

A Hub for Africa? The Information and Communications Technology Sector in Cape Town



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1 Introduction

Services in information and communications technology (ICT) are a critical input into economic development, since unlike any other service they are uniquely able to shift the production possibility frontier outwards over time and enable the better utilisation of scarce resources. In South Africa, the ICT sector has grown in tandem with the rapid expansion of the sector globally—and the level of sophistication of both the hardware and software components of the industry is on a par with the developed world (Gillwald et al. 2012). Cape Town hosts its own ‘Silicon Valley’ hub of ICT firms, collaborative initiatives, funders and governmental partners. The City of Cape Town and the Western Cape Government, together with non-profit partners, have consciously driven the process of developing the sector to the point that it is a continental leader today (Brand South Africa 2014). As a world city, Cape Town is globally integrated both culturally and technologically; it is to Africa that it must surely now look to further leverage development of its ICT sector, however.

This chapter explores the nature and dimensions of the South African ICT sector and within it, the one in Cape Town. For the purposes of this chapter, Cape Town is understood to refer to the greater Cape Town metropolitan area, including Paarl, Somerset West and Stellenbosch. The reason for the focus on Cape Town is that business and software services are the highest value-added ICT activities and these are the ones on which the sector in Cape Town is largely based. The empirical section of this chapter elaborates on the sector’s backward and forward linkages, referring to statistical information obtained from Statistics South Africa and the World Bank. It then presents feedback from a sample of four firms, with a view to understanding the extent of their integration in value chains, their experiences with value-chain governance and upgrading, and the challenges that they face in

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expanding their operations. It is not implied that these case studies are representative of the entire sector. They rather represent four distinct and diverse ones drawn from a survey with a limited distribution. Before coming to the empirical findings, conceptual background information on value chains in the ICT sector and the methodology applied in this chapter is provided.

2 Conceptual Context and Methodologies

The originator of value-chain analysis—Michael Porter—developed the model for the manufacturing industry, but it has since been applied to the services sector too (Choi 2001; Gabriel 2006). The central concept in Porter's (1985) model and that developed in derivative research is that production is not a black box of inputs and outputs, but rather a complex and interrelated set of activities from the conceptualisation of the product all the way through to its final disposal or recycling. This is known as a value chain in the sense that it is an interrelated set of value-generating processes culminating in a finished product (or service).

One valuable insight gained from the description of value chains is the ability to identify areas in the production process where additional value could be generated. Similarly, it allows the chain to be broken down and potentially dispersed to other business units, subsidiaries or even other companies. This dispersion of the value chain is elaborated on further below, since it is of particular relevance to certain aspects of the ICT sector. Applying value chains to the ICT sector would, therefore, seem to a viable and popular research exercise, but there is surprisingly little published research in this area. One notable contribution is that of McCormick and Onjala (2007), who attempt to describe value chains in both the hardware (physical) and services segments of the sector. Since ICT services—such as application or web development—are entirely generated by knowledge workers, the value chain is comprised of stages of services beneficiation such as the following:

- problem assessment and solution conceptualisation,
- initial design (use case model),
- refined design (process flow model),
- application development,
- testing and debugging,
- marketing and distribution, and
- support.

This is just one example of a value chain within the ICT context, and it could be described more complexly if more information were available as to the precise nature of the service. Yet, this chapter will not delve into the nature of the structure of specific value chains within the ITC sector. Its purpose is, rather, to understand the environment around ICT value chains in Cape Town. The approach taken is to follow the primer methodology found in the literature (Gereffi and Fernandez-Stark 2016; Kaplinsky and Morris 2001), where the value-generating environment of a sector is conceptualised in terms of a number of aspects. Once understood, these

aspects provide an essential background to explaining the sector, its challenges and potential to develop:

- participation in global and regional value chains and governance thereof,
- upgrading,
- regulatory environment,
- stakeholders such as industry associations, trade unions and their impact on value generation,
- access to markets,
- access to training,
- access to collaboration and coordination with other industry players, and
- access to finance.

Within every production process that involves the beneficiation of raw materials into a finished product, a chain of input–output ones are involved in adding value to the point that a product is finalised. This conceptual mechanism can be readily understood and applied in the context of physical-goods production but, as noted, it is increasingly being applied to the production of services too. Were the value chains to remain internalised within one enterprise within a single country, they would be of limited interest—and then mainly to the business economist. The fact that they have also become distributed both geographically within a single enterprise as well as across different ones means that they have become of interest to the trade economist.

In the globalised economy, especially with regard to certain ICT services that are hardly affected by physical distance (such as outsourced help desks), developing nations now have an opportunity to enter value chains in a manner that a few decades back would have been simply impossible. Multinational enterprises of varying sizes can optimise their production process by distributing it globally, and so bring down costs and increase efficiency. In the ICT sector, the most obvious form of globalised value-chain practice is offshoring, whereby a component of production is moved to an affiliate in a different country—and possibly a different continent (Abramovsky and Griffith 2006; Bartel et al. 2005). An affiliate of Amazon Web Services (AWS) based in Cape Town is an example of this (more on this later). A related form of dispersion of ICT value chains is outsourcing, whereby production of a component is outsourced to a domestic or foreign enterprise (Huws et al. 2004; Stuart 2015b; Sturgeon and Gereffi 2009). The most well-known example of offshoring and outsourcing in the ICT sector relates to the role played by India in the distributed value chains of many multinational enterprises such as Dell, Hewlett-Packard, Oracle, Schlumberger and Texas Electronics (Business Maps of India 2017; Khan et al. 2003; Walsham 2010).

These new approaches to fragmenting production are not exhaustive, but remain the most common forms found in the ICT sector. The existence of global value chains (GVCs) of these types is undisputed, however regional value chains (RVCs) are less well known in the ICT sector, especially in the case of Africa. Considering that there appear to be major opportunities for Cape Town's ICT sector as a hub for Africa, meaning for RVCs, particular attention is paid to this issue in the empirical analysis presented in this chapter. The first part of this study involves the basic arrangement and presentation of data sourced from Statistics South Africa and the World Bank. Use is made of the Visual Understanding Environment Tool from Tufts

University to present input–output figures for supply-use data. World Bank data used is that from the Export Value Added Database. Both these statistics disseminators use standard data collection and cleaning techniques to ensure data integrity. More information hereon can be found on their respective websites.

The only way currently to source information on the value-chain positioning of a firm is to ask it directly, because there exists no publically available database with this information. For this reason, a survey form was designed using the aforementioned seven features of the value-generating environment. The firms were asked to describe their basic features, the stages of production of their main service, the potential involvement of other parties in the production process and governance, the existence or potential for upgrading and/or extending the value chain of the service, the regulatory environment (if relevant), the main stakeholders and their roles as well as issues with access to market, training, industry coordination and finance. The author then attempted to draw out insights from the responses, and to generalise them where possible. Of the sample of 11 firms approached, only a small proportion responded to the request for feedback (which was by means of Google Forms). There were four responses in total, and by no means is it implied that they are somehow representative of Cape Town’s ICT sector in its entirety. The respondents were not obligated to provide the name of their company. In the event, two of the respondents declined to name their company and two did not. For the sake of symmetry, no company names are disclosed at this point.

3 The ICT Sector in Southern Africa: Linkages and Supply-Use Flows

Services are primarily forward-linked flows of value. In other words, the value streams from services are primarily inputs into the production of other services and goods rather than being themselves finally consumed. The ICT services sector is no exception to this, and is in fact one of the more forward-linked such sectors. Based on calculations regarding data contained in a World Bank (2015) database and reported in Stuart (2015a), the ICT sector has a ratio of forward to backward value added for Africa of 4.5 to 1. This means that for every 1 unit of value absorbed by the sector, 4.5 units thereof are input into other sectors.

This forward-heavy relationship can be better understood by visualising it in a flow diagram. Figure 1 presents regional-export-value-added flows for the business services and IT sectors for the Southern African Development Community (SADC). The figure shows value flows as arrow-headed lines, the weight of which reflect the size of the value flow. As is evident from the figure, the backward linkages (the lines on the left-hand side) are lower-value flows than the forward ones (the lines on the right-hand side). Mining and primary industries, which make up seven of the top ten export sectors in SADC, are important buyers of IT services as well as machinery (also in the top ten) and chemicals.¹ This pattern is due to IT services’ nature as

¹These trade patterns can be verified by using data from an online portal such as: <http://www.trademap.org>.

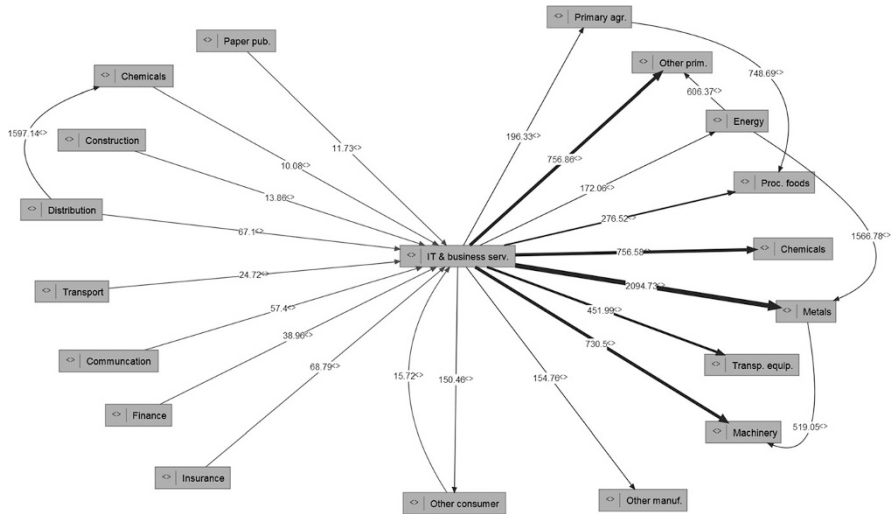


Fig. 1 SADC export value added in IT business services. Source: Author’s own compilation, based on data from the World Bank (2015)

generic back-office ones rather than as specific services—such as mining engineering or research chemistry.

The importance of the ICT sector as a provider of intermediate value can be further explained by visualising the supply-use flows for the sector. This data is not the same as the export-value-added data provided by the World Bank, which shows the linkages between goods and services industries. Although the database is referred to as the Export Value Added Database, it contains two matrices—one of them focussed on export value added and the other on value added to domestic production. The supply-use tables published by the South African Statistical Service (or Statistics South Africa) show the linkages between an industry and the type of upstream or downstream activities linked to the industry. These tables are accounting in nature, in that the total of supply items should balance with the total of use items.

Figure 2 visualises the supply-use relationship for the South African ICT sector in aggregate. The sector’s role primarily as a supplier of intermediate goods and services is evident from this figure, with intermediate usage of the ICT sector’s output at 63%—as against only 24% used by domestic households. Imports are also very important, accounting for 31% of the value of inputs into the sector, with domestic output at 61%. By contrast, exports are only 8% of the usage of the domestic industry’s output. The sector can, therefore, be characterised in aggregate as an intermediate industry with high import content.

The ICT sector can be disaggregated into six sub-sectors, as presented in the left-hand column of Table 1 below. Salient features of the supply-use relationships for these sub-sectors are presented in the same table. Figures 3, 4, 5, 6, 7 and 8 show supply-use data for these six sub-sectors. The data has been visualised in the same way as for Fig. 1 above. It is evident that the service-based sub-sectors are quite

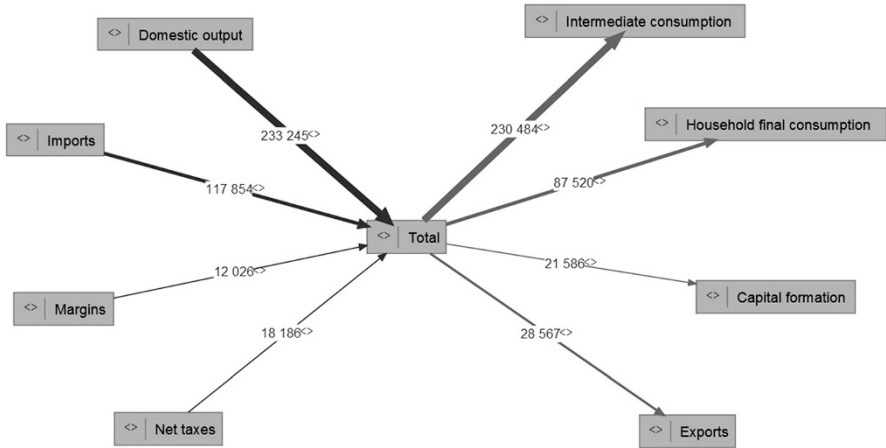


Fig. 2 Supply-use flows for the South African ICT sector (Total). Source: Author’s own compilation, from data in Statistics South Africa (2017). Note: Margin means the difference between revenue and the cost of sales plus overhead. Net taxes are the effective tax liability of the sector

Table 1 Supply-use characteristics of six South African ICT sub-sectors

Sub-sector	Characteristic features
Office, accounting and computing machinery	Imports account for 76% of inputs
	Output destined for intermediate uses is nearly double that for final consumption
	Highest percentage of capital formation of any sub-sector at 61%
Radio, television and communication equipment	Imports are 61% of inputs
	Share of output to intermediate use is 73%, final consumption only 18%
	Exports are only 5% of output
Miscellaneous ICT components and goods	Domestic output is 55% of input into this sub-sector
	Share of output to intermediate use is 76%, final consumption only 6%
	Margins are relatively high for this sub-sector, probably due to lower reliance on imports
Leasing or rental services without operator	99% of inputs into this sub-sector made up of domestic output
	93% of output to intermediate uses, only 7% to final consumption
Other professional, technical and business services	Imports are only 5% of inputs into the sub-sector
	Exports are only 6% of output, making this a largely domestic, non-traded sub-sector
Telecommunications, broadcasting and information supply services	84% of inputs are sourced domestically
	56% of output is to intermediate uses, 34% to final consumption

Source: Author’s own calculations, based on Statistics South Africa (2017)

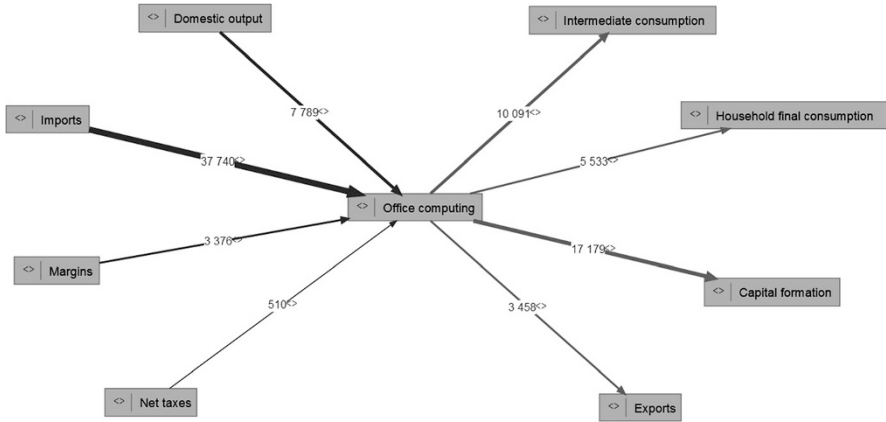


Fig. 3 Supply-use flows for office, accounting and computing machinery. Source: Author’s own compilation, from data in Statistics South Africa (2017)

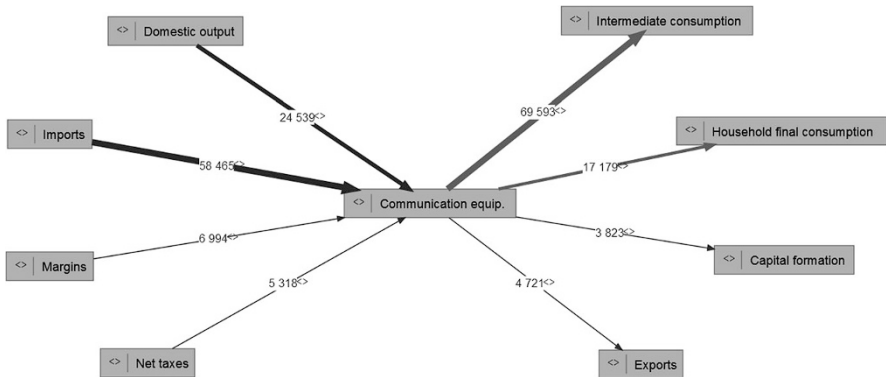


Fig. 4 Supply-use flows for radio, television and communication equipment. Source: Author’s own compilation, from data in Statistics South Africa (2017)

different from the goods-based ones; these important differences are lost when considering only the aggregate data. Notable features of some of the sub-sectors are:

- Leasing or rental services without operator: Since this sub-sector involves leasing and rental of equipment, its supply-use structure is unique. It is based almost entirely on domestic output and domestic business consumption.
- Other professional, technical and business services: This sub-sector is service-based and highly focussed on intermediate demand. Intermediate consumption is 92% and final consumption is only 2%. Unlike leasing services, however, it does have a small import component.
- Telecommunications, broadcasting and information supply services: This sub-sector is also service-based but a little more traded internationally than the previous sub-sector. Imports and exports are both approximately 10% of total

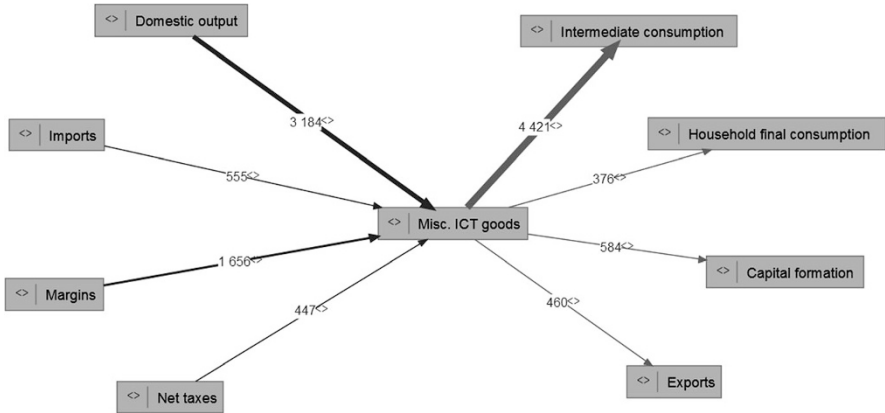


Fig. 5 Supply-use flows for miscellaneous ICT components and goods. Source: Author’s own compilation, from data in Statistics South Africa (2017)

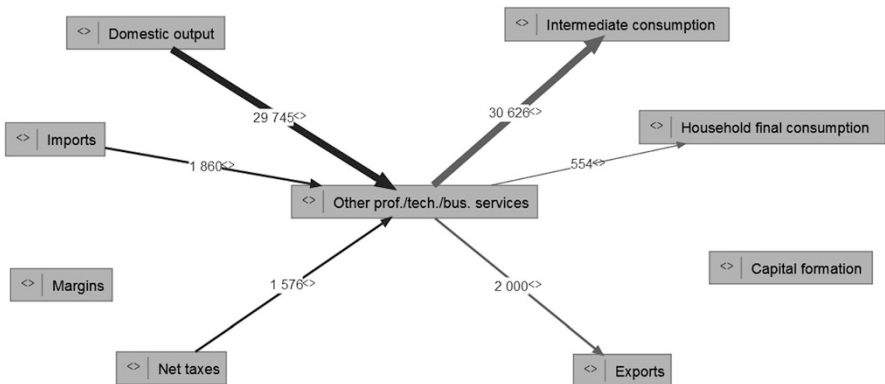


Fig. 6 Supply-use flows for other professional, technical and business services. Source: Author’s own compilation, from data in Statistics South Africa (2017)

input and output respectively. The sub-sector is also more geared towards final consumption than the previous two sub-sectors.

Figures 3, 4, 5, 6, 7 and 8 also suggest that within South Africa, the ICT sector’s main supply category is domestic consumption, followed by imports. The main uses of the sector go to intermediate consumption (business to business, or B2B), with final consumption being only about one-third of the value. The service-based sub-sectors are different from the goods-based ones: the latter are mostly involved with importing equipment and supplying it to intermediate and final users, whereas the former primarily generate value from domestic skills and supply it to intermediate users.

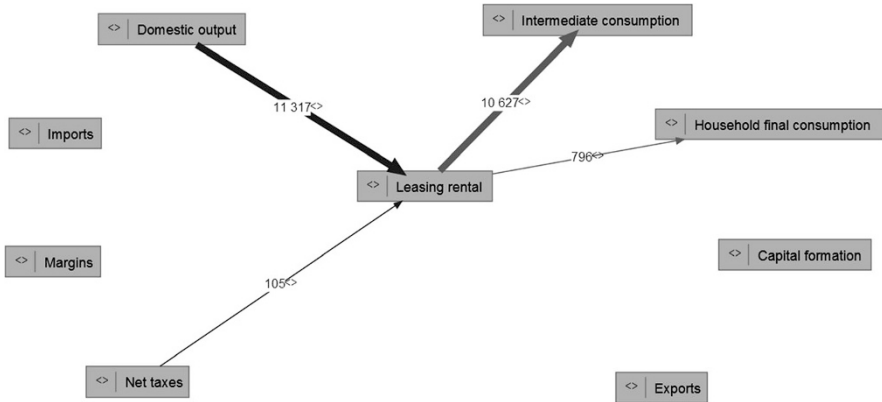


Fig. 7 Supply-use flows for leasing or rental services without operator. Source: Author’s own compilation, from data in Statistics South Africa (2017)

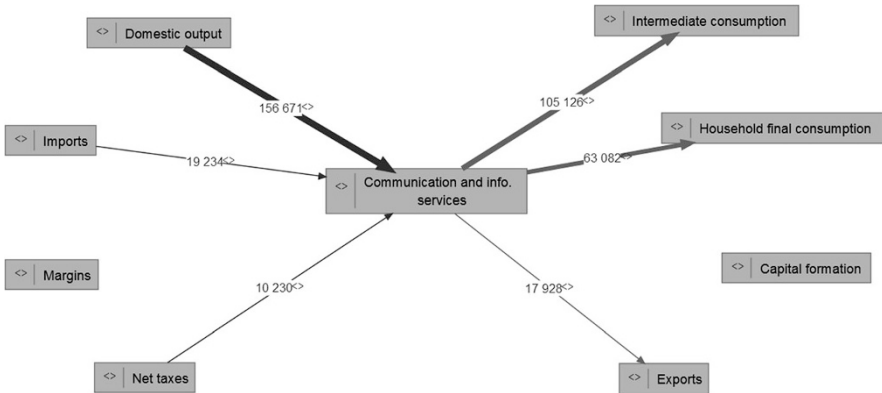


Fig. 8 Supply-use flows for telecommunications, broadcasting and information supply services. Source: Author’s own compilation, from data in Statistics South Africa (2017)

4 The ICT Sector in Cape Town: Outstanding Firms and Survey Results

‘If you’re launching a tech start-up in Africa, [Cape Town] is the place to be. It is the most mature economy in terms of tech support, so to be part of that community and that hub and that wave was very important for us.’ Thatoyaona Marumo, chief operating officer of Domestly (quoted in City of Cape Town 2017: 3)

Cape Town has a well-documented pedigree as an investment city for ICT in South Africa. It is the location of choice for tech investors and start-ups for a number of reasons. The city is a hub of technology companies, ranging from micro start-ups in the drone-data industry such as Aerobotix to outsourced sub-divisions of massive

multinationals such as AWS. Cape Town provides a large talent pool of diverse skills, fed into by a number of high-quality tertiary institutions. It is also a concentration of venture capital and angel investors focussed on the sector.² Public institutions actively encourage the ICT sector, and there is a network of support services such as fibre connectivity and strong infrastructure (Carstens 2013; Wesgro 2013). This set of characteristics has contributed to historical and forecast growth for this sector, which eclipses that for any other services sector in the Western Cape (shown by Fig. 9 below). The strong technology sector presence in Cape Town has given rise to several initiatives to encourage collaboration and networking among market players. The most prominent of these are listed in Table 2.

Of these initiatives, only CITi has included the development into Africa as part of its mission. The creation and fostering of RVCs is not a specific prerogative of any of these entities, which are instead focussed on developing the hub that is already established in the Cape. However before regional collaboration can become a reality, sector development in African countries has to progress to a certain level. This requires investment of both human and financial capital, and one way this technology transfer takes place is by foreign direct investment (FDI).

When examining data for FDI into the ICT sector in Africa, it is obvious that South Africa is the primary destination herein—attracting 204 projects, or 22% of the total number of them between 2003 and 2014. Johannesburg is the top-ranked

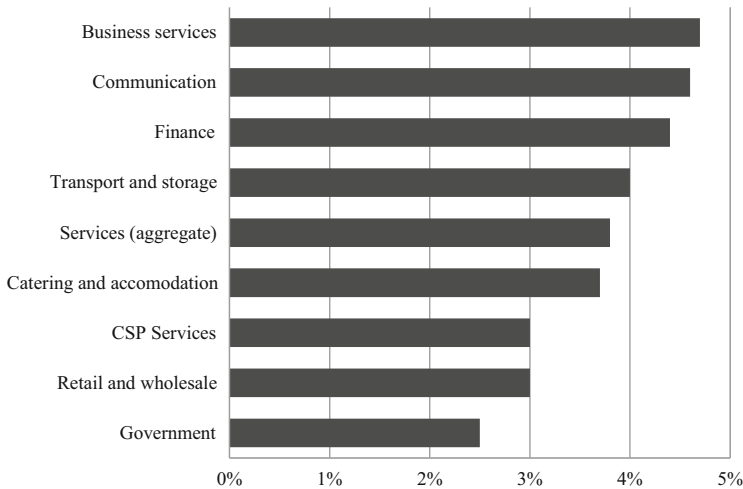


Fig. 9 Forecast growth for the services sector in the western cape. Source: Western Cape Government (2013). Note: Data is per year for 2013–2018. The category of business services in this figure includes computer services. CSP refers to community, social and personal services

²An angel investor, also known as a business angel or seed investor, is an affluent individual who provides capital for a business start-up, usually in exchange for convertible debt or ownership equity.

Table 2 ICT sector collaborative initiatives in cape town

Name	Website	Description
Cape IT initiative (CITi)	www.citi.org.za	non-profit organisation tasked with developing an IT hub in the Western Cape and further afield into Africa; bridges between government and the private sector
Bandwidth Barn	www.bandwidthbarn.org	subsidiary of the CITi, an IT business incubator; supports ICT entrepreneurship in the Western Cape and has graduated more than 50 businesses
Silicon Cape Initiative	www.siliconcape.com	non-profit organisation with 4000 members; focussed more on awareness-raising and public relations than on business incubation; dedicated to establishing the local IT sector as a world-class IT hub in Africa
South African Business Link to Experts Accelerator (SABLE)	www.sablenetworks.com	international group that helps entrepreneurs and innovators commercialise technology and access markets
InnovUS	www.innovus.co.za	Stellenbosch University company for technology transfer and commercialisation, development and support of technological innovation; supports staff and students of the university

Source: Wesgro, City of Cape Town and PwC (2013)

city for inward FDI, with Cape Town ranked sixth, receiving 30 projects for this period. South Africa also contributed most outward FDI investment into Africa (compared with other African countries), initiating 65 projects from 2003 to 2014. The majority of FDI projects into Africa were capex-based and involved communications infrastructure. Software and IT services accounted for approximately 30% (Wesgro 2015). Western Cape outward FDI into Africa is primarily based around services—software and business services, to be precise—with the category of communications technology only ranking sixth out of six. This reflects the fact that the Western Cape is more focussed on software and business services than Johannesburg, which is more geared towards communications: the mobile communications company MTN is the top South African investor in Africa. Interestingly, for the period from 2003 to 2014, there was more outward FDI from the Western Cape into the rest of Africa than the reverse, and the investment from Africa into the Western Cape was based around the communications sub-sector (Wesgro 2015). This shows that, unlike the developed world, Africa has not yet leveraged the business and software services strengths of the Western Cape ICT industry.

To better understand the nature of the Cape ICT sector, it will be worthwhile to briefly survey the leading companies in the sector since these essentially define the sector. Their successes and innovations are reflected in many of the smaller, satellite ICT businesses that share their environment. The following paragraphs draw primarily on a joint publication by Wesgro, the City of Cape Town and PwC (2013).

- Naspers is primarily a media-technology company, providing, for instance, digital-pay television. It also owns the massive Tencent messaging platform in China, and has interests in e-commerce, advertising and content provision. Naspers is a multinational company with investments primarily in other emerging markets (both BRICS and Africa), indicating an ability to identify opportunities and take risks. It has bought existing businesses and has actively expanded South African-grown ones such as Kalahari.net into Africa.
- Fundamo is a multinational company founded in Cape Town. It is a mobile-payments facilitator to the unbanked sector in the developing world, both Africa and Asia. In 2011, it was acquired by the multinational payments giant Visa.
- Clickatell is a mobile-messaging enabler to private sector and governmental entities. It enables custom messaging platforms to be developed to facilitate communication between entities and their clients. It is heavily Africa-focussed, with multiple clients across the continent.
- ACI is the ultimate owner of a Cape Town start-up—Mosaic Software—that created an electronic payments enabler called Postilion in the late 1990s. The system is now one of the top four global payments providers with presence in Africa, the Asia-Pacific region, Europe, the Middle East and the United States.
- AWS is a hardware and software service provider to a wide array of companies, from micro-enterprises to huge multinationals like Instagram and Netflix and even public organisations like the National Aeronautics and Space Administration (of the US). AWS has a developer support team based in Cape Town, and this operation has shown steady growth since its inception in 2005 as the Cape Town Amazon Development Centre.
- Entersekt is a payments-authentication service aimed at the mobile-phone platform. The software allows users to authenticate communication directly between their mobile phone and their banks' servers. A Cape Town-spawned business, Entersekt, has grown since its inception in 2008 to a point where it has branch offices in the United Kingdom and US.

These firms are a sample of the leading firms in the sector. All of them are internationally integrated, most as parent companies or original parent companies. Only one—AWS—is a subsidiary of a larger global enterprise. This demonstrates the extent of innovative and creative talent in the sector in Cape Town. It attests to the effectiveness of private venture capital funding in the sector. Given the international profiles of these firms, it would be valuable to understand the extent of their participation in global or regional value chains but corresponding data is not freely available. The following paragraphs now present data from the aforementioned survey of four Cape Town-based ICT companies in order to better understand the nature of value chain-participation.

The responses that were received to the survey template provide raw feedback from each of the four unique firms. Each produces a different service and only one—company 3—is primarily focussed on the domestic market, on web development to be precise. The other three are international companies either in terms of their client base (demand side), global integration of their production (supply side) or both. This

represents an interesting cross-section of enterprises, even though it is not possible to say to what extent they are representative of the rest of the industry. In order to draw out common threads, to the extent that they are even present, a summary of results by theme is presented next.

Of the four firms, only one—company 2—is integrated into a third-party value chain, and this is a GVC rather than a regional or local one. There was no evidence of regional or local value chains in the sample. The firm integrated in a third-party value chain is the youngest and smallest of the sample, and this could mean that in the longer term it would be motivated to extend its production process so as to absorb the component that is now contributed by a third party. Also notable is that company 2 is the lead firm in the value chain, in that it is responsible for around 75% of the production process and maintains governance of it in its entirety.

Three of the firms in the sample have been involved in upgrading their service offering over time, two of them strongly so. This includes company 2, implying that at one point in the firm's life it was not the lead firm in the production process. Furthermore all firms identified the need to continue to advance up the value chain, in the sense of producing a more sophisticated service that embodies higher-skilled labour and more specialised resources. In fact, this is not only desirable but essential in the ICT sector—to avoid redundancy. More so perhaps than with any other sector, to fail to progress in the ICT sector is to regress rather than merely to stand still (Gibson 2017). Only one of the firms has entered a new value chain over the course of its life, but three have extended the scope of their production processes to cover more of the value chain over time. The only firm that has not upgraded is company 3.

The responses to questions on the regulatory environment were as diverse as the companies included in the sample. In terms of local legislation, company 2 felt hindered by the Financial Intelligence Centre Act (FICA) and the Financial Advisory and Intermediate Services Act (FAIS)³; company 1 by the Independent Communications Authority of South Africa (ICASA) and the Protection of Personal Information Act (POPI) meanwhile.⁴ Company 4 mainly serves the US market and so is not affected by South African legislation, at least within the delivery of its service. However, this firm's response did indicate that unfamiliarity with the sports media establishment in the US and corresponding policies did impact on them.

Two of the firms cited venture capitalists as their most importance stakeholders, indicating the sensitivity of the sector to funding availability. The ICT sector itself is only a few decades old, and this is very young compared with other services sectors such as finance and transport. In addition, the industry is volatile—with a rapid rate of redundancy and the keen presence of bubbles. Funding support is therefore critical, especially for younger businesses and those operating in more contested

³FICA deals with money laundering and tax evasion and FAIS with consumer protection on insurance products. Both increase the regulatory compliance burden with regard to payments processing, especially international payments.

⁴ICASA is a regulatory body in the communications sector. It has been accused of gross inefficiency and poor management practices. POPI prescribes much stricter requirements for the management of online personal information.

markets. Access to training was not cited as an issue by any of the companies, confirming earlier points made about the quality of tertiary education and training providers in the Cape Town area. Two of the companies noted that self-training is possible simply through accessing online resources.

Three firms in the sample are primarily B2B focussed; one firm exclusively business to customer (B2C) focussed. Market access issues are diverse, with stiff competition being a problem for the B2C firm, while the B2B firms face challenges with direct marketing (referrals being more successful). Information asymmetries were also cited—whether on the part of the firm about the market (company 2) or on the part of the client about the service offering (company 4). This is interesting given that we are living in the information age; however, it has sometimes been suggested that there is too much information now, leading to diminishing returns and the excessive need to search for what one is looking for.

With regard to access to collaboration and coordination with other industry players, company 2, which provides software as a service (SAAS) and is involved in the application programming interface (API) business,⁵ noted that: ‘Being in South Africa, we are not close to the global tech hubs and the tech communities that develop there. South Africa is too small to have significant communities focussed on specific technologies’. This is interesting because none of the other respondents made a point along these lines. This younger, more globally integrated firm is clearly aware of being somewhat isolated in South Africa. This could indicate pressure towards more concentration of the global ICT sector, to Silicon Valley in the US for example, suggesting that as advanced and vibrant as the ICT sector in Cape Town is, its role as a small satellite of the global sector is not surmountable without significant market penetration above the current level. This is where the potential of the African market becomes significant. If Cape Town’s ICT sector can continue to draw on the global sector and remain at the cutting edge technologically, it could find the regional market opening up to it in the near future—with the benefits of economies of scale and scope allowing the sector to grow to the point where it is a major, not minor global player.

For such a growth strategy, access to finance would be critical. Yet, two of the companies had a similar criticism of the local venture capital market: according to them, South African investors are mainly interested in going concerns and are not, therefore, true venture capitalists at all. Company 4 compared this with the US, where venture capitalists are—from that company’s perspective—more interested in investing in potential growth in value than in current cash-flow performance. Furthermore, it was criticised that, in South Africa, the typical quantum of funding is not sufficient to seed a business and that low-growth, stable companies are given preference over riskier potential stars. It becomes clear from the survey that at least

⁵Providers of SAAS sell a continually benefited application platform to clients. For example, Windows 10 is such a product. Its licensing rights include regular beneficitation of the operation system application. An API is a software tool that allows clients to develop their own software modules to uniquely access and manipulate the data marketed by the service provider.

one firm—company 3—has completely bootstrapped itself and sees no need for venture capital funding. As impressive as this is, for every firm that makes it against the odds many more potential success stories never see the light of day due to poor financial and regulatory support.

5 Conclusion

This chapter has examined the ICT sector in Cape Town within the broader context of the South African ICT sector. This sector is primarily forward-linked with respect to other industries, playing a very important role in the main production sectors in SADC and South Africa: chemicals, machinery, metals, transport equipment and primary production. Within South Africa, the sector's main supply category is domestic consumption, followed by imports. The main uses of the sector go to intermediate consumption (B2B), with final consumption being only about one-third of the value. The service-based sub-sectors are different from the goods-based ones: the latter are mostly involved with importing equipment and supplying it to intermediate and final users, whereas the former primarily generate value from domestic skills and supply it to intermediate users.

Cape Town's ICT sector is a globalised and leading services sector in Africa. Many firms in the sector—not just the large multinationals—have international clients, financiers, investors, partners and suppliers. The sector is more than the sum of its parts, because it rests on a localised hub of diverse enterprises, financier support, a skill pool, local and provincial government support, as well as a strong physical infrastructure. It is the fastest-growing services sector in the Western Cape. Despite the commercial presence of some of the larger ICT enterprises from Cape Town in parts of Africa, when it comes to investment the sector is relatively isolated from the rest of the continent, with little exchange of FDI with the region. This suggests that, unlike the developed world, Africa has not yet leveraged the business and software services strengths of the Western Cape ICT industry.

The empirical section of this paper presented the results of a survey taken by a sample of four ICT firms from Cape Town. These case studies are not necessarily representative of the industry, but the sample is relatively diverse and the results do offer some relevant insights:

- The youngest and smallest of the firms is the most globally integrated in terms of its value chains.
- Funding was cited as one of the most important success factors. Two of the companies took issue with the local venture capital funding sector due to its emphasis on stable cash flows over growth potential. They also pointed at insufficiencies regarding the quantum of funds typically available.
- Market access issues appear to be caused by information asymmetry, both among potential clients and with the firms themselves.

- Despite the perception of Cape Town as a leading ICT sector hub, at least one company finds the local sector to be too small to generate a collaborative impetus in the area of their speciality.
- Only one firm has been established by bootstrapping, and it appears to be the least aware of the importance of value chain-upgrading.

Cape Town's ICT sector is without doubt the leading such sector in Africa, and probably one of the leaders in the Southern Hemisphere. Since many of its firms are already relatively advanced, there is probably far less scope for value chain-upgrading than in other local sectors such as agriculture or mining. However, the sector has the potential to play a leading role in Africa and the broader Global South through collaboration and technology transfer. In order for its potential to be realised, the funding model available to dynamic and cutting edge micro-enterprises and small enterprises has to be revised to make it more relevant and helpful to this local industry.

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