



**HSRC**  
Human Sciences  
Research Council

**CeSTII**  
Centre for Science, Technology  
& Innovation Indicators

## **How much R&D and innovation goes on in South Africa, and how do we know this?**

Glenda Kruss & Moses Sithole | Industry Association Innovation Day 2018

# Key questions

**1. Why R&D and innovation data is important**

**2. How much R&D and innovation goes on in South Africa – and is it sufficient?**

**3. How can industry associations use STI data to inform their technological capacity building activities?**

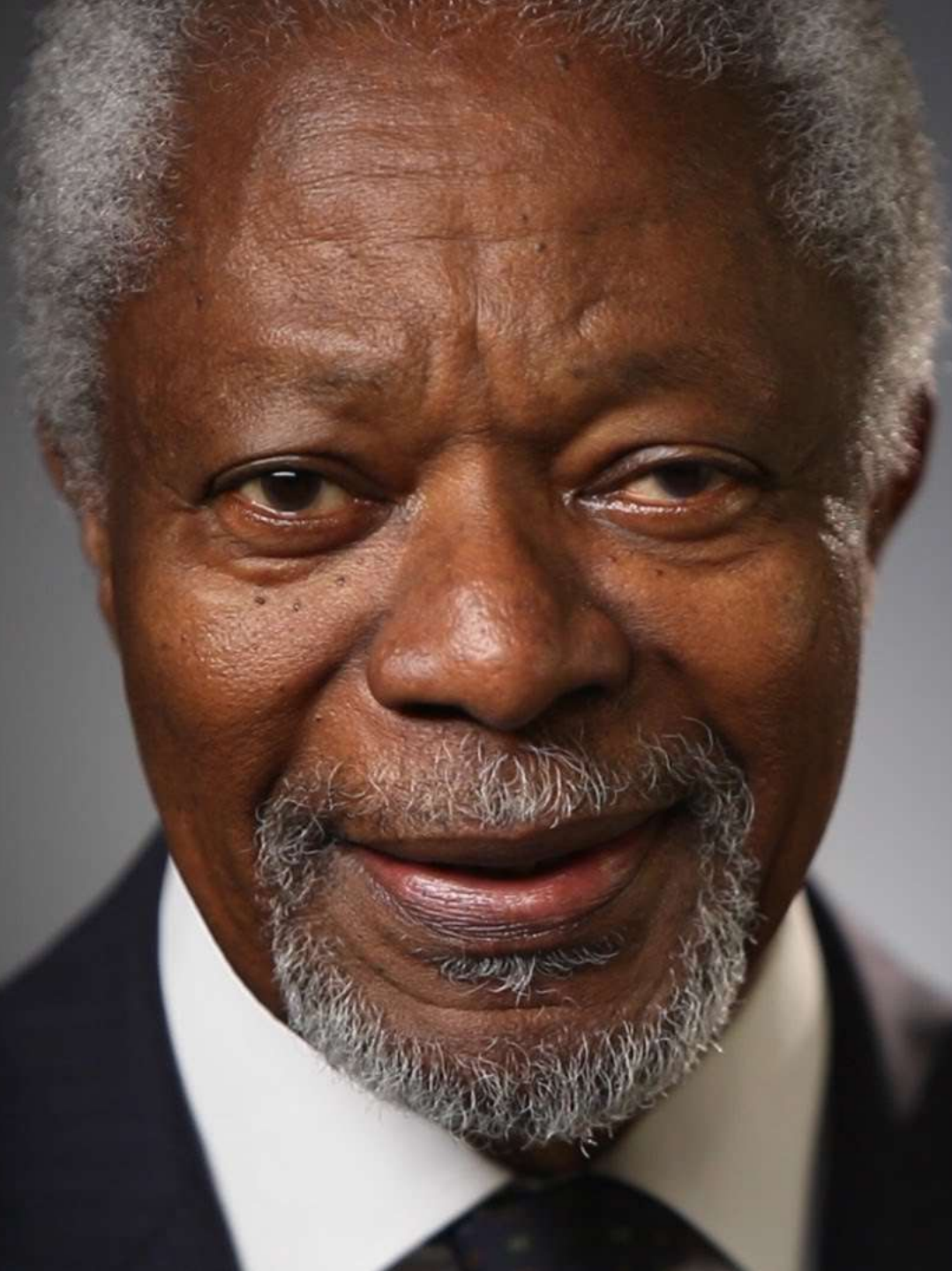
**4. Why is R&D and innovation survey participation important?**

# 1. Why R&D and innovation data is important



**“South Africa’s prosperity as a nation depends on our ability to take advantage of rapid technological change. This means that we urgently need to develop our capabilities in the areas of science, technology and innovation.”**

- President Cyril Ramaphosa, State of the Nation 2018



“Governing  
without data is  
like driving  
without a  
dashboard.”

- K. Annan

2. How much R&D and innovation goes on in South Africa, and how do we know this

# Science, technology and innovation statistical production in SA



# Centre for Science, Technology and Innovation Indicators, HSRC

## SA National Survey on Research and Experimental Development (R&D Survey)

- Methodology: OECD Frascati Manual
- Official Statistics
- Stats SA through SASQAF sets quality criteria/standards
- CeSTII has completed **14** annual R&D surveys on behalf of DST
- **2016/17 Survey in field**



## South African Business Innovation Survey (BIS)

- Methodology: OECD Community Innovation Surveys; Oslo Manual
- SA BIS 2005 for the period 2002-04
- SA BIS 2008 for the period 2005-07
- SA BIS 2013 for the period 2010-12
- **BIS 2014-16 in field**



# How much do we spend on R&D every year?



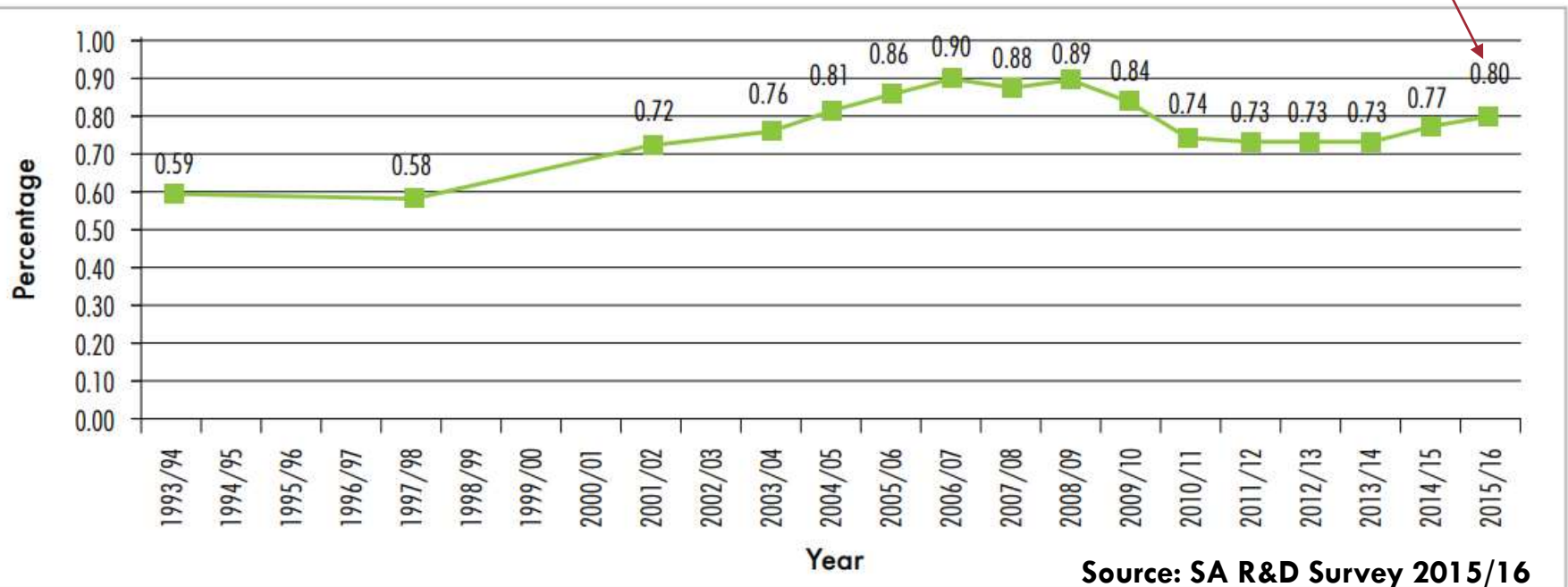
# How much do we spend on R&D every year?

**GERD** = Gross Domestic Expenditure on Research and Experimental Development

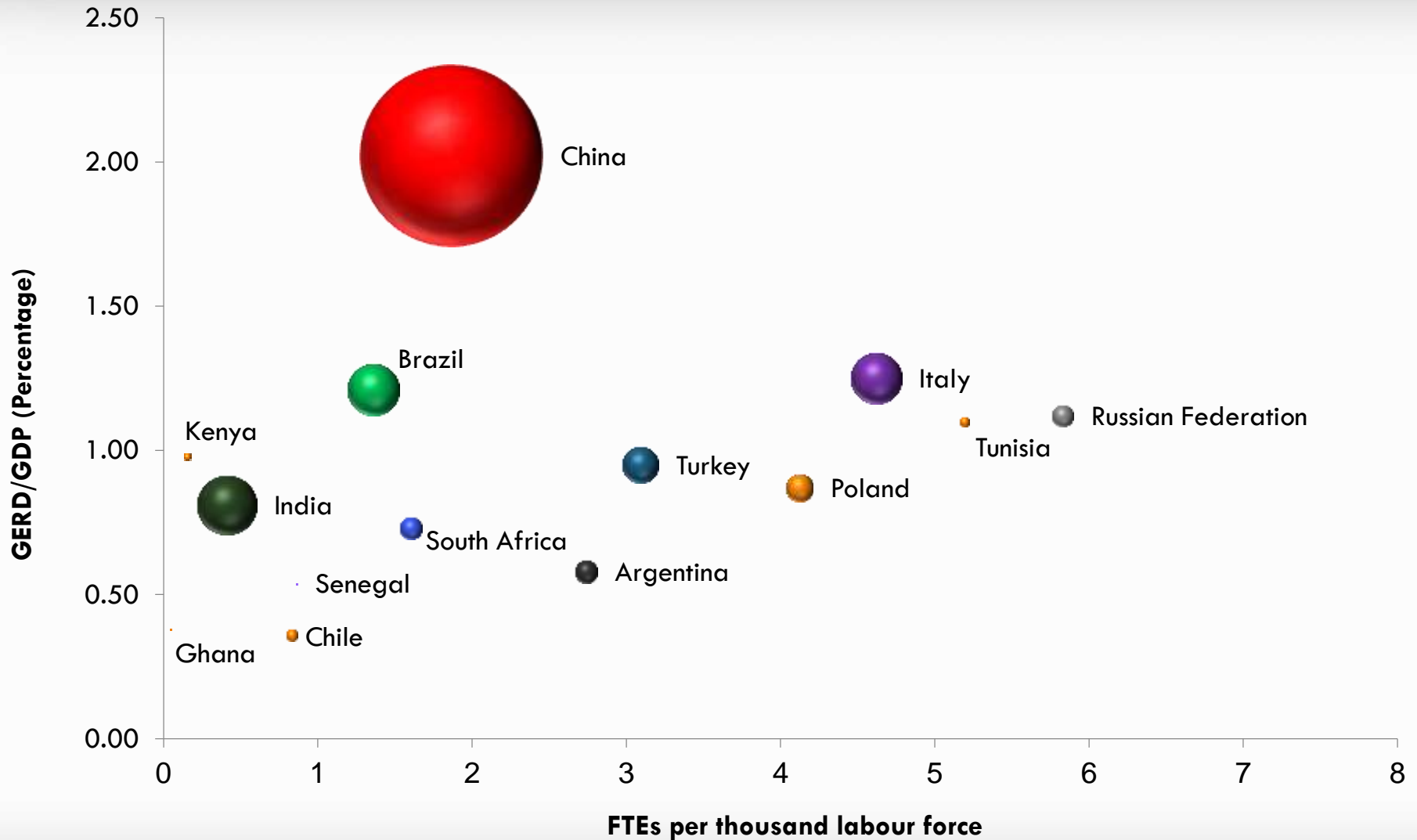
National target = 1.5% GERD / GDP

2015/16

GERD as a percentage of GDP, South Africa, 1993/94 to 2015/16



# How do we compare with our peers globally?



# How much and what kinds of innovation take place?



# STATE OF INNOVATION IN SOUTH AFRICA\* 2007



WHAT WE FOUND:

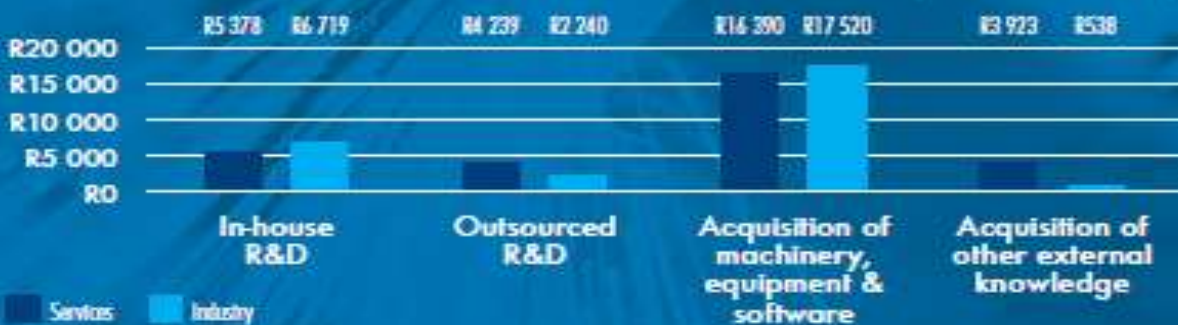
**65,4%** of SA BUSINESSES were



**INNOVATION ACTIVE**

THE AVERAGE BUSINESS SPENT **1.70%** OF ITS TURNOVER ON INNOVATION

## BREAKDOWN OF INNOVATION SPEND (in millions)



## TOP 5 EFFECTS OF INNOVATION ON BUSINESS GOALS

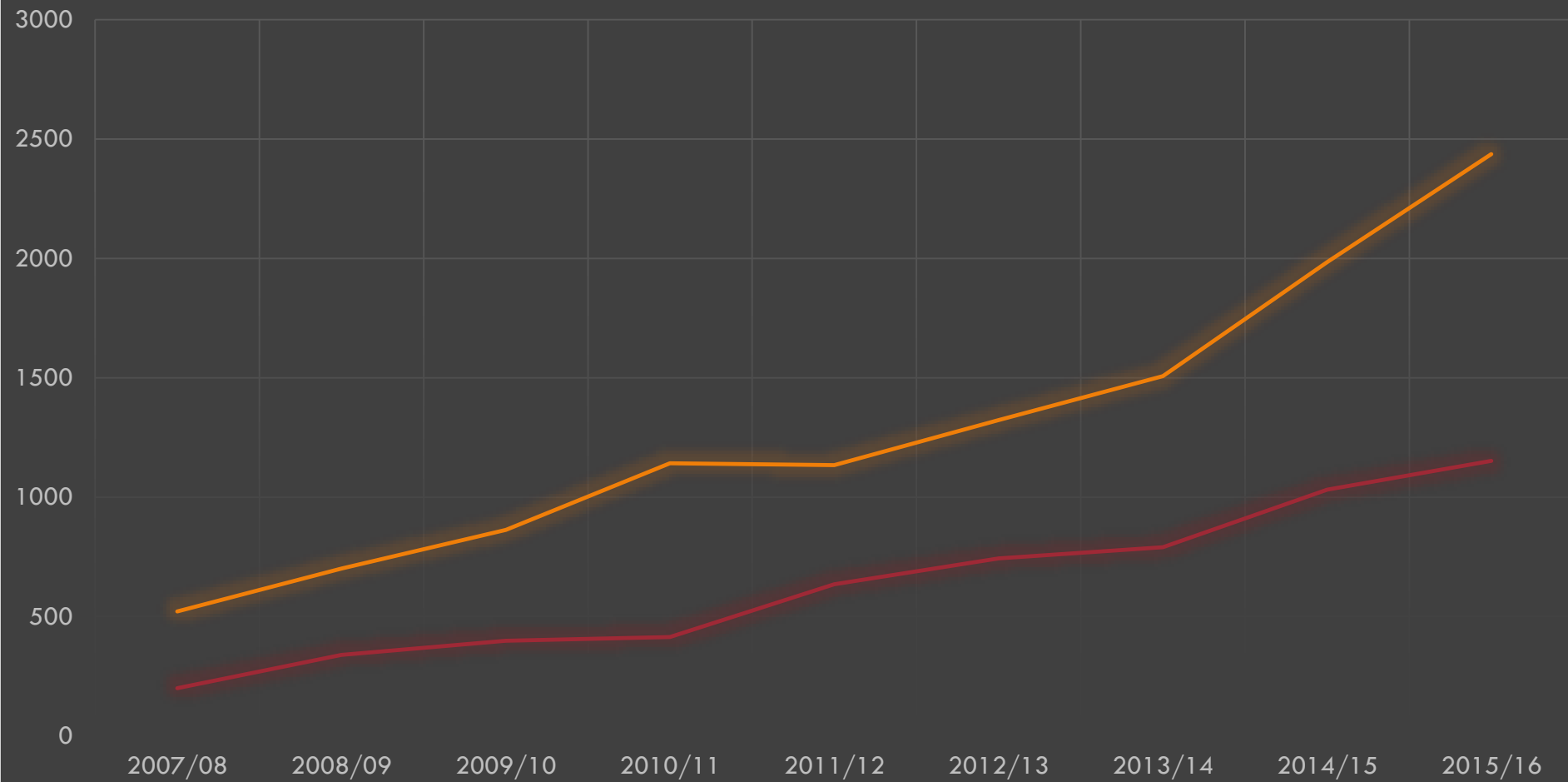
- Increased range of goods and services
- Improved quality of goods or services
- Increased capacity of production or service provision
- Entered new markets or increased market share
- Improved flexibility of production or service provision

3. How can industry associations use STI data to inform their technological capability building activities?

# Example 1: Assessing R&D expenditure in a sector

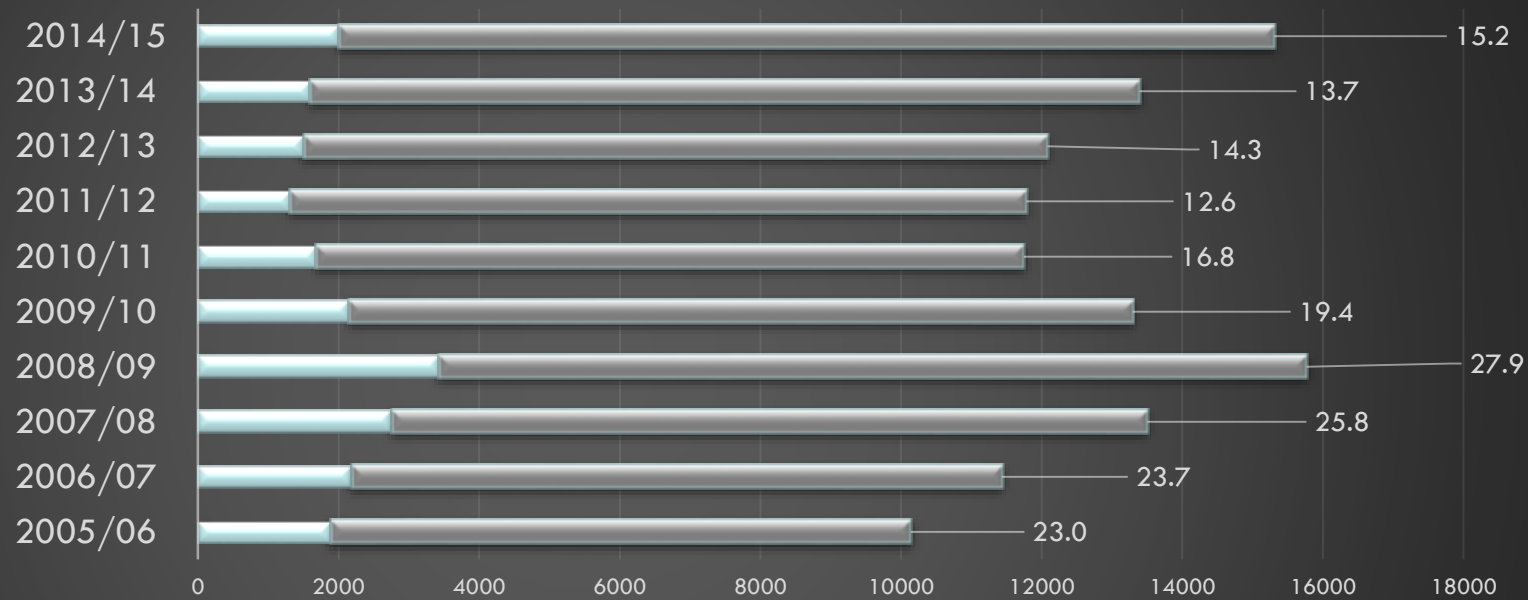
Real Expenditure on Biotech and Nanotech Research (2007/08 to 2015/16)

BIOTECHNOLOGY R mill.      NANOTECHNOLOGY R mill.



# Is the sector spending sufficiently?

**R&D Expenditure of SOEs as a Component of BERD, 2005/06 to 2014/15**



	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
SOE R&D EXPENDITURE (Rm)	1896	2195	2766	3439	2158	1686	1318	1512	1610	2020
BERD (Rm)	8244	9243	10738	12332	11139	10059	10464	10571	11783	13291

■ SOE R&D EXPENDITURE (Rm)    ■ BERD (Rm)



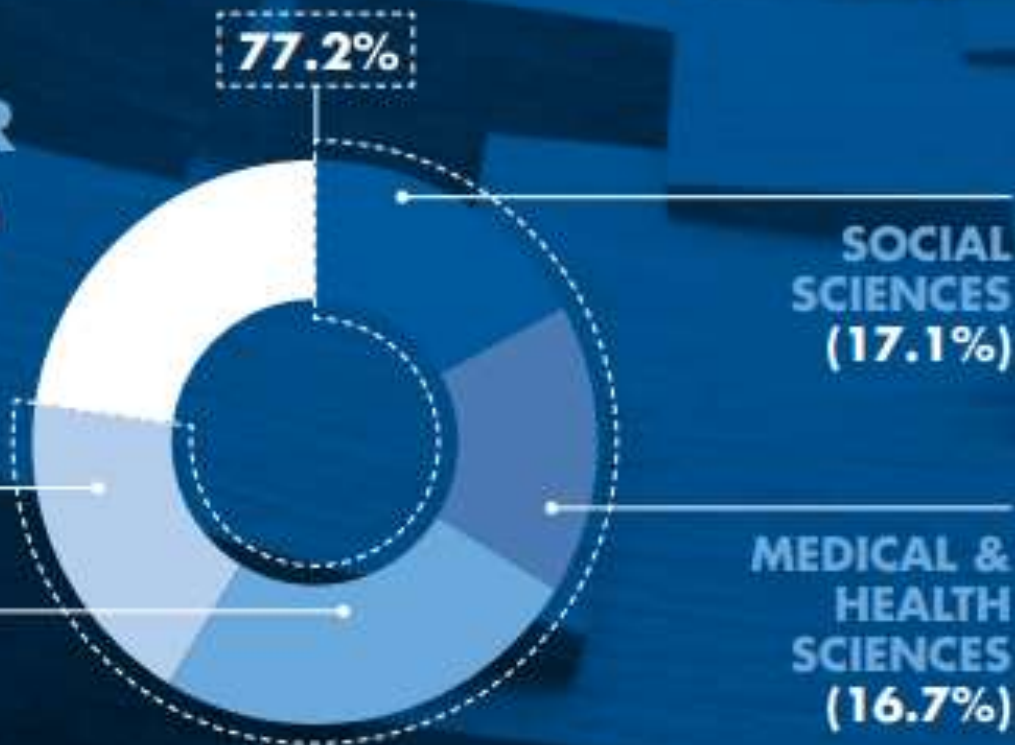
IN 2015/16  
**82.9%** OF **BUSINESS  
R&D INVESTMENT**  
WAS DEVOTED TO



**77.2%** OF  
**PRIVATE SECTOR  
R&D** WAS FOCUSED  
ON THE FOLLOWING  
RESEARCH FIELDS

ICT (18.6%)

ENGINEERING  
SCIENCES (24.8%)



SOCIAL  
SCIENCES  
(17.1%)

MEDICAL &  
HEALTH  
SCIENCES  
(16.7%)

# Example 2: Assessing R&D expenditure by issue



SOUTH AFRICAN NATIONAL  
SURVEY OF RESEARCH  
AND EXPERIMENTAL  
DEVELOPMENT

**GREEN R&D**  
**at a glance 2015/16**

at a glance 2012/13

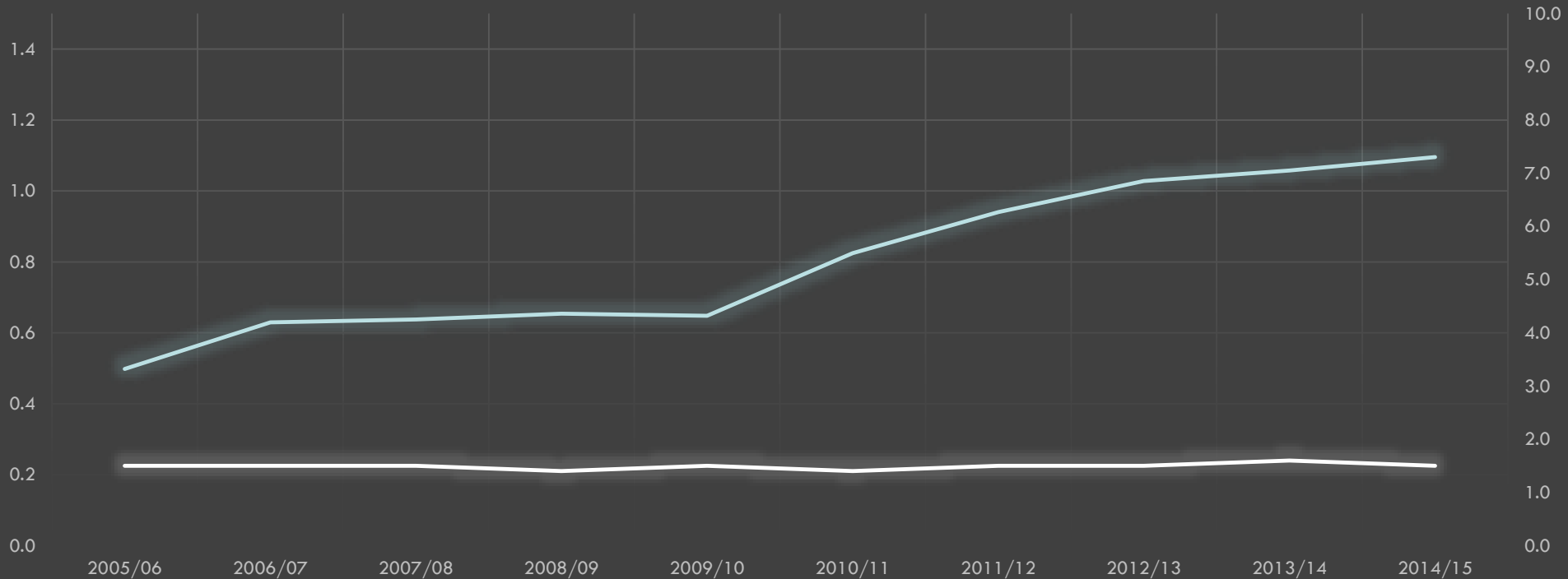
GREEN R&D

# Example 3: Assessing human resources for R&D

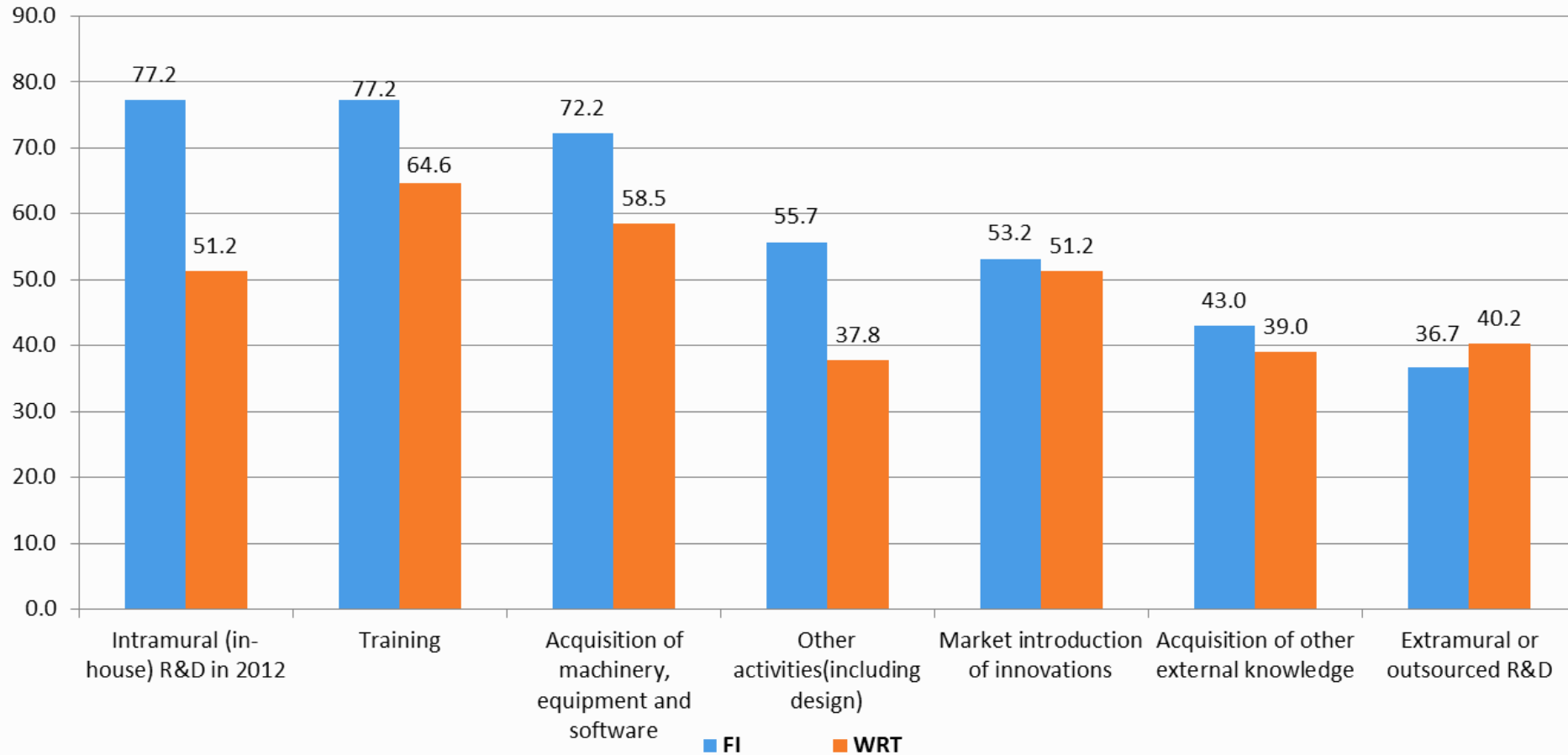
Technician to Researcher Ratio of SOEs, and Researcher FTEs per 1000 Employed

— SOE SECTOR TECHNICIANS: RESEARCHERS (FTEs)

— RESEARCHERS (FTEs) PER 1 000 IN TOTAL EMPLOYMENT



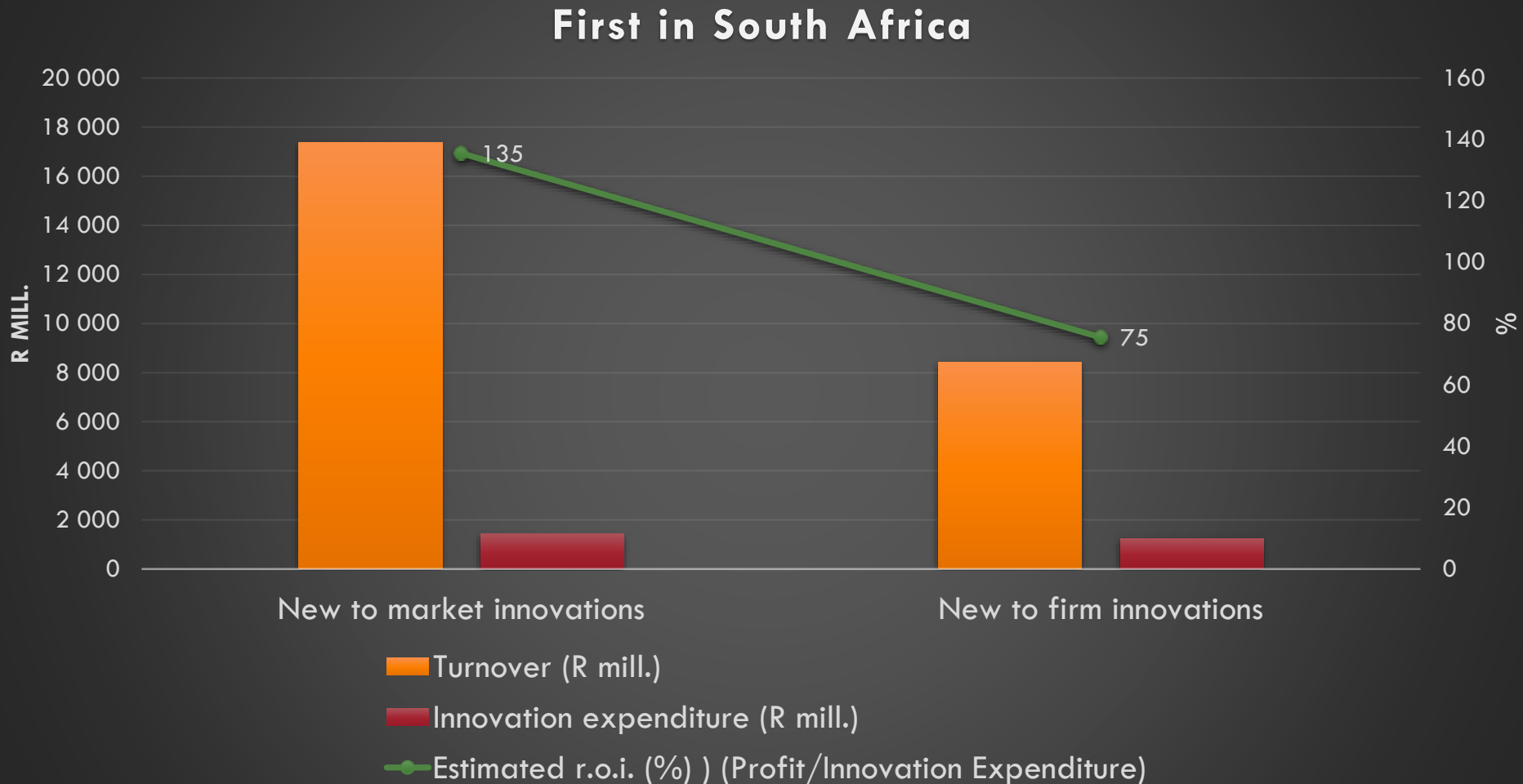
# Example 4: Understanding patterns of innovation to provide support



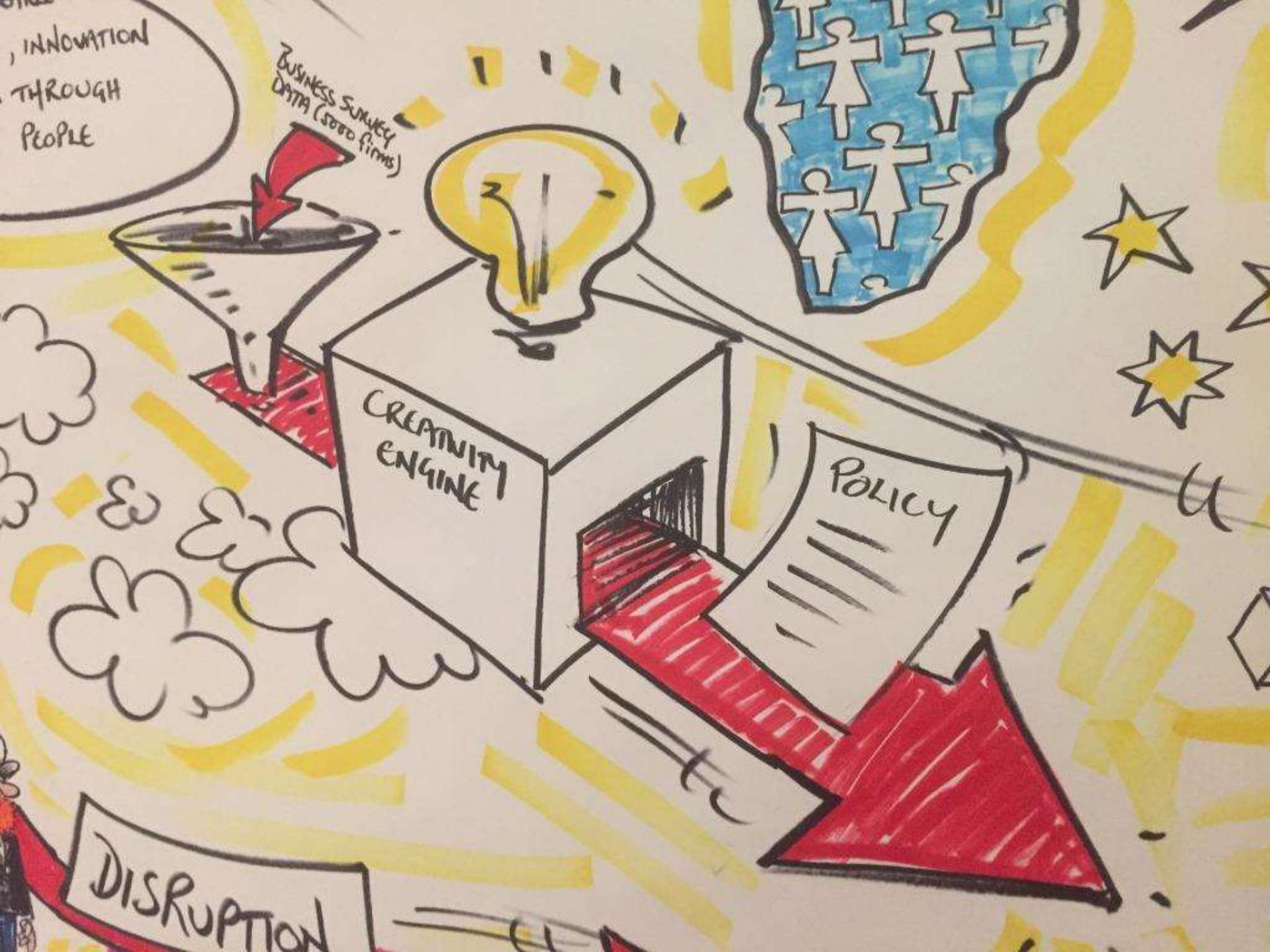
# Example 5: Understanding barriers to inform interventions

	Innovation-active WRT	Non-Innovation-active WRT	Innovation-active FI	Non-Innovation-active FI
<b>COST FACTORS</b>				
Lack of funds within your enterprise or group	19.5	9.3	24.1	17.9
Lack of finance from sources outside your enterprise	14.6	3.1	17.7	17.9
Innovation costs too high	12.2	7.2	16.5	21.4
<b>KNOWLEDGE FACTORS</b>				
Lack of qualified personnel	19.5	13.4	27.8	10.7
Lack of information on technology	7.3	5.2	15.2	3.6
Lack of information of markets	6.1	4.1	12.7	3.6
Difficulty in finding co-operation partners	9.8	7.2	7.6	3.6
<b>MARKET FACTORS</b>				
Market dominated by established enterprises	12.2	11.3	16.5	25.0
Uncertain demand for innovative goods or services	8.5	9.3	20.3	25.0

# Example 6: Understanding returns to innovation nationally?



4. Why is R&D and innovation survey participation important?



INNOVATION THROUGH PEOPLE

BUSINESS SURVEY DATA (5000 FIRMS)

CREATIVITY ENGINE

POLICY

DISRUPTION



# Business Innovation Survey 2014-2016

n = 5,000 firms

““

The **implementation** of a new **or** significantly improved:

=

- Product i.e. good or service,
- Process,
- Marketing method, and/or,
- Organisational method

An innovation can be:

- New to the firm
- New to the market
- New to the world





 **BUSINESS INNOVATION**  
**SURVEY 2014 - 2016**

**FOR A MORE INNOVATIVE SOUTH AFRICA**