



The University
Technology Fund

FUND

The University Technology Fund

A unique early-stage Venture Capital Fund focused on
IP originating from leading SA Universities



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Executive Summary

Universities have a threefold mandate: teaching (the transfer of existing knowledge to students), research (the creation of new knowledge), and community service (including *inter alia* to industry). Universities, as the main source of new knowledge, are regarded as having an obligation to assist in the creation of wealth and jobs in the knowledge revolution through the effective transfer – from academia to industria – of the results of research performed at universities, and the commercialisation thereof. Universities have become a major driver of economic growth in developed countries.

To facilitate the transfer of intellectual property (IP), most universities have established TTOs (Technology Transfer Offices). Although functioning effectively, they suffer from a number of challenges, these being fragmentation and funding, a sub-critical mass and size to compete internationally, and underfunded mandates. Since the introduction of the *Intellectual Property Rights from Publicly Financed Research and Development Act, 2008*, all SA universities are required by law to discover, protect and commercialise their intellectual property arising from research.

The present landscape presents the opportunity to consolidate the technology opportunities generated by a selection of research-intensive South African universities by establishing a common dedicated venture capital (VC) fund between them. The proposed University Technology Fund (UTF) will present a compelling investment case as it will have preferential rights to evaluate commercial investment opportunities emanating from these universities. It can – once operating successfully – be extended to other universities and HEIs across South Africa, and even Africa.

The universities that are lined up as potential founding universities are Stellenbosch University (SU), University of Cape Town (UCT), University of the Witwatersrand (Wits), University of the Western Cape (UWC), University of Johannesburg (UJ), Nelson Mandela Metropolitan University (NMMU), and Cape Peninsula University of Technology (CPUT).

Many researchers establishing start-up companies to commercialise IP emanating from their research fail due to inexperience and a lack of understanding of the complex innovation cycle and process beginning with research outputs, through prototype development, product design (engineering and industrial design), industrialisation, financing, quality assurance, to production and marketing. A further problem is the lack of early, competent and coherent support due to the absence of private capital in the seed-stage technology investment phase, and the absence of seed capital to move technical opportunities from

the laboratory to the VC door. Government-based initiatives are similarly underfunded. The Technology Innovation Agency (TIA) requires proof of concept at an early stage, which the innovation entrepreneur is often unable to provide due to a lack of experience and initial funding. University TTOs do not have the funds available to develop technologies to VC-funding readiness. The ideal funding model should enable the TTO to provide incremental or “drip funding” to a new technology as it is developed (preferably within a dedicated on-campus incubator), which will prevent premature company formation and ensure that technologies are production-ready before leaving the protective environment around the incubator.

The proposed UTF will provide early-stage and seed funding administered by the TTO, to ensure that a strong pipeline of investment-ready technologies is made available for more traditional, VC-style investment. In return, it will secure preferential rights to that pipeline, and will share in the ownership rights negotiated by the TTO.

The UTF aims to combine the strengths of top founding universities to raise a single “umbrella” fund of funds that will feed into independent university funds – one “Institutional Fund” (IF) per qualifying university. In this manner, the UTF will provide the platform for investors to invest in the technology output of all the participating universities, spreading and reducing the risk. Each university can increase its participation in its dedicated IF by raising further investment in the fund. This initiative will thus create a very strong pipeline of technologies from South Africa’s top universities towards a single fund, the UTF.

Participating universities are required to have a TTO with suitable resources to administer the development of IP to the point of investment readiness, provide an incubation infrastructure (to reduce the early-stage risks involved with new spin-out companies), and an acceptable standard governance framework for all new spin-out companies. IFs will invest only in IP or technology-based spin-out companies arising from the activities of their associated university. A key aspect of the IF’s investment mandate is that a portion of the IF’s assets (“the Development Allocation”) will be made available to the university’s TTO to manage and to fund the incubation and prototyping activities across the development stage. The remaining and bulk portion of the IF’s assets (“the Investment Allocation”) will be managed as a traditional VC fund by the fund manager, under the supervision of an investment committee. This unique funding model is fully suited to the university technology environment and enables the university to bridge the funding gap, and provides venture capital investment in its spin-out ventures as a complete turnkey funding solution.

Executive Summary

The Development Allocation within each IF is not a grant or philanthropic investment in the TTO, but is in keeping with the overall commercial focus of the IFs, and provides development/seed funding to inventors based on sound business practices, in return for a share of the technology and any associated businesses. The TTO will supplement the Development Allocation with funding from various other sources for projects. This reduces the risk on this portion of the fund.

The IF will obtain preferential rights to invest the Investment Allocation in any opportunities funded out of the Development Allocation. TTOs will charge very low or no management fees as their infrastructure and human capital expenses are already covered by the academic institution. A maximum of R10m can be invested in any one investee company. No gearing (i.e. borrowing) at the UTF or IF level is allowed. All income and funds received from the realisation of assets are to be distributed to the investors, and co-investment by other funds and investors in underlying spin-out companies is allowed. Limited partners in the UTF will have the first right of refusal to make follow-on investments in the UTF portfolio companies.

The UTF will be established as an *en commandite* (or limited) partnership of the founding universities, with a targeted fund size of R400m, a minimum investment of R1m, and an expected return of 20%–30% before fees. It consists of a general partner, who will manage the affairs of the UTF, and various limited partners (the investors in the UTF). An investment committee, comprising representatives of the general partner, the limited partners, the universities and independent industry experts will provide input on fund-related matters, resolve any conflicts, monitor performance of the general partner's duties, monitor the UTF's investments and decide how to allocate the UTF's capital.

Each IF will be an *en commandite* partnership with the overarching UTF as a limited partner (and most likely the single largest investor), will have a targeted fund size of R80m–120m with an investment allocation of 80% of committed capital and a targeted investment per investee of R5m–R10m, with typically 15 investees (20 max.). The university itself and/or its alumni will be entitled to invest in and act as limited partners. The general partner will be a company established by the relevant university's TTO, and staffed with representatives from the TTO and others. Each IF will have an investment committee which will *inter alia* review and make recommendations in relation to the investments that the general partner proposes for the IF, monitor the performance of the general partner's duties, monitor compliance by the general partner with the IF's mandate, and resolve conflicts of interest where these may arise between the IF and the general partner.

The UTF will enable universities to

- have available committed funding to commercialise its research and development outputs,
- be able to develop and commercialise their patented research on an ongoing basis,
- assist graduate entrepreneurs to successfully develop their innovations to the commercial phase,
- encourage cross-collaboration between universities,
- attract students and academics,
- support job creation for the universities' graduates and
- contribute to the knowledge economy.

Ultimately, the UTF will anchor universities as drivers of the knowledge industry and create national wealth and jobs in accordance with international developments in the higher education sector.

Introduction

Leading international universities are not only characterised by the number of world-class researchers they employ or by the number of graduates they produce, but also by the contribution they make to society and the broader economic environment.

What distinguishes these universities from others is their ability to provide effective solutions to real-world problems, whilst reaping the benefits associated with this approach. They accomplish this by employing people with vision, by supporting continued innovation and by effectively transferring technology and intellectual property to various stakeholders in a bid to make a positive change to society's paradigms as well as the broader economy. In this context, universities have both the capability and the responsibility to act as societal pivot points for progress, innovation and eventual change.

The commercialisation of a university's knowledge base via technology transfer is thus regarded as integral to the university's responsibility with respect to community service and economic development.

Since the introduction of the IPR Act¹, all South African universities are required by law to discover, protect and commercialise their intellectual property (IP). In 2016, we find ourselves with a substantially professionalised national Technology Transfer (TT) community of practice, despite the challenges which remain, the largest of these being fragmentation and funding.

Despite excellent relationships, the university Technology Transfer Offices (TTOs) are still operating within their own institutional silos, in many cases struggling to overcome the unfunded mandates which arise in developing laboratory technologies into commercially viable products. In addition, no single university in SA has the ability to present a technology pipeline of sufficient size to compete internationally. The result of this fragmentation is also, indirectly, that it is difficult for any one university to raise sufficient funding to commercialise the intellectual property that it generates.

The fragmentation and funding constraints referred to above nevertheless present a significant opportunity, namely, to consolidate the technology opportunities generated by a group of leading South African universities and to establish a dedicated venture capital (VC) fund focused around them. This fund, the proposed University Technology Fund (UTF), will present a compelling investment case as it will have preferential rights to evaluate commercial investment opportunities emanating from these universities. Once proven, the UTF can readily be extended to other universities and higher learning institutions across South Africa.

This document sets out the commercial rationale for establishing the UTF, with reference to international precedent and research, and outlines the salient terms on which it is proposed the Fund will operate. The UTF is also aligned with the National Development Plan for 2030. The Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality and also the United Nation's sustainable development goals (SDGs).

Once implemented, the UTF will mark a significant milestone for the country's innovation ecosystem, the relationship between the universities and the private sector will be substantially strengthened, and investors will have captured an important emerging South African asset class.

¹ The Intellectual Property Rights from Publicly Financed Research and Development Act, 2008 became law in August 2010.



A new landscape

A new landscape

The role of universities across the globe is changing. **Figure 1** below illustrates the typical evolution of a university. In this context, many universities start as teaching universities, delivering graduates to society. After a number of years, the focus is shifted to a more research-oriented approach and apart from graduates, research papers became an important output of the institution.

At the turn of the previous century, innovation became an important strategy globally and patents were added to the list of institutional outputs. In this regard, the university also became more attractive to entrepreneurs.

The next step is for universities to become the central players in a knowledge region, as is evident from developments around leading global universities in Leuven, Oxford, Cambridge, Boston and Finland. At these institutions, the boundaries between the university and broader society have become increasingly blurred, especially in relation to the creation of specific technology industries where the university plays an important role in the establishment of an entrepreneurial ecosystem.

Silicon Valley is another well-known and aspirational example of how two academic institutions, namely Stanford University and Berkeley University, played a major role in the establishment of a knowledge region.

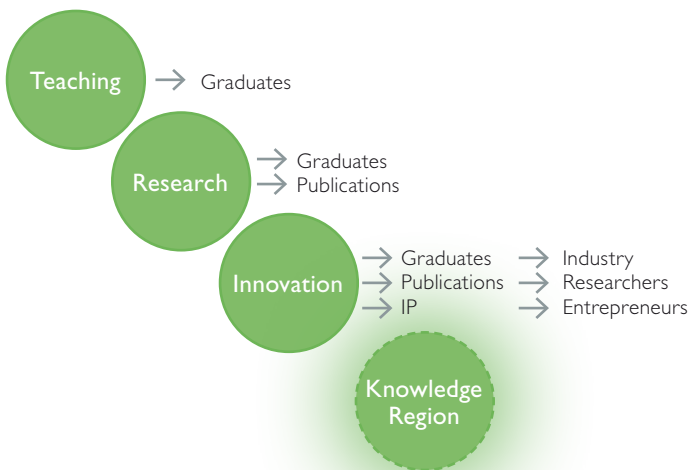


FIGURE 1: THE CHANGING ROLE OF UNIVERSITIES

Using Leuven as an example, it appears that the first step in the establishment of such a knowledge region is for a critical mass of spin-out companies in a specific industry to emanate from universities in the region. This rapid start-up creation attracts entrepreneurs from outside the university who set up shop among the new university spin-outs. Venture capitalists and angel investors soon join the activity. Infrastructure, in the form of business incubators and service providers to start-ups, often follows soon after the increased start-up activity in a region.

When government gets involved, their role often centres around the establishment of and support for technology platforms to support the clusters of new companies in a specific technology space.

Strong networks develop among the stakeholders in such a region and soon large multinational companies set up a presence in the region to acquire new technologies and innovations and to buy young technology companies. These established and large companies often also invest research funding in the university that acted as the facilitating agent for the new technology clusters. In turn, this leads to more innovation and technologies being developed at the institution. In many cases, science parks are established and subsequently knowledge regions are created when clusters of new technologies develop in a region. The process is illustrated in **Figure 2** below:

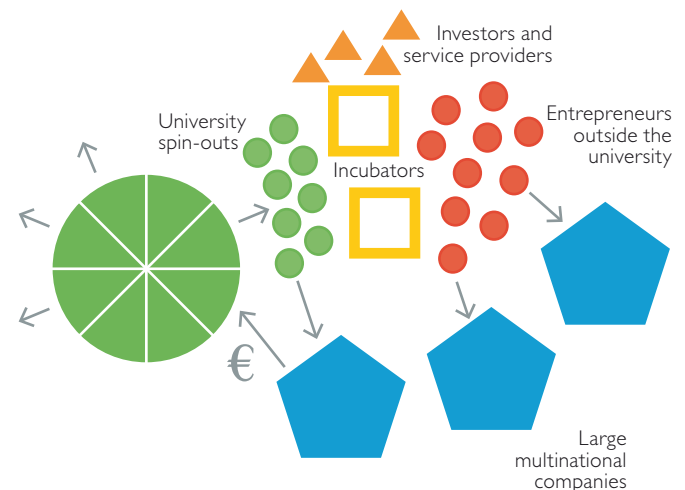


FIGURE 2: THE ESTABLISHMENT OF THE KNOWLEDGE REGION AND ENTREPRENEURIAL ECOSYSTEM AROUND AN INNOVATION-FOCUSED UNIVERSITY

The key elements present in the knowledge region that are established in this way, are summarised in **Figure 3** below.

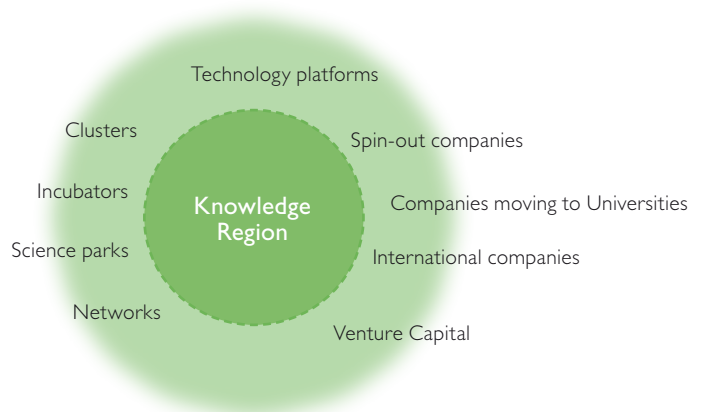


FIGURE 3: THE KNOWLEDGE REGION

The UTF as catalyst for knowledge regions



Martin Hinoul, one of the key players in the establishment of Leuven, Belgium as a leading university-based knowledge region, views the following to be necessary factors for the success of a knowledge region:

- **Critical mass of high-quality research:** Stellenbosch and Cape Town have four universities and two science councils within an hour's drive of each other in the Western Cape. If universities like Wits, University of Johannesburg (UJ) and Nelson Mandela Metropolitan University (NMMU) are added, a very powerful partnership is formed.
- **Favourable entrepreneurial climate:** Cape Town has become the hub of start-up activity in South Africa. The Silicon Cape initiative provides a banner under which various events and activities are facilitated to support entrepreneurs in the Western Cape. Stellenbosch has also developed into a centre of innovation, with the establishment of Stellenbosch University's LaunchLab business incubator, and the Technopark technology precinct. Similar innovation centres are emerging around many local universities (including Wits, UJ, NMMU).

According to an infographic published by the FIN24 website on 26 June 2015², 59% of South African start-ups are based in

the Western Cape, with Gauteng in second place hosting 29% of start-ups in the country. An extract from the infographic is reproduced above.

By starting it with the leading universities in these regions, the Fund will benefit from the existing entrepreneurial cultures in the Western Cape and Gauteng.

- **Legal framework:** The IPR Act makes provision for universities to own intellectual property developed by them on a non-full cost basis, but at the same time it tasks the university with commercialising that property.
- **Clear incentives and policies:** South African universities have all adopted policies which make provision for generous incentives to researchers to commercialise their inventions. More recently, the South African National Treasury has provided support for venture capital start-ups by allowing investors to claim a full tax deduction for investments in certain venture capital companies³.
- **Professional networks:** The five technology transfer offices in the Western Cape (discussed below) meet regularly to discuss issues and to support each other. There is also growing interest from industry to support the commercialisation of IP

² <http://www.fin24.com/Tech/Multimedia/INFOGRAPHIC-What-SAs-tech-startup-scene-looks-like-20150626>

³ Section 12J of the Income Tax Act, No. 58 of 1962.

The UTF as catalyst for knowledge regions continued

at local universities, and discussions with Accelerate Cape Town are underway. Informal networks between industry, universities and investors are well-developed in the Western Cape. Similar initiatives and networks exist in Gauteng and the Innovation Hub plays a major role in this.

- **Seed or VC Fund:** The Technology Innovation Agency (TIA) Seed Fund for universities is probably the best initiative in technology transfer in South Africa to date. With the addition of the proposed UTF, a major breakthrough will be achieved to kickstart an “innovation spring” in South Africa.
- **Infrastructure:** The LaunchLab business incubator and the Bandwidth Barn IT business incubator are great entrepreneurship initiatives in the Western Cape region. Similarly, the Innovation Hub and Raizcorp incubators in Gauteng provide the necessary infrastructure for entrepreneurs. More university campuses in South Africa are currently setting up business incubators.
- **Technology transfer entities:** There are five technology transfer offices in the Western Cape, namely Innovus, RCIPS at the University of Cape Town, and the TTOs of the University of the Western Cape, Cape Peninsula University of Technology and the Medical Research Council. In Gauteng, this network is even larger.
- **Quality of life:** Cape Town and Stellenbosch are renowned for the high quality of life they offer, with the country’s most important wine region, mountain scenery, beaches and nature reserves complementing its relative security, quality public schools and excellent infrastructure. Gauteng is renowned for the access it provides to wildlife, sites of historical significance, secure living in residential estates and availability of quality education. It is also the business centre of South Africa and thus the ideal location from which to commercialise IP. Similarly, the Eastern Cape provides pristine beaches and wildlife sites.
- **Industry and Government support:** As mentioned earlier, the TIA Seed Fund and increasing support from National Treasury and industry provide a promising basis for commercialising university technologies in the country.



Creating an Innovation Vortex

Creating an Innovation Vortex

Commercialisation of a university's intellectual property is done primarily through licensing IP or creating spin-out companies to exploit the IP commercially. The university's technology transfer office (TTO) is responsible for this function.

There is a significant pipeline of deal flow emanating from South African universities. If one considers the national statistics of published PCT patent applications emanating from South Africa for the five-year period 2009-2018 (information obtained from the *World Intellectual Property Organisation*), depicted in **Figure 4** below, significant innovation takes place at the top universities in South Africa. **The Patent Cooperation Treaty (PCT)** is an international patent law treaty, concluded in 1970. It provides a unified procedure for filing patent applications to protect inventions in each of its contracting states. A patent **application** filed under the **PCT** is called a **PCT application**. This is a powerful comparable indicator of innovation activity at an institution.

There are multiple reasons why Universities, through their TTOs, see value in being involved with technology transfer and the creation of spin-out companies.

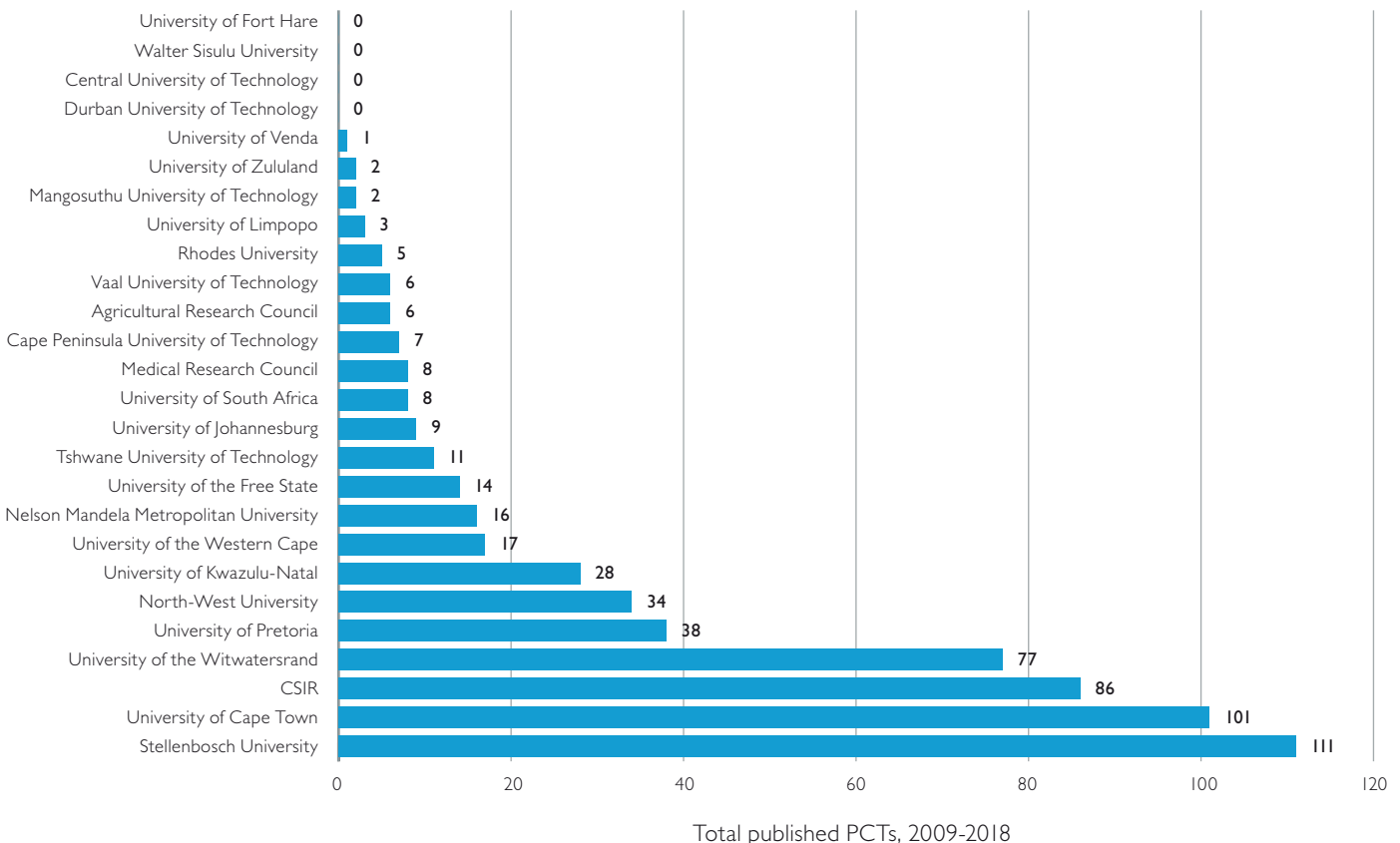
Technology transfer provides excellent opportunities for entrepreneurial researchers to become actively involved in

commercialising the output of their research, either by joining a start-up company in a full-time capacity, as technology consultants, or by becoming involved in the negotiation of a licence agreement. Ideally, teams of entrepreneurial researchers are involved in incubating technologies to the point of licensing or company formation. Eventually, (in the case of company formation) some team members may join the company as executive team members, whilst others may stay on in their positions at the university, continuing research that is fed to the new company on a continuous basis. In this case, the company has an academic footprint within the university and the university has created its own commercialisation vehicle for a specific area of research. In many instances, the start-up becomes a unique employer of highly skilled graduates, who would otherwise seek opportunities overseas.

The university, through its TTO, is in an excellent position to incubate young technologies and companies, thus reducing the risk for both the company and investors.

A university's shareholding in a start-up technology company creates a very important and special arrangement between the university and that company. The association with the university (via its TTO) provides significant credibility to the young

FIGURE 4: PUBLISHED PCT APPLICATIONS FOR THE PERIOD 2009-2018 EMANATING FROM SOUTH AFRICA



company (especially compared with its stand-alone peers), and by further leveraging its industry networks, the university can use its position to open commercial opportunities for the company and to provide incubation services to the company.

Spin-out companies often outsource some of their research to the university and not only receive a favourable IP agreement in this regard, but also gain access to students working on the company's projects at the university, early on in the process. Many are eventually employed by the company once they complete their studies. The university has thus assisted in creating an employment opportunity for these highly skilled students and retaining their talents, and the company benefits by employing skilled people who have an in-depth understanding of the technology and an established relationship with the company.

Once a spin-out company (often with only one product and thus a high risk profile) has become an established market player in its field with help from the TTO, it has an inside track to obtain licences for similar or complementary technologies that were developed independently at the university. In this way, the company may eventually become an industry partner to the university, providing a channel through which the university enhances its industrial credibility and footprint.

The creation of multiple spin-out companies from various centres of excellence within a university has the potential to modernise the commercial nature of entire city regions. This attracts not only other start-ups in that field to the region (as has been proven in cases like Leuven in Belgium and Cambridge in the UK), but also the presence of large multi-national companies, resulting in more funding for the university as well as the creation of science parks. Eventually these overlapping innovation districts become highly functional "knowledge regions", as outlined above.

Overall, the symbiotic relationship between a university and its spin-out companies reduces the risk to which the spin-out companies are exposed, increases the probability of their success and provides significant opportunities for both the university and the company via a powerful feedback mechanism. Once successfully established, this feedback mechanism becomes self-perpetuating, resulting in a continuous cycle or vortex of innovation between the University, its TTO, academic staff and students, on the one hand, and the spin-out companies, entrepreneurs and industry, on the other.

CASE STUDY:

Spinning out companies Stellenbosch University (SU)

Innovus, the technology transfer and innovation company of Stellenbosch University, established the LaunchLab business incubator to ensure not only that its group of companies enjoys the best early-stage development, but also to support its students' ventures and to bring entrepreneurs from outside the university to the SU campus. The results of introducing this initiative were astonishing. On 1 August 2013 when the LaunchLab was opened, the Innovus group of companies consisted of 10 companies. Only three of these companies were purely technology based, all in start-up stage, and three more companies offered technology-related services. The remaining four companies had no technology basis. Initially, the LaunchLab hosted no Innovus companies. However, by the end of 2014, Innovus had added seven companies to its group and no less than five of these are pure technology ventures.

In 2015, three technology-based spin-out companies were formed with six more in the pipeline in 2016. In **Figure 5** below, the rate of spin-out company formation at Stellenbosch University is depicted and it is quite evident that the opening of the LaunchLab business incubator was a pivotal point in this regard:

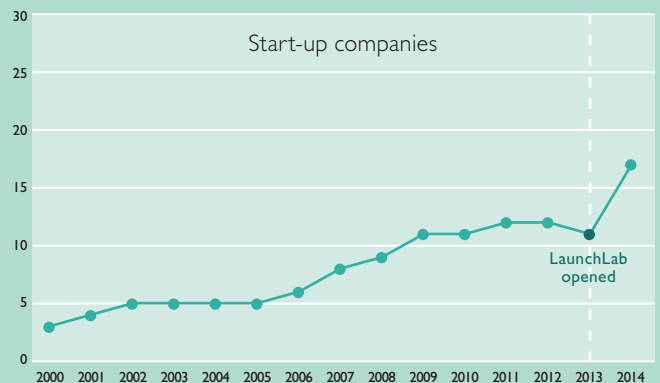


FIGURE 5: THE RATE OF SPIN-OUT COMPANY FORMATION AT STELLENBOSCH UNIVERSITY

A paradigm shift is taking place on the SU campus. This is also evident from the fact that Innovus staff are now regularly receiving calls from campus-based inventors that start with the words, "I want to start a company." In many cases, a professor wants to establish a company to commercialise the research output of his or her laboratory, but does not want to join the company on a full-time basis, although he or she wants to be a shareholder. This provides an avenue for the university and the professor to employ some of their best postgraduate students.

Creating an Innovation Vortex continued

Innovus provides comprehensive services for campus inventors wishing to start a new venture. Firstly, once the motives for establishing the company are fully understood, the inventor is assisted in drafting a business plan. A few golden rules apply in the decision on whether or not to start a company:

- It remains the university's decision to start a company to commercialise its IP;
- A spin-out company may not compete with the university for research funding etc.;
- A company will not be established to bypass the university's Financial Policies or especially the indirect cost recovery rate on third-stream income;
- There must be a clear business case; and
- There must be a project champion.

In some cases, however, companies are initially established to serve as “firewall” companies to enable Innovus to conclude certain agreements with counterparties that SU would be precluded from entering into, or in order to reduce the risk for the University and Innovus whilst still commercialising the IP. However, when creating such entities, the aim is always to steer the company towards a fully commercialised, sustainable entity.

We believe that the leading South African universities are ready to take the next step in the evolution of tertiary learning institutions, and to become centres of local knowledge regions. In order to establish these regions, however, the universities require the support of a dedicated fund to take their early-stage technologies to commercialisation. In order to understand the proposed model of the UTF (which is set out later in this document), it is necessary to consider the existing technology transfer landscape and specifically the phases through which intellectual property is commercialised and the access to funding that universities have for that purpose.

Development Phases for Commercial Exploitation of IP

In order to address the universities' mandate to increase the production of valuable products and services for the community, our TTOs encourage, facilitate and support the commercialisation of university IP through licensing, joint venture development or the creation of spin-out companies.

Intellectual property and technology can typically be expected to go through the following phases as illustrated in **Figure 6** below:

- **Research phase:** Intellectual property is developed within the university environment. The focus of this phase is often exploratory research and development of a concept or idea leading to some early positive results in the laboratory. This phase is typically adequately funded through a mix of industry, government and philanthropic support.
- **Proof-of-concept phase:** The IP is refined and more clearly defined. This stage centres around activities that include

developing early-stage prototypes, registering patents and trademarks, performing limited market-feasibility assessment and viability testing, and developing business plans for potential spin-out entities. As this phase falls between the research phase and commercialisation, it is typically the most neglected from a funding point of view. Venture capital and angel investors usually only display interest in an opportunity once the potential for successful commercialisation can be demonstrated, which leaves the proof-of-concept phase reliant on a very limited pool of seed funding.

- **Pre- and early commercialisation phase:** At this point a patent is either licensed or the focus turns to the formation of spin-out entities and the provision of seed funding for the start-up phases of such spin-out entities. This often includes funding final R&D stages, and finishing product development. It is at this stage that most venture capital or early-stage investors will consider investing in an opportunity.

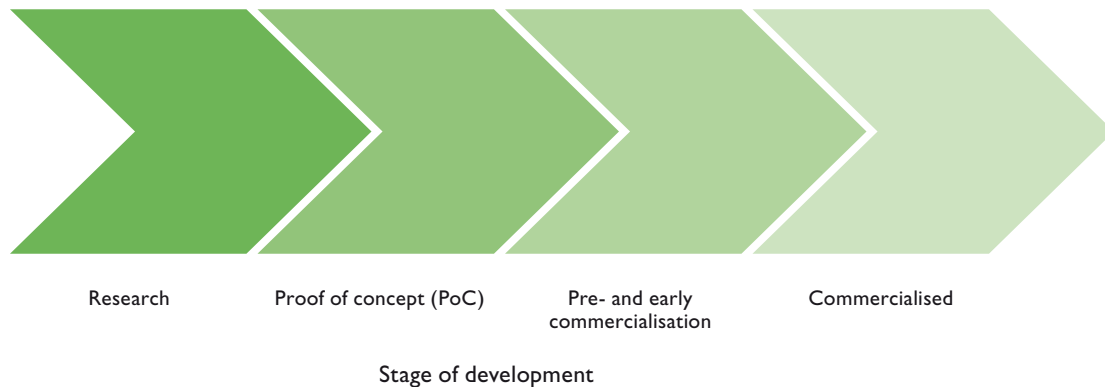


FIGURE 6: THE TYPICAL STAGES OF TECHNOLOGY DEVELOPMENT

University Seed Funds

Some universities have access to a small fund operated by the TTO to perform innovation activities, and to attempt to “fill the gap” in relation to the proof-of-concept phase of IP development. The activities of these seed funds include:

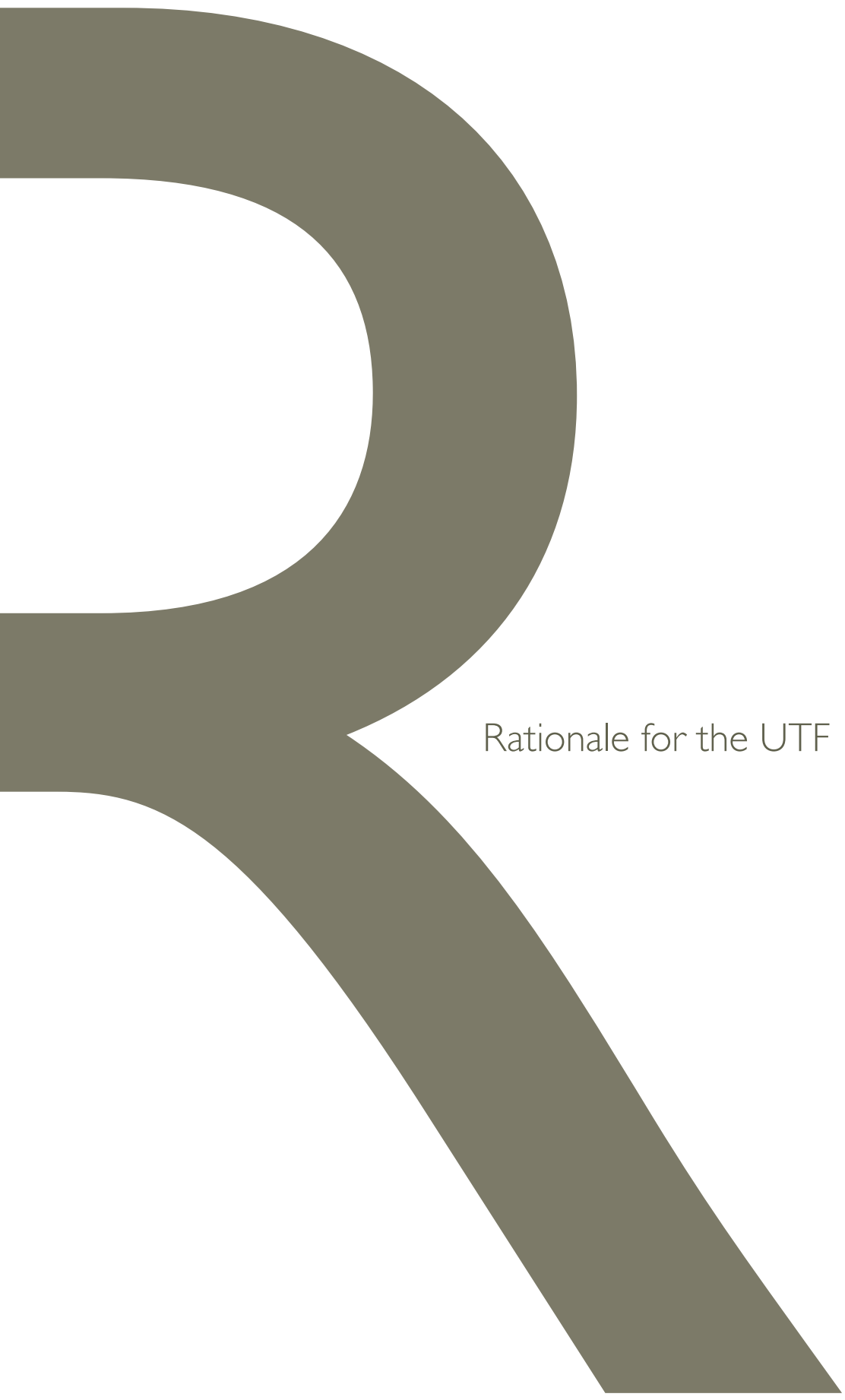
- Specific project investments;
- Patent expenses;
- Legal expenses; and
- Consulting services.

Consulting services and specific project investments ordinarily entail:

- Proof of concept;
- Prototype development;
- Prior-art searches;
- Production of market samples;
- Refining and implementing designs;
- Conducting field studies;

- Support of certification activities;
- Piloting, scale-up and techno-economic evaluation;
- Engaging with interested potential commercial partners;
- Market research;
- Business plan development;
- Start-up company support; and
- Advising on ideal company structures

An overriding principle of these seed funds is to attempt to leverage existing funding from external sources, before using internal funds. Available sources from public-sponsored programmes such as the Technology Innovation Agency (TIA) Seed Fund cater for proof of concept and some other early-stage activities. The TIA Seed Fund provides leading universities with funding of approximately R2 million per annum. To date, this instrument is probably one of the best interventions in technology transfer at universities, but it is not nearly sufficient to support the level of innovation that can be achieved at our local universities.



Rationale for the UTF

Rationale for the UTF

Whilst South Africa has a small, but growing, VC sector, the national innovation system still displays several structural deficiencies.

One of the most significant weaknesses of our current system, often overlooked, is the lack of early, competent and coherent support for new ventures in the research-supported high technology sector. In the four years ending in 2012, only 4% of VC funding was allocated to seed funding⁴ of this nature. Over the last 10 years, this sector has attracted less than 2% of private VC investment in SA, despite world-class opportunity production, and a consistent funding requirement of more than R500m from entrepreneurs, large universities and research councils, such as the CSIR (Council for Scientific and Industrial Research) and MRC (Medical Research Council).

Influenced also by the VC sector's post-dotcom contraction, government perceived a market failure, and implemented public seed funding instruments around 2004. In 2008, the state embarked on the implementation of a "second generation" innovation policy, encapsulated in the IPR Act. Recipients of state research funding are now required by law to discover, report, protect and commercialise intellectual property, and every research institution in the country must have a Technology Transfer Office (TTO) to manage the expensive and often onerous legal requirements introduced by the Act.

For more than a decade, state institutions such as the Innovation Fund and its successor, the Technology Innovation Agency, have kept entrepreneurs hopeful, but government was essentially the only significant early-stage investor. This often produced outcomes that were less than satisfactory, and the absence of private capital in seed stage technology investment in South Africa remains a fundamental deviation from international best practice. While research institutions have rapidly advanced their professionalism, the absence of skilled seed capital to move technical opportunities from the lab to the VC door remains a key weakness in the ecosystem.

Individual universities in South Africa lack the critical mass to maintain the deal flow to ensure the success of a seed fund vehicle such as the one envisaged (by way of illustration, the Oxford University research budget is approximately equal to the entire budget of all South African universities combined). There is thus a need for collaboration, which has been the motivation behind the four universities acting together to establish the UTF (with the intention that further universities will be involved in future).

⁴ The South African Venture Capital Association (SAVCA) 2012 VC Survey.

In order to grow a new technology towards successful commercialisation, funding is required for activities during the different phases of development identified above. **Figure 7** below gives an indication of the existing and traditional funding tools available for each phase, and illustrates the funding gap where university seed funds and technology funds should play a critical role.

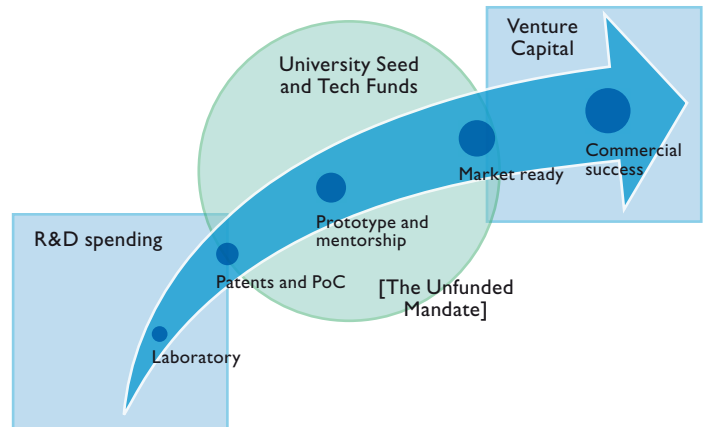


FIGURE 7: AVAILABLE FUNDING SOURCES FOR TECHNOLOGY DEVELOPMENT AT UNIVERSITIES

Typically, university TTOs do not have the funds to develop technologies to VC-funding readiness (or to the stage where an informed decision to mothball the technology can be made):

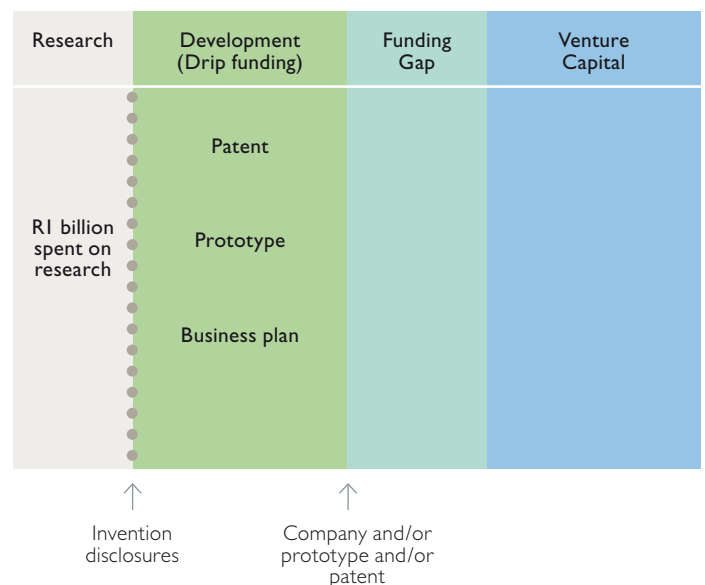


FIGURE 8: THE FUNDING SOURCE CHALLENGE FOR EARLY-STAGE UNIVERSITY TECHNOLOGY

The TIA Seed Fund plays a role across the development and funding gap stages, but it is not nearly sufficient to fulfil the needs in this regard. The unfunded mandate causes the behaviour

Rationale for the UTF continued

of TTOs to become skewed away from optimal: they tend to start companies too early and then seek funding for them from sources with a mismatched risk profile (i.e. before they have been sufficiently de-risked). As a result, investors are either unwilling to invest or they compensate for the high risk by taking disproportionately large equity portions, which in turn disincentivises the entrepreneurs.

Ideally, the university TTOs need to be able to support the nurturing of IP for a longer period. As can be seen in **Figure 9** below, this implies that the development phase must stretch right across the funding gap. The ideal funding model should enable the TTO to provide incremental or “drip funding” to a new technology as it is developed (preferably within a dedicated incubator). This will prevent premature company formation and ensure that technologies are market-ready before leaving the safe environment around the TTO.

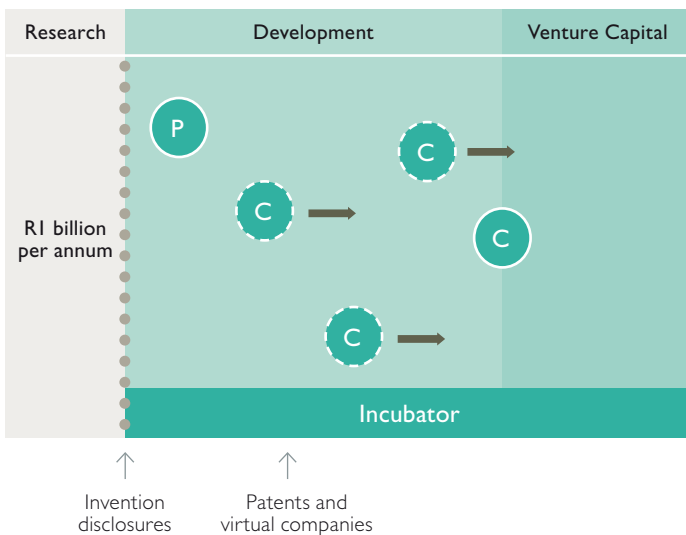


FIGURE 9: CHANGING THE COMMERCIALISATION MODEL

The establishment of an early-stage VC fund addresses this problem well:

- The fund can allocate a limited percentage of its assets to early stage and seed funding administered by the TTO, to ensure that a pipeline of investment-ready technologies is made available for more traditional, VC-style investment; and
- In return, the fund will secure preferential rights to that pipeline, plus it will share in the ownership rights negotiated by the TTO in return for the early- or seed-stage funding that it provided.

This concept is not new – many universities abroad (with a steady growth in numbers, particularly in the USA) have either their own, or regional, technology funds to support development work. Examples include the various University Challenge Seed Funds at Oxford, Cambridge, Imperial College and University College of London (established via a UK Government initiative involving partnership with industry and philanthropic funders), the Strathclyde Innovation Fund and the UK’s IP Group Fund, as well as the Gemma Frisius Fund at Leuven Katolieke Universiteit.

Proposed Terms and Structure of the UTF

In the light of the context provided above, the proposed structure and terms on which the UTF will be established are set out below. The intention is to incorporate best practice, both from a university technology fund and commercial investment point of view, to ensure the fund achieves both its goals of effectively incubating new technologies and providing attractive returns to investors.

Firstly, the UTF aims initially to combine the strengths of four universities to raise a single “umbrella” fund of funds, that will feed into independent university funds – one “Institutional Fund” (IF) for each university. In this manner, the UTF will provide the platform for investors to invest in the technology output of all four universities. Further universities can be encouraged to participate in the UTF once its success has been demonstrated.

Secondly, the intention is not for the UTF to become the sole source of funding for each IF. The universities will have a fixed “base-line” participation of 5% in their own IFs, in recognition of the resources and management time that they will dedicate to the funds, their agreement to provide preferential rights to their pipeline of spin-outs to the IFs, and the use of the university’s name and credentials in association with the IFs. Each university will also be able to increase its participation in its dedicated IF by raising further investment into the fund, for example, via its own funds, or investment by alumni or from other sources who wish to support a particular university.



Investment Mandates

Investment Mandates

The investment mandate of the UTF will be relatively limited, being effectively only to invest in the underlying IFs. The UTF will allocate funds to the underlying IFs on the following basis:

- Initially, the UTF will provide a limited, equal capital commitment to each IF, to enable the IF to support the activities of its associated university TTO – i.e. the provision by the TTO of drip-funding to promising start-ups in line with the TTO’s early-stage development role. This initial capital commitment will be made available to the IF over time, so that it can in turn support its associated TTO on an ongoing basis.
- IFs which can demonstrate the need for additional funding, will be entitled to apply to the UTF for an accelerated draw-down of their initial capital commitment or for additional funding to be allocated.
- In addition to the initial capital commitment referred to above (which is aimed at supporting the activities of the TTOs), each IF will initially also receive a capital commitment that may be drawn down in order to fund investments in spin-out companies (once these progress to the point of commercialisation outside the TTO). Each IF will initially receive the same “investment” commitment, with the majority of the UTF’s funds remaining unallocated. The unallocated portion of the UTF’s funding will thereafter be allocated to the IFs by its fund manager and investment committee, taking into account the quantity and quality of the deal flow generated at each university.

Certain minimum requirements will also be expected from IFs (and their associated universities) wishing to receive capital commitments from the UTF. These will include a TTO with suitable resources to administer the development of IP to the point of investment readiness, the availability of incubation infrastructure (to reduce the early-stage risks involved with new spin-out companies), and an acceptable standard governance framework for all new spin-out companies.

The investment mandate of each underlying IF will, likewise, be relatively limited, as the IFs will invest only in IP or technology-based spin-out companies arising from the activities of their associated university. The mandate will specify criteria which spin-out companies must meet in order to qualify for investment, including adherence to the applicable university governance framework, compliance with legislation, the presence of one or more suitably qualified champions who will be adequately involved in managing and driving the spin-out company forward, and clearly identifiable intellectual property that is capable of registration or another form of legal protection.

A distinguishing factor and key aspect of the IF’s investment mandate is that a portion (20%) of the IF’s assets (“**the Development Allocation**”) will be made available to the university’s TTO to manage and to fund the incubation and prototyping activities across the development stage as indicated in **Figure 9**. The Development Allocation will be funded out of the initial capital commitment from the UTF and other funds raised independently by the IF, and will ensure that the funding gap identified above is filled. The remaining and bulk portion of the IF’s assets (“**the Investment Allocation**”) will be funded from the “investment” commitment made by the UTF and the IF’s own sources, and will be managed as a traditional VC fund by the fund manager, under the supervision of an investment committee. The IF fund structure is shown in **Figure 10** below.

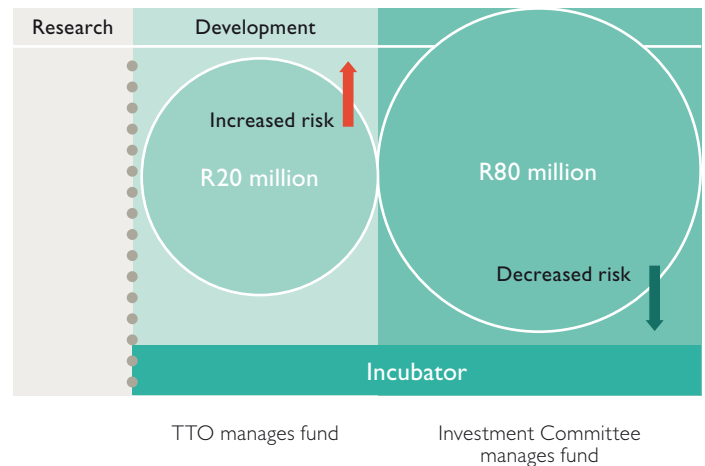


FIGURE 10: PLACING THE FUND AT THE INSTITUTION

This unique fund model is ideally suited to the university technology environment and it takes existing models of early-stage university funds a leap forward. Such a fund enables the university to bridge the funding gap AND to provide venture capital investment to its spin-out ventures, making it a complete turnkey funding solution. Whereas the risk involved in the Development Allocation will be relatively high, the risk is immediately decreased on the bulk part of the fund in the Investment Allocation.

Benefits to Investors from the Development Allocation

The Development Allocation within each IF is not intended to take the form of a grant or other form of philanthropic investment in the TTO, but is in keeping with the overall commercial focus of the IFs. In particular, the IF will receive the following benefits from the Development Allocation:

- It is the practice of the TTOs to provide development / seed funding to inventors only in return for a share of the technology and any associated businesses. To the extent that IF funds are used to provide the funding, the corresponding ownership share negotiated by the TTO will accrue to the IF;
- As explained in more detail below, the IF will obtain preferential rights to invest the Investment Allocation in any opportunities funded out of the Development Allocation;
- The TTOs will not charge any management fees in respect of the funds set aside for the Development Allocation, as their employee salaries, infrastructure and the like are covered by the relevant institution;
- By providing for the Development Allocation, the IF is ensured that the pipeline of opportunities provided to it by the TTO (and in which the Investment Allocation can be invested) will be of a suitable quality;
- By the time a project is mature enough for venture capital funding, the fund managers of the IF will not need a very comprehensive and expensive due diligence, as they will have the ability to monitor and provide input regarding projects whilst under development by the TTO. The investment risk on the Investment Allocation will thus decrease as the fund managers will have a far better understanding of the technology and its history before making a decision to invest in it; and
- Finally, both the UTF and IF will offer their investors preferential co-investment rights in any investment opportunities that are available to the IF and which are not taken up by the IF itself. In other words, should an IF (for any reason) not wish to, or be unable to, invest the full amount required by a start-up, or if the IF considers that it is in the interests of the start-up to have co-investors for strategic reasons, then the investors in the IF and the UTF will be provided the first right to such co-investment opportunities on a *pro rata* basis.

Preferential Rights to Invest

As indicated above, one of the key benefits derived by the IFs from providing the Development Allocation, will be to secure preferential rights for the IF to invest in any opportunities that are supported using funds provided out of that allocation.

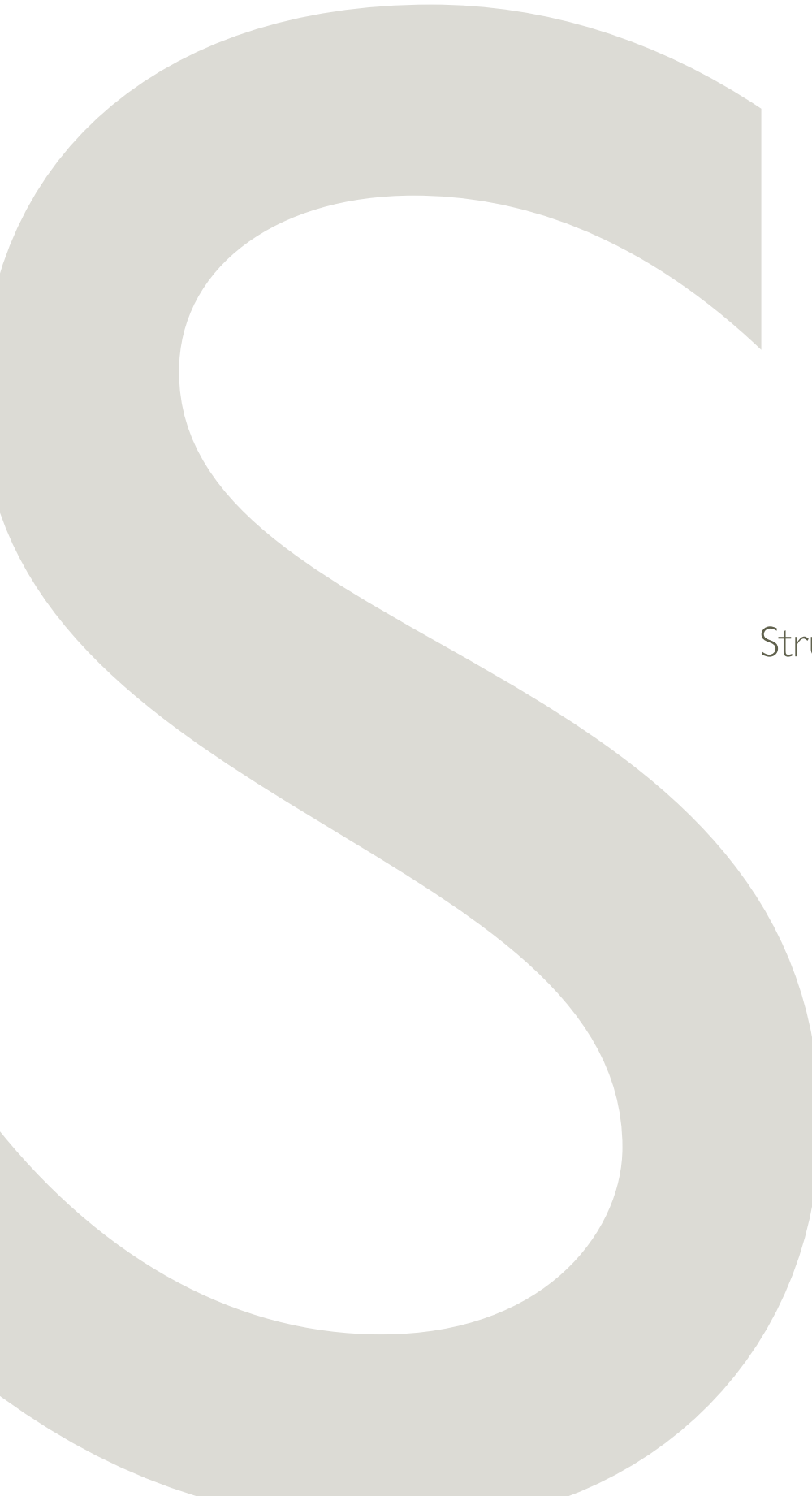
More precisely, it is proposed that:

- An IF will have a right of first refusal to consider and invest in any spin-out companies that are built around a technology or other IP that was developed by a TTO, using Development Allocation funds;
- If the IF, the TTO and the entrepreneurs involved in the spin-out company are unable to agree terms, the TTO and the entrepreneurs will then be entitled to engage with third-party investors. However, the IF will retain a right of first refusal to match the terms of any third-party investment that the TTO and/or entrepreneurs are willing to accept; and
- To ensure that the TTOs do not “cherry pick” opportunities or technologies to fund themselves, they will be obliged to pay a royalty of 15% of any cashflows realised out of such opportunities to the IFs.

Other features of the Funds’ Investment Mandates

In addition to the terms outlined above, the UTF and IFs’ investment mandates will contain the following provisions:

- **Investment Exclusions:** The only industries in which the IFs will not be allowed to invest are the tobacco and gambling industries. The IFs will be entitled to invest in alcohol-related technologies (given some of the universities’ traditional role in innovation in the wine industry).
- **Maximum Investment per Investee:** The IF’s will be allowed to invest a maximum of R10m in any one investee company, subject to the ability of the IF to make follow-on investments in excess thereof with Investment Committee approval.
- **Gearing:** No gearing (i.e. borrowing) at the UTF or IF level will be allowed. The IFs may provide security for borrowings of investees, subject thereto that the aggregate sum of such securities shall not exceed 50% of the net asset value of the IF at the time of providing such security.
- **Distributions:** All income and funds received from the realisation of assets are to be distributed to the investors, subject to investor approval for funds to be used to reinvest or make follow-on investments.
- **Co-investments:** The IFs will encourage co-investment by its own investors and the investors in the UTF, not only in order to spread risk but also to allow for the involvement of strategic investors that can enhance the prospects of the spin-out’s success. As indicated above, the investors in the IF and UTF will have a right of first refusal to such co-investment opportunities, and only if they choose not to take up such rights, will other funds and investors be approached.



Structure and Governance
of the Proposed Funds

Structure and Governance of the Proposed Funds

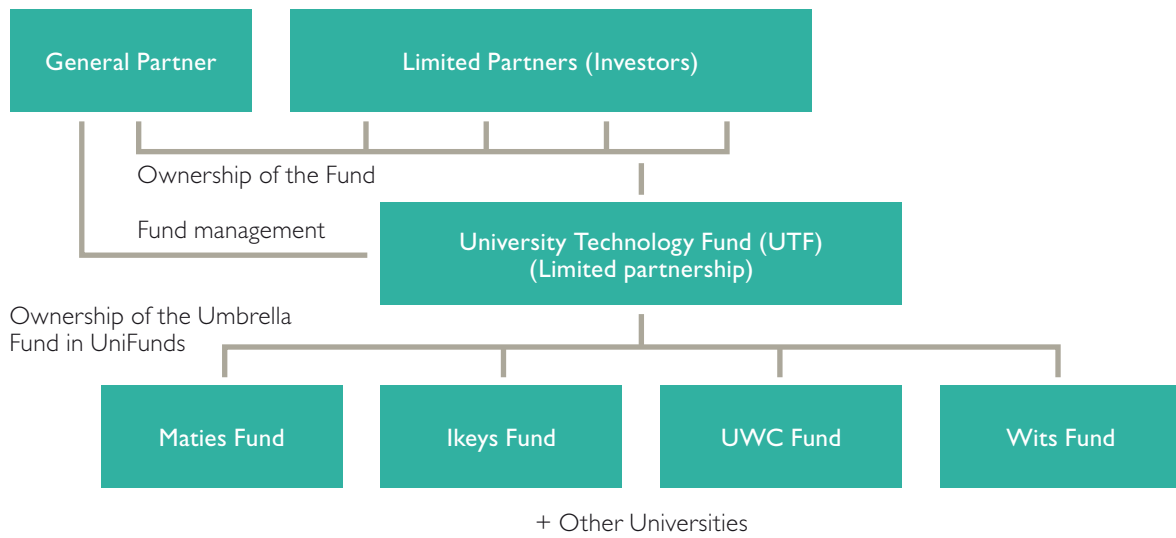


FIGURE II: THE STRUCTURE OF THE OVERARCHING UNIVERSITY TECHNOLOGY FUND

The structure of the UTF, which will be an umbrella fund of funds that will allocate capital commitments to the underlying IFs, is illustrated in **Figure II** above. It is proposed that the UTF will be established as an *en commandite* (or limited) partnership, as this is an investment structure familiar to most private equity or venture capital investors, and corresponds to fund structures used internationally. The partnership will consist of a general partner, who will manage the affairs of the UTF, and various limited partners (the investors in the UTF) whose identity will not be disclosed to the public. The limited partners in an *en commandite* partnership will have no liability to the creditors of the partnership beyond the amount invested by them.

The general partner will be a recognised, independent fund management company with fund-of-funds expertise (the process of selecting this manager already being underway). The UTF will also have an investment committee comprising representatives of the general partner (2), the limited partners (3) and the

universities (2). The investment committee will make decisions by way of majority vote.

The role of the general partner will, inter alia, be to assist in fund raising, to administer the affairs of the UTF, to make allocations of funds raised to the underlying IFs in accordance with the principles set out above, to monitor the performance of and compliance by the IFs with their fund mandates, to support the activities of the IFs and promote co-operation between them, and to report to and liaise with the limited partners. The investment committee's role will, inter alia, be to provide input on all fund-related matters, to resolve any conflicts of interest that may arise in relation to the general partner, to monitor performance of the general partner's duties, to remove and replace the general partner (if necessary), to monitor the UTF's investments and (where required by the UTF's fund mandate, as explained above) to decide how to allocate the UTF's capital.

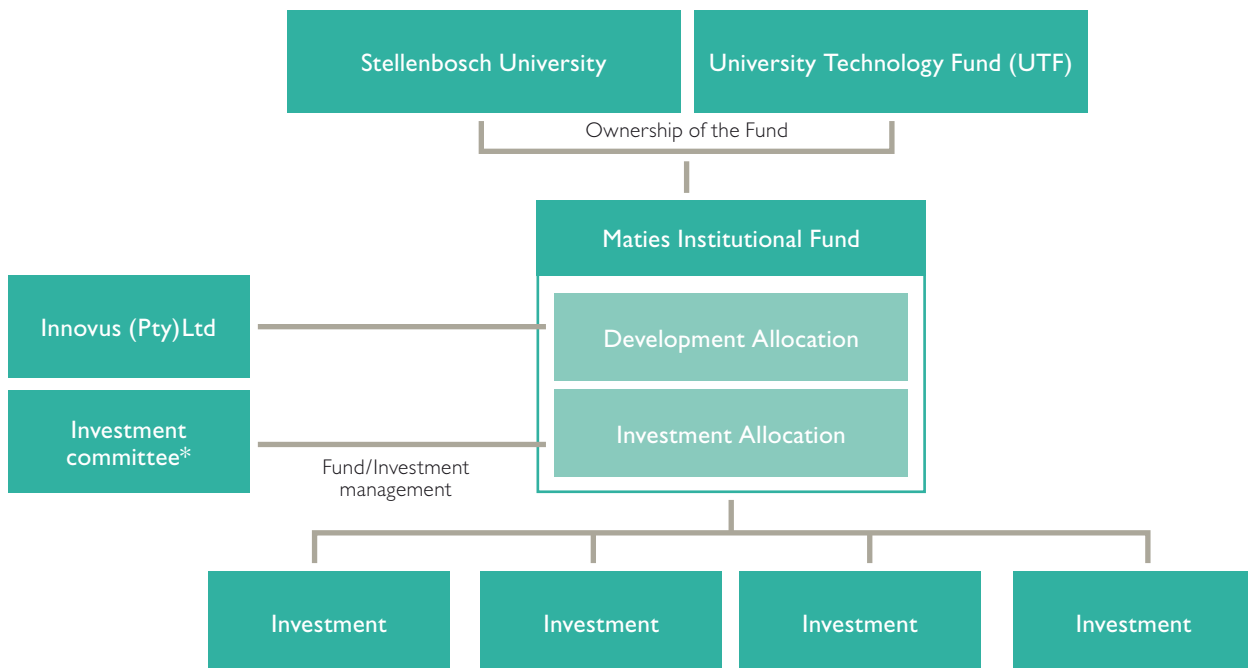
Structure and Governance of the Proposed Funds *continued*

The structure of the individual university funds (the IFs) is outlined below in **Figure 12**, using the Stellenbosch University fund as an example. It is proposed that the IFs, as with the UTF, will be *en commandite* partnerships. The overarching UTF will be a limited partner (and most likely the single largest investor) in each IF, but in addition the university itself and/or its alumni will be entitled to invest in and act as limited partners in the IFs. The general partner will be a company established by the relevant university's TTO, and staffed with representatives from the TTO and from industry VC specialists. The general partner will manage the Development Allocation of the IF, and will outsource the management of the Investment Allocation to a recognised, independent VC fund manager (or possibly more than one VC manager, with each investment being allocated to participating, recognised VC managers on a rotational or suitability basis.)

The general partner will provide the Development Allocation to the TTO of the university on a draw-down basis, as outlined above, and will monitor the projects that the TTO incubates. The independent fund manager that manages the Investment Allocation will evaluate investment opportunities arising out of

the TTO and university's activities, select opportunities to invest in, negotiate and conclude such investments, monitor and manage the investments with a view to realising the best possible returns for investors, and generally attend to the day-to-day management of the IF. It is intended that there will be a large degree of interaction between the TTO and the independent fund manager to ensure that the independent fund manager has input into the TTO's process of selecting and developing opportunities.

Each IF will also have an investment committee, consisting of representatives of the UTF (2), other limited partners (1), the university and its TTO (1) and the independent fund manager (2). The role of the investment committee will, *inter alia*, be to review and make non-binding recommendations in relation to the investments that the general partner proposes for the IF, to monitor the performance of the general partner's duties, to remove and replace the general partner (if necessary), to monitor compliance by the general partner with the IF's mandate, and to resolve conflicts of interest where these may arise between the IF and the general partner. Decisions of the investment committee will be made by way of majority vote.



*Appointed by the General Partner of the UTF and owners

FIGURE 12: THE STRUCTURE OF THE INDIVIDUAL UNIVERSITY FUNDS (USING MATIES IF AS EXAMPLE)

Salient Terms

The following is a summary of the proposed salient terms of the Funds.

UNIVERSITY TECHNOLOGY FUND	
Fund name	The University Technology Fund I
Fund type	<i>En commandite</i> partnership
Targeted fund size	R400m
Minimum investment	R1m
Fund-raising period	1 year to hard close
Expected returns	20%–30% before fees
Management fees	1% of committed capital
Carried interest	10% of outperformance over JIBAR plus 400 bps
Ramp-up / Investment period	5 years
Fund lifespan	7 years plus 2 years to exit (with ability to convert to evergreen fund with investor approval)
Targeted number of investments	4–10 (i.e. the underlying IFs)
Valuations and investor reporting	Half-yearly

INSTITUTIONAL FUNDS	
Fund name	To be decided on by each University
Fund type	<i>En commandite</i> partnership
Targeted fund size	R80–120m (dependent on University requirements)
Development allocation	20% of committed capital (i.e. approximately R16m – R24m)

Investment allocation	80% of committed capital (i.e. approximately R64m–R96m)
Minimum investment	R1m
Fund-raising period	1 year to hard close
Expected returns	25%–35% before fees
Management fees	0% on Development Allocation (costs borne by TTO), 2% on Investment Allocation
Carried interest	None on Development Allocation, 15% of outperformance over JIBAR plus 500 bps
Ramp-up / Investment period	5 years
Fund lifespan	7 years plus 2 years to exit (with ability to convert to evergreen fund with investor approval)
Targeted number of investees	15 (maximum 20)
Targeted investment per investee	R5m–R10m, follow-on investments with Investment Committee approval
Valuations and investor reporting	Half-yearly

In addition to the above, each fund (i.e. the UTF and each IF) will appoint independent service providers, as follows:

- An independent administrator and custodian, whose responsibility it will be to administer the assets of the fund, manage all cash transactions, maintain the records of the fund and keep custody of all fund assets; and
- An auditor, initially selected by the universities establishing the funds, and thereafter appointed annually by the investment committee, out of the top- or mid-tier auditing firms in South Africa.

Pipeline

The universities have a ready pipeline of spin-out companies that would be ideal prospects for the fund managers of the IFs to screen for possible investment. Stellenbosch University, for example, has the following spin-out companies that it is currently seeking to fund:

- A company formed to carry out clinical trials in respect of a synthetic lung surfactant, with a view to obtaining formal drug registrations from the Medical Research Council, the United States Food and Drug Administration and the European Medicines Agency. Patent applications have been filed in respect of the surfactant, and initial trials have been very positive.

- A company that has developed a proprietary software mechanism aimed at preventing the pirating of copyrighted media, particularly by targeting so-called peer-to-peer sharing websites. This software has already attracted significant interest from major media houses, who are supporting its development and initial trials.
- A company that has developed a technology to dramatically improve the power efficiency of hot-water geysers, by monitoring and profiling the use of hot water and automatically adapting the operating times of the geyser accordingly.
- Various other opportunities, based on technologies in diverse areas such as filtration systems, natural pesticides and renewable energy technologies.

CASE STUDY: SNC Fibers



In addition to the above pipeline, the universities have already successfully developed and funded a number of technologies, that serve as case studies for the type of

investments proposed for the UTF. One such success story, which nicely demonstrates the need for TTOs to be able to fund technologies incrementally until they are ready for VC investment, is that of SNC Fibers.



The SNC Fibers story began with a prototype improvement on traditional nanofiber spinning technology, in which nanofibers are spun from an electrically charged injector needle, through which a polymer is injected onto an electrode plate.

Stellenbosch University researchers were looking for a method in which to overcome a traditional weakness of this technology, namely the clogging of the injector needles.



Over time, a number of prototype iterations (funded incrementally by Innovus) were developed, each of which overcame a further technology hurdle. Eventually, the research resulted in an entirely new method of

spinning nanofibers: from an electrically charged, polymer-coated ball, rather than from individual needles. This not only overcame the original issues referred to above but in fact revolutionised the entire spinning process: the new technology allows nanofiber sheets to be spun in quantities measured in kilograms per hour, rather than tens of grams as with traditional technologies.

In 2011, Stellenbosch University and Innovus launched SNC Fibers commercially, and successfully secured outside investment in the company. The company has since continued its commercial success. More information on the SNC Fibers story is available on the company's website, at www.sncfibers.com.

Benefits for Universities

Whilst the benefits for investors in the UTF are relatively self-evident (being the financial reward of investment returns), it is important that the participating universities also benefit substantially. The success of the UTF will depend on universities remaining committed to the funds, providing various resources to the funds and spin-out companies, and continuing to incubate and support new technologies. Properly administered, the UTF and IFs should provide universities with the following:

- The availability of a committed funding line to commercialise the universities' research and development, and particularly to bridge the "funding gap" that currently exists;
- The universities and TTOs will benefit financially from having the ability to develop and commercialise their patented research on an ongoing basis and from having an established framework within which to do so;
- The structure of the UTF will encourage cross-collaboration between universities, and thus enhance the production and development of new, lucrative technologies;
- Having a committed funding line for university entrepreneurs will encourage academics and students to come to the universities to study and perform research; and
- The TTO and the universities will be, and will be seen to be, supporting job creation for the universities' graduates.

Conclusion

South African universities are poised to become central role-players in the revitalisation of the country's technology landscape. Recent developments, particularly around the IPR Act and its focus on technology transfer by universities, have already resulted in a marked increase in the production of IP and associated spin-outs.

The key hurdle to unlocking our universities' capacity for innovation, remains funding. The UTF, being the product

of collaboration between four leading universities, has the potential to address this need. Whilst the synergies between the research activities of a university, the "incubator" role of their TTOs, and a technology-based VC fund are self-evident, these are simultaneously supported by the favourable environment for start-ups in the Western Cape and Gauteng. Overall, this confluence of factors provides a compelling investment case for investors seeking VC-type exposure.



INNOVUS

Prepared by Innovus Technology Transfer (Pty) Ltd

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INNOVUS

Innovus Technology Transfer (Pty) Ltd is
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ADDENDUM A
Venture Capital Partnerships
with Universities

ADDENDUM A: Venture Capital Partnerships with Universities

During the course of the last three to five years, it has become clear that the technology pipelines emanating from research universities are defining a new asset class. Between 2011 and 2015, Venture Capital flows had unmistakably indicated that while single campus investment deals, accessing all the university's IP, are still being done, the larger pipelines ensured by collaborative "bundling" of especially technology-based IP assets across university boundaries are delivering compelling efficiencies, economies of scale and risk-reduction synergies.

Smart money is flowing into these university-affiliated VC deals.

The examples below present a few of the notable arrangements between universities and investment capital, and illustrate some key features :

- It is an established trend, and is likely to continue. Some of these funds are now confident enough to focus on specialised sub-sectors of university intellectual property portfolios.
- Collaboration, not competition, is key.
- Government support (local or central) is often an important catalyst for successful raising of capital.
- The universities often contribute to the new funds from their endowments, but fundraising occurs via all traditional mechanisms, such as governments, private placement, and stock exchanges.
- Structures are being created to allow the universities, their alumni and often their students to participate as investors.

1. IP Group

This company is seen as the pioneer in university-affiliated VC activity. In 2000, the company offered to fund new buildings for Oxford University's School of Chemistry in return for half the royalties of inventions emanating from that school for 15 years. The company now partners with universities worldwide, is a FTSE 250 constituent (listed on the Main Market of the LSE – code IPO), has invested in about 100 companies, and has estimated the fair value of its portfolio to exceed £550 million.

2. Apollo Therapeutics Fund

A group of global pharmaceutical companies collaborated with the tech transfer offices of three leading research universities in the UK to launch a £40 million fund that will support the commercialisation of groundbreaking academic research in healthcare.

The fund's underlying consortium consists of AstraZeneca, GlaxoSmithKline, Johnson & Johnson as commercial partners,

and Imperial Innovations, Cambridge Enterprise and UCL Business – the technology transfer offices from Imperial College London, the University of Cambridge, and University College London respectively.

3. Imperial Innovations Group

Imperial Innovations is the TTO of Imperial College. Since January 2011, when it raised £140 million from investors, the company has made investments in early-stage technology businesses based on, or associated with, IP developed at the University of Cambridge, the University of Oxford and University College London. It is listed on AIM in London.

Since the IPO in 2006, it has invested £160,9 million, and its portfolio of companies has raised more than £750,0 million. The Group has holdings in 93 portfolio companies.

In Feb 2016, it announced a placement of shares to raise £100m. The envisaged major shareholders are

- Invesco Asset Management Limited 39,7%
- Woodford Investment Management LLP 19,6%
- Imperial College of Science, Technology and Medicine 17,4%
- Lansdowne Developed Markets Master Fund Limited 12,8%

4. University College London

UCL's Technology Fund is worth £50m and is backed by Imperial Innovations. The Fund will be investing in spin-out opportunities emerging from all UCL's faculties.

The UCL fund displays an important structural aspect– another tech transfer office is a cornerstone investor, again emphasising the fact that university collaboration underpins successful contemporary tech transfer. UCL is using a large chunk of public investment cash from the European Investment Fund, matched by Imperial Innovations.

5. Oxford – Isis and OSI

In March 2015, the University of Oxford and Isis Innovation, the University's technology commercialisation subsidiary, launched a partnership with newly created Oxford Sciences Innovation plc (OSI) to develop and commercialise Oxford IP into market-leading companies.

In order to fund the next generation of spin-out companies from the University, OSI raised £320m, with six cornerstone

ADDENDUM A:

Venture Capital Partnerships with Universities continued

investors on board: Invesco Asset Management Limited, IP Group plc, Lansdowne Partners (UK) LLP, Oxford University Endowment Fund, the Wellcome Trust and Woodford Investment Management LLP. Credit Suisse is acting as the sole placement agent.

6. Cambridge Innovation Capital

The Cambridge area is a textbook example of a thriving university IP ecosystem, and is now home to 19 science and business parks, 1 500 technology-based firms, employing more than 54 000 people.

CIC is a venture fund established with the support of Cambridge University and its TTO, Cambridge Enterprise. It has a broad technology mandate and a longer-than-10-year investment horizon. It announced its first three investments from a £50m fund in 2014, and currently has 10 portfolio companies.

7. SetSquared

This partnership of five universities – Bath, Bristol, Exeter, Southampton and Surrey – was ranked number one by UBI. Last year, its 260 member companies in aggregate raised more than £90m, the highest annual figure in its 14-year history, and took its cumulative total to more than £1bn. Research commissioned by SetSquared found its companies had created over £3.8bn of gross value added and 9 000 jobs in the economy of the south of England since 2004, and it expected this to rise to £8.6bn over the next 10 years.

8. Arch Venture Partners

ARCH, one of the largest early-stage technology venture firms in the US, invests in the development of seed and early-stage advanced technology companies, with a focus on commercialisation of technologies developed at academic research institutions, corporate research groups and national laboratories.

ARCH currently manages \$2 billion via eight funds, and has invested in the earliest venture capital rounds of more than 180 companies. Limited partners include major corporations, pension funds, university endowments, financial institutions, and private investors.

The partnership is led by eight managing directors, including four co-founders, supported by a team of partners, venture partners, associates, and technology specialists.

9. Osage University Partners

Osage University Partners (OUP) is a US-based venture capital fund that invests exclusively in start-ups based on commercialisation of university research. The company has firm partnerships with most US ivy-league universities.

The company has a broad technology mandate and manages some \$315m of investment capital. It has made around 50 investments (typically co-investing with other firms) and has partnered with over 70 of the most entrepreneurial universities and research centres, sharing profits with those institutions to further promote the university entrepreneurial ecosystem.

10. Gemma Frisius Fund

Gemma Frisius Fund KU Leuven (GFF) is a seed capital fund, established in 1997 as a joint venture between KU Leuven, the KBC Group and the BNP Paribas Group. The objective of the fund is to stimulate the creation and growth of university-related spin-off companies at KU Leuven by:

- providing seed capital in the very early phases of research-based spin-off companies;
- combining the research and technology transfer expertise of the university with the financial and investment expertise of financial partners.

The Gemma Frisius Fund provides seed capital in the early phases of research-based spin-off companies. The investment mandate is broad, allowing any opportunity in which the IP of KU Leuven can be valorised in a spin-off company to be funded. Since the establishment of the fund in 1997, more than 40 portfolio companies have been supported.

KU Leuven Research & Development (LRD) also utilises an extensive network of local and international investors, whose assistance is often sought to raise capital from strategically selected consortia of investors, who often participate in subsequent capital rounds.

11. University of California

In 2014, the University of California Board of Regents approved the creation of an independent venture fund that would launch with \$250 million, and primarily invest in start-ups that emerge from UC research. The fund was seeded from the university's endowments, and did not utilise tuition or state funds.

ADDENDUM A: Venture Capital Partnerships with Universities *continued*

12. Epidarex

Epidarex is a VC fund manager with offices in the UK, US and Japan, focusing on partnering with scientists and entrepreneurs, with a particular emphasis upon innovations spun out of universities. They invest in all areas of health science from their reservers of some \$260m.

In 2015, the company closed a £50m fund focusing on diagnostics, devices and novel therapeutics, with a range of backers including pharma giant Eli Lilly, the Strathclyde Pension Fund and four British university endowments.

13. MTI Partnership LLP

MTI has offices in the UK and in the US. Its portfolio of investments includes global companies in the Cleantech & Materials Technology and Medical Technology sectors. The company focuses on early-stage companies, associated with, or spun-out from, universities.

Together with international technology commercialisation specialists Core Technology Ventures, MTI has formed TransTech Capital to raise €100 million for investment in high tech companies to facilitate their collaborations with Turkish enterprises. The Fund will be managed by a combined British and Turkish Team based in London and Istanbul.

This model is worth investigating in SA.

14. Parkwalk

Parkwalk is a London-based independent investment management firm seeking to exploit the tax relief provided by the Enterprise Investment Scheme (EIS). The portfolio is focused on the UK's leading universities and other research-intensive institutions. The company utilises academic, technology transfer, venture capital and personal networks developed over many years to gain access to the highest calibre deal flow.

Parkwalk manages a series of funds, amongst these are funds closely associated with top universities:

- University of Cambridge Enterprise Funds, launched in conjunction with Cambridge Enterprise.
- University of Oxford Isis Funds, launched in conjunction with Isis Innovation.
- University of Bristol Enterprise Funds, launched in conjunction with the University of Bristol's TTO, the Research and Enterprise Development Division.

15. Allied Minds

Allied Minds plc is an American investment firm, listed on the LSE, and is a constituent of the FTSE 250 Index. They are affiliated with 160 universities and federal laboratories. "Our investors are aligned with our vision that cutting-edge invention is an attractive, yet under-developed, asset class"

The investment mandate is broad.

The company went public in 2014. Its share price rose from 190p to 684p in nine months, reporting revenues from the portfolio companies for 2015 of \$3,2m. Its current market cap is around £600m. During 2015, \$102,8 million was invested in its portfolio companies.

16. Amadeus Capital Partners

Amadeus Capital Partners is a global technology investor. It has raised over \$1bn for investment and backed more than 100 companies in the software, mobile, internet, cyber security and medical technology sectors. The investment team is based in India, South Africa, Sweden, UK and USA, has deep experience in technology and invests in high-growth companies from early stage to pre-IPO.

Major businesses built by Amadeus include Lastminute.com, the CSR (LSE:CSR), a connectivity, audio, imaging and location semiconductor company; Solexa, the developer of next generation genetic analysis systems, Octo Telematics, the global leader in insurance telematics services acquired by Renova Group; and Transmode (ST:TRMO), an optical networking solutions business.

On 3 February 2016, Amadeus announced a \$40m investment in South African Travelstart in partnership with MTN.

17. Triton Technology Fund

A group of alumni of the University of California, San Diego have created a venture capital fund—the Triton Technology Fund—that is specifically focused on commercialising innovations by UC San Diego faculty, students and alumni. This Fund will offer an additional option for UC San Diego innovators looking for the investment and expertise that is often crucial for successful technology commercialisation.

The fund is small, around \$8m, but it illustrates the viability of even a single large campus for specialist venture capital attention.



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