South African Research Environment and Intellectual Property Rights on Publicly Financed Research and Development Act

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Overview

- The Innovation Hub
- Research and Innovation
- Intellectual Property Rights from Publicly Financed Research and Development Act
- Concluding Remarks
Introduction: The Innovation Hub
Introduction: The Innovation Hub

Science and Technology Park
Catalyst for socio economic development through innovation

Strategic Objectives:
Promote socio-economic development and competitiveness of Gauteng through innovation:
• foster entrepreneurship and incubate new innovative companies
• create new business opportunities & add value to mature companies in high-tech sectors
• generate knowledge-based companies and jobs
• build attractive spaces for emerging knowledge workers
• enhance synergy between industry, government, academic
RESEARCH AND INNOVATION
Research and Innovation:
South Africa’s Innovation Policy Milestones

NSI Challenges:
- Existence of innovation “Chasm”
- Fragmentation of instruments
- Narrow definition of Innovation

Foundation for Technological Innovation (FTI)

R&D Strategy

Techology Foresight Studies

S&T White Paper

The “Knowledge Economy”:
- Knowledge = basic form of capital
- Economic growth driven by innovation

10 Year Innovation Plan

Creation of DST

TIA Act 2008

IPR-PFRD Act


THE INNOVATION HUB®

DEPARTMENT OF ECONOMIC DEVELOPMENT
GAUTENG PROVINCIAL GOVERNMENT, SOUTH AFRICA
Research and Innovation: South Africa and Knowledge Based Economies

- Relatively low number of innovation related inputs (science and engineering graduates, researchers, innovation enabling skills)
- Relatively low number of outputs and markers (scientific research, patent production and expenditure on R&D)
- Higher than average dependence on innovation being funded and driven internationally
- Business sector accounts - 44% of gross domestic expenditure on R&D (GERD)

SA is out of kilter with international norms & this can have severe long-term consequences

Source: OECD Science, Technology and industry Outlook, 2008
Research and Innovation: R&D Intensity

The evolution of R&D intensity
GERD as a percentage of GDP, 1996 (or earliest available year) and 2007 (or latest available year), countries with R&D intensity below 1.5% in both years.

- R&D intensity up
- R&D intensity down

Expenditure on R&D as a % of GDP, 1996


Source: UNESCO Institute for Statistics, September 2009
Research and Innovation:
Funding: Innovation Landscape

The Missing Middle

The Time Bomb

NRF / SETI Core

THRP

IDC / SPII / NEF

Private Equity

“Classic VC”

“Intermediate VC”

PPP’s

Revenues

Adapted from DST, 2012
Research and Innovation:
Funding: R&D Expenditure at Higher Education Institutions

- **Research Funding sources:**
  - Government
  - Private sector
  - Donor organisations

- **< 1/3 of higher education institutions**
  - R&D budgets in excess of R300m

- **Business sector:**
  - 44% of gross domestic expenditure on R&D (GERD)

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Source: Human Sciences Research Council

*Sibanda, M: in THE ECONOMICS OF INTELLECTUAL PROPERTY IN SOUTH AFRICA, edited by WIPO, 2009*
2002 R&D Strategy:
– Need to renew research capacity

OECD, 2010:
– Human resources for science and technology low

NRF’s South African PhD Project
– Number and diversity of South Africans with research doctorate degrees

Investment in research PhD capacity should yield increase in research output

1996-2007, scientific articles from the BRICS (Brazil, the Russian Federation, India, Indonesia, China and South Africa) more than tripled…”

Source: OECD Innovation Strategy: Getting a Head Start on Tomorrow, 2010
Research and Innovation: 
Research Outputs: *University Publications*

- Increase since 2000
- Dominance by 8 higher education institutions
- Mandate of higher education institutions
- Higher publications per higher-education institution than patent filings
- Correlation between R&D expenditure and publication output

Source: Pouris, 2008

*Sibanda, M: in THE ECONOMICS OF INTELLECTUAL PROPERTY IN SOUTH AFRICA, edited by WIPO, 2009*
Research and Innovation: Research Outputs: *Domestic Patenting by Institutions*
INTELLECTUAL PROPERTY RIGHTS FROM PUBLICLY FINANCED RESEARCH AND DEVELOPMENT ACT
The World Economic Forum Global Competitiveness Report indicates a correlation between the protection of intellectual property rights and national competitiveness. In 2004, the 20 countries that were perceived as having the most stringent intellectual property protection were classed among the top 27 in the WEF’s growth competitiveness index. Conversely, the 20 countries perceived as having the weakest intellectual property regimes were ranked among the bottom 36 for growth and competitiveness.
The intellectual property system was an important catalyst for the development of indigenous technology by Korean companies, several of which have become global market leaders. Korea’s spectacular transformation from a poor farming economy in the 1960s with a per capita income of less than US $100 to a highly industrialized country with a per capita income of US $12,000 today, resulted from a systematic economic and trade development policy that included incentives for technological innovation and the development of domestic intellectual property assets.

Chulsu Kim, Integrating Intellectual Property into the National Development Policy: the Korean Experience, keynote address at WIPO/ KIPO Ministerial Conference on Intellectual Property for Least Developed Countries
Prior to Bayh-Dole, government used to own intellectual property developed in university and federal laboratories.

Bayh-Dole Legislation
- Ownership with universities and federal laboratories – institutional IP Policies
- Empowered to commercialise their intellectual property and innovations
- Preference for SME
- Substantial manufacture in the USA
Universities creating 1.25 new products a day

Campus patenting 495 issued patents in 1980
3,278 issued patents in 2005

4,932 academic licenses in 2005
28,349 active licenses overall

Biotechnology industry rooted in academic research

Nanotechnology following similar trend

From: Joe Allen, USA, Ex-staffer to Senator Bayh,
Drivers for managing IP (2002 R&D Strategy)

- Differences in **patent rates** represents one of the greatest “divides” of the knowledge age

- Intellectual Property:
  - Instrument for wealth creation
  - Must generate social & economic benefits to Republic
  - Innovation, diffusion of scientific and technical knowledge
  - Market competitiveness

- Legislative framework for IP from publicly financed R&D
  - Clear rights & obligations
Disparate policies on IP ownership and commercialisation
- Loss of IP to foreign jurisdictions - little benefit to public
- Poor commercial practices - IP sitting on shelves
- IP as instrument for wealth creation / social development

No balance of incentives and regulation

Unbalanced relationship in negotiation of IP arrangements
- Universities, research institutes and business

Low public spending accountability
### IPR-PFRD Act:

**Background:** *Institutional Arrangements*

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- Different approaches to intellectual property management:  
  - Ownership  
  - Commercialisation
- Most had no intellectual property policy
- Capacity to manage intellectual property
- Not all are research institutions
- Science Councils / HEIs

*Sibanda, M: in THE ECONOMICS OF INTELLECTUAL PROPERTY IN SOUTH AFRICA, edited by WIPO, 2009*
Intellectual property (patents) must be secured on the outputs of publicly financed research

- Obligation to disclose potential IP
- Government can secure IP if institution does not

Obligations and benefits are linked

- Ownership
- Obligation to commercialise

Individuals and institutions have defined rights

- Ownership
- Benefit sharing
Certain patents can be secured to protect public interest and will not be licensed on commercial terms.

Preferences in commercialisation:
- non-exclusive licensing
- local licensing
- SMMEs and BEEs as licensors

Government has walk-in rights on publicly financed IP in the national interest – free licence.

Revenue to institutions will grow but it is not expected to be a major source of finance at the system level.
IPR-PFRD Act:
Background: Guiding Principles

- Consistent approach in protection of IP
- Benchmark against good global practice and contextualise for local efficacy
- Identify key rights, functions & obligations
- Good balance between incentives and control
- Certainty in terms of publicly financed IP
- Must not hinder private-public collaborations
IPR-PFRD Act: Definitions: *Intellectual Property*

“intellectual property means any creation of the mind that is capable of being protected by law from use by any other person, whether in terms of South African law or foreign intellectual property law, and includes any rights in such creation, but excludes copyrighted works such all a thesis, dissertation, article, handbook or any other publication which, in the ordinary course or business, is associated with conventional academic work”

- **Broad definition**
  - based on World Intellectual Property Organisation (WIPO) definition

- **Reference to foreign law**
  - Recognition of territoriality of intellectual property rights

- **Exclusion of ‘conventional academic work’**
  - Ensure no interference with academic freedom
  - Assumption that value assessment would have been done by time of publication, thesis, etc.
“The object of this Act* is to make provision that intellectual property emanating from publicly financed research and development is:

- identified;
- protected;
- utilised and commercialised for the benefit of the people of the Republic.”
IPR-PFRD Act: Key Provisions

**Disclosure and Ownership of Intellectual Property**
- Recipient has title to IP
- Obligation to protect
- NIPMO may in national interest where recipient elects not to proceed

**Institutional Arrangements**
- National Intellectual Property Management Office (NIPMO)
- Office of Technology Transfer

**Co-financed R&D**
- Option to exclusive licence
- Joint Ownership possible

**Benefit Sharing Arrangements**
- > 20% of initial gross revenues
- > 30% of nett revenues

**Government Rights**
- Non-exclusive licence for national need
- Non-commercialisation
- Assignment in case of non-disclosure

**Local IP Transactions**
- Licences no approval required
- Assignment: NIPMO Approval

**Off-shore IP Transactions**
- Exclusive Licences & Assignments require approval
- Capacity in and benefits to Republic

**Full Cost R&D**

**Regulations, 2010**
IPR-PFRD Act:
Key Provisions: *NIPMO*
Concluding Remarks … 1/2

- **Funding Mechanisms**
  - Inadequate funding of basis and applied research being undertaken to feed the innovation pipeline

- **Impact of IPR-PFRD Act:**
  - Research Cooperation
  - Industry Participation at institutions
  - Level of foreign funding
  - Publications / Patents / Copyright

- **Coexistence of Patents and Publication**
  - Delays in publication necessitated by novelty requirements
  - Two forms of disseminating research results
  - Researchers incentives based on publication – awareness important
South Africa must adequately renew its human resources for science and technology, “by younger groupings more representative of our demographics”

SKA Project

- Significant opportunities for development of critical human resources to support South Africa’s research and innovation system in the future

South Africa poised to be a significant player in global arena in terms of research and innovation

- R&D expenditure
- Publications and intellectual property
- Innovation and global competitiveness
THANK YOU

The Innovation Hub
- Innovation catalyst for a smart province: Gauteng -