on social issues would help attract innovators and focus efforts on solving real problems.

**Strengthen the interface between universities and private-sector companies as well as venture capital firms**

University TTOs are well staffed and well resourced, and highly focused on creating innovations and spin-outs, while supporting university R&D efforts. Though extensive, once innovations leave the confines of the university they can struggle to find the relevant support from the private sector and VC firms.

Cape Town TTO Innovus has built a reputation for managing this interface by developing relationships with private-sector companies and VC firms. These best practices could be used in other parts of the country, by building a network around the TTO based on formal and informal events and collaborations as well as favorable policies and a strong commitment to removing barriers to collaboration.

**Align IP regulation with incentives for IP licensing revenue and new business starts**

The IPR Act assigns ownership of all publicly-funded R&D (including from universities) to the government unless an acquirer of the IP or startup can cover R&D costs. The challenge with this approach is that the exploratory nature of R&D spending means that it could be higher than the fair market value of the innovations it inspires. Companies that seek to acquire startups or IP may therefore be less willing to cover the R&D costs when this is the case.

Amending the law or supporting loopholes could help remedy these restrictions, making startups more attractive to private-sector investors and acquirers. Similarly, the newly-relaxed Exchange Control Regulations for cross-border IP acquisition will be an important driver in whether startups are registered within South Africa, as well as how much foreign interest South African innovations attract. One way to do this is to shift focus to capturing tax on licensing revenues vs. cross-border transfers, which may improve the attractiveness of these startups to foreign investors.

**Create linkages to African markets around innovation, to build pathways for innovation and tech talent**

Creating relationships with specific entities in innovative hubs such as Nairobi, Kigali, and Lagos, could create 'innovation corridors' of collaboration, shared best practices, mutual testing grounds and import-export markets for innovation. For South Africa, this could also create outbound job creation opportunities for developers or other tech professionals to find jobs in other countries to improve their skills. And it also provides a facility for South Africa to attract talented professionals in other countries.

The education sector is an ideal area to start with. Attracting skilled professionals in developing teacher training programs and innovative literacy and numeracy programs for high-poverty areas could help South Africa address education gaps. By nurturing an EdTech specialization and attracting regional experts, South Africa could develop novel solutions to challenges in education.

<sup>51</sup> Tire Business Report. "Thailand building auto test center to support tire, NR sectors". <http://www.rubbernews.com/article/20170113/NEWS/170119971/thailand-building-auto-test-center-to-support-tire-nr-sectors>

# Conclusion

South Africa has made impressive social progress over the last few decades since apartheid ended. The new government development agenda is focused on economic inclusion for all of its citizens and addressing poverty through job creation. Supportive mandates have triggered an outlay of investment and private-sector directives not seen in even the more mature ecosystems. The size of this support has the potential to make South Africa a major contributor to global innovation, but first it must continue to improve the lives of its citizens by expanding access to basics such as education, employment, and ICT services.

Shifting the focus from the number of entrepreneurship programs to their effectiveness will ensure that the aims of these programs are being met, and allow the kind of assessment that identifies truly successful interventions for job creation. And, with more targeted programs aimed at closing the skills gaps in business and tech, the government can help ensure that the new jobs that are created are more sustainable in the long term.

# Acknowledgments

We are grateful to Google for the invitation to write this paper. We wish to acknowledge and express our appreciation to our collaborator EndCode, particularly Pria Chetty and Komeshni Patrick, the directors of the organization and Kavish Naicker for their contributions and support throughout this project.

We also wish to thank all the participants in our interviews for their contributions and valuable insights. All of the interviews were conducted in English and all quotes have been approved by their owners as presented. The usual disclaimer applies.

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# Appendix

## Definitions – Tech entrepreneurship frame of reference

For the purposes of this paper, entrepreneurs are distinguished from self-employed individuals by their motivation to create a rapidly scalable business venture with the aim of innovating, improving, or transforming the given way of doing things.<sup>3,5</sup>

The entrepreneurship domain includes startup and scale-up phases of the business cycle where companies are experiencing high growth in revenues and employees numbers while validating their value proposition and building up.

Technology-driven entrepreneurship bases its business proposition on the use of new technologies as an enabler and focuses on hyperconnectivity among of networks, people, businesses, things, and hardware that’s internet-enabled. Technological applications in conventional sectors and new businesses in emerging sectors fall under its definition.

agents of change who create new value propositions by means of new products, services, innovative processes, and organizational innovations that lead to evolution or obsolescence of current way of things

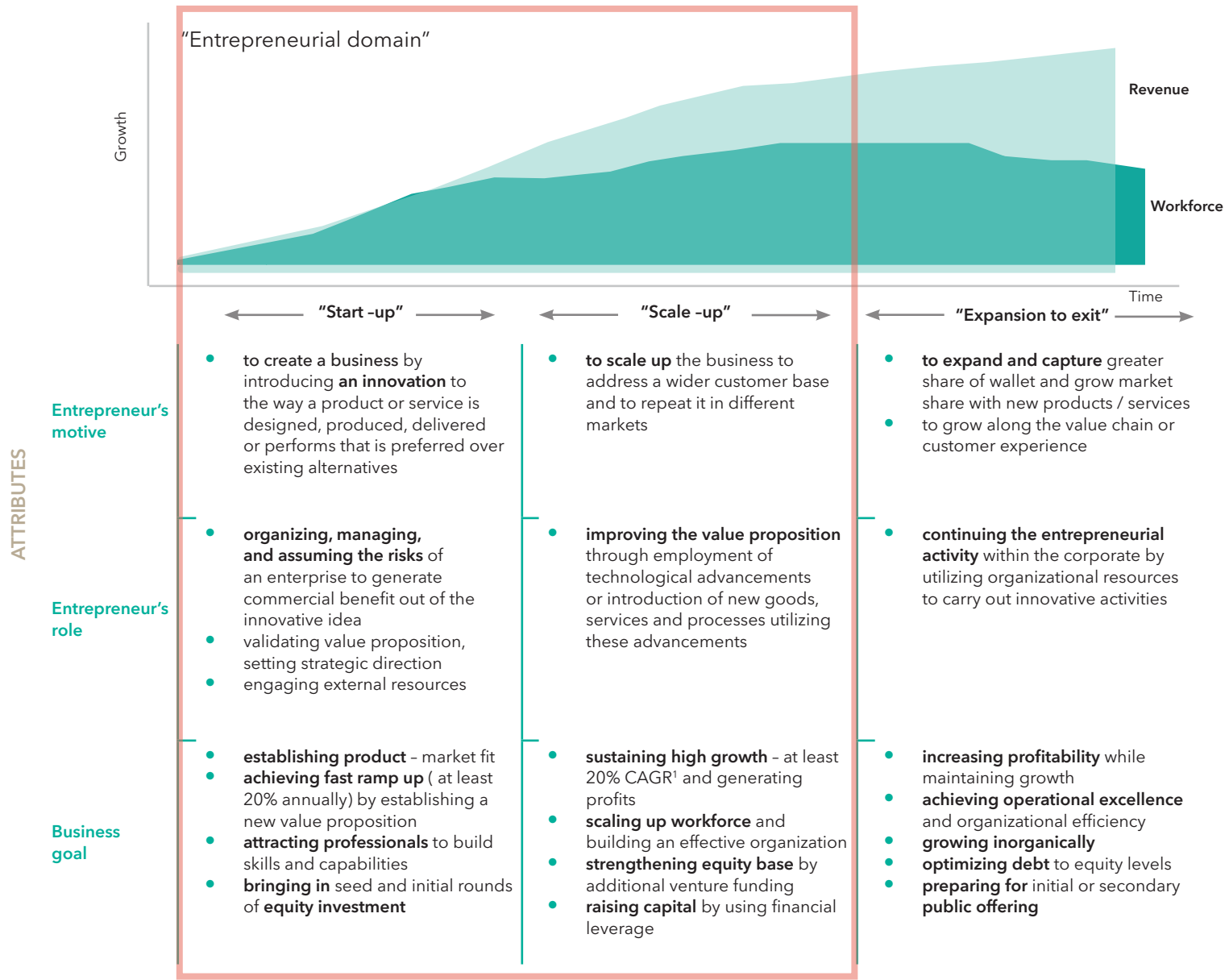
business owners who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets

... different from self-employed individuals who seek to generate income by using existing products, processes or markets

initiators whose business ventures result in the development, growth and well-being of their societies through job creation and level of innovation<sup>2</sup>

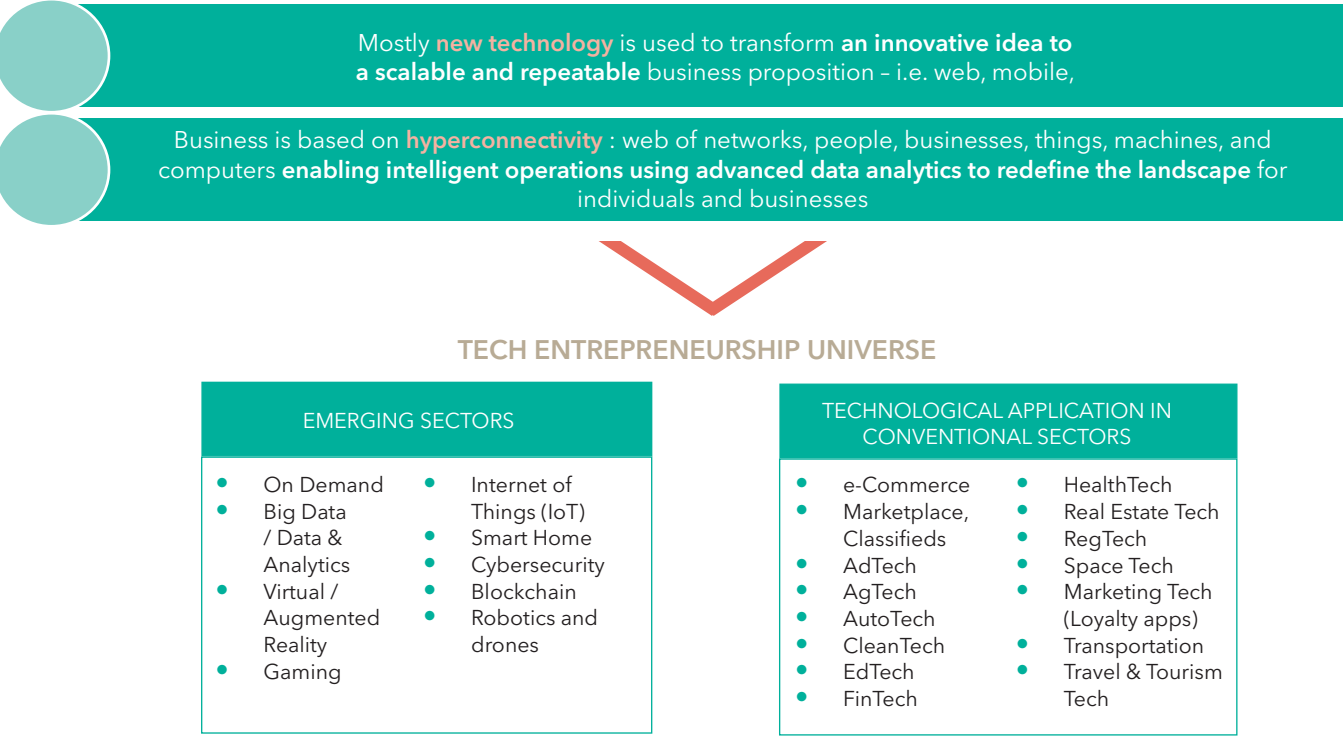


FIGURE I. THE MAIN INDICATOR OF AN ENTREPRENEURIAL ENTERPRISE IS ACHIEVING YEAR-ON-YEAR HIGH GROWTH IN REVENUES OR EMPLOYEE BASE



<sup>1</sup> High-growth Enterprises and Gazelles -Sensitivity Analysis, Ditte Rude Petersen and Nadim Ahmad, OECD 2007  
Source: Global Entrepreneurship Monitor (GEM) Global Report 2016/17, Global Entrepreneurship Research Association 2017

FIGURE II. "TECHNOLOGY ENTREPRENEURSHIP" CAN BE DISTINGUISHED FROM OTHER FORMS OF ENTREPRENEURIAL ACTIVITY



Definitions- Tech entrepreneurship success outputs

Output	Indicator	Definition	Source	Date
Economic Contribution	Tech start up prevalence in the country <sup>1</sup>	Number of active tech start-ups founded after 2010 per million urban population	Crunchbase	2017
	Tech startup longevity	Survival rate of tech startups that were founded after 2010	Crunchbase	2017
	Number of exits over USD 100m	Number of acquisitions and IPOs between 2012-2016 that had a valuation over USD 100 million	Crunchbase	2017
	Entrepreneur's growth aspiration score	A scoring based on percentage of entrepreneurs with a sophisticated growth strategy aspiring to grow at least 50% in the next 5 years and attract VC funding	GEDI	2016
	High job creation expectation	Percentage of those involved in Total Entrepreneurial Activity <sup>2</sup> who expect to create 6 or more jobs in 5 years	GEM	2016
	Ability to create globally recognized "Unicorns" <sup>3</sup>	Number of unicorns is used an indicator of global reach since they operate beyond their local markets and are highly international and large in scale	CB Insights	2017
	Contribution of knowledge sectors to economy	An index to approximate the value of global flows that are linked to knowledge economy: <ul style="list-style-type: none"><li>ICT exports<sup>4</sup>,</li><li>high tech exports<sup>5</sup>,</li><li>international data flow connections</li><li>intellectual property receipts of a country (excluding domestic receipts)</li></ul>	World Bank, McKinsey, INSEAD	2015, 2016
Innovation Creation	Innovative output density	An index on the abundance of knowledge creation (patents, publications etc.) and intangible assets (density of trademark applications, industrial designs, creation enabled by ICT)	INSEAD	2016
	Entrepreneurial innovation creation	Percentage of those involved in entrepreneurial activity who indicates that their product or service is new to at least some customers AND that few/no businesses offer the same product	GEM	2016

1. The urban population of China and India were normalized using the city populations of tech entrepreneurship activity  
2. Total Early-Stage Entrepreneurial Activity measures the percentage of working age population (18-64) both about to set up their businesses and have set up at most 42 months ago  
3. Unicorns are startup companies that are valued over USD 1 billion  
4. ICT service exports include computer and communication services and information services including computer data transactions  
5. High tech exports are R&D-intensive products, which can be found in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery

Disclaimer

This report was prepared independently by OC&C Strategy Consultants in collaboration with Endcode who have both been commissioned by Google to research the tech entrepreneurship ecosystem in South Africa (in addition to other developing countries in the East Europe, GCC and Africa region) to identify policy recommendations to improve tech entrepreneurship. Information provided herein, including policy recommendations are prepared and intended for use as discussion materials on the ways to support the growth of tech entrepreneurship.

The report is based on a variety of inputs from multiple sources including official data sources such as various public institutes and foundations focusing on entrepreneurship, and other privately published data sources such as news articles, sector reports and interviews with tech entrepreneurship ecosystem actors. Recommendations are based on statements of ecosystem actors. Accuracy of analysis and recommendations are dependent on the detail and accuracy of declared data. Parties do not guarantee and are not responsible for the currency, propriety, accuracy or reasonableness of any statements, information or conclusions contained in the source documentation used.

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