

'If you can't measure it, how can you manage it?'
HE-GOV-BUS R&D collaboration
- what is the evidence?

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Social science that makes a difference



(National) Systems of Innovation

- “The NSI comprises institutions and firms and the interactions among them that generate and disseminate new products and processes.”
- Three major players: GOV, BUS and HE
- Governments provide public funds to HE & BUS:
 - Innovation is a key to growth
 - How are our incentives working?
 - What is the output?
 - How do the components relate one to another?

Measurement & Management

- How to improve monitor effectiveness and efficiency of the 'system?'
- Battery of measures and tools
 - R&D Surveys (inputs)
 - Bibliometrics, Patent & IP statistics (outputs)
 - Innovation Surveys (processes and outputs)
 - Econometric modelling
 - Case studies
 - Technology balance of payments
 - Mobility of personnel

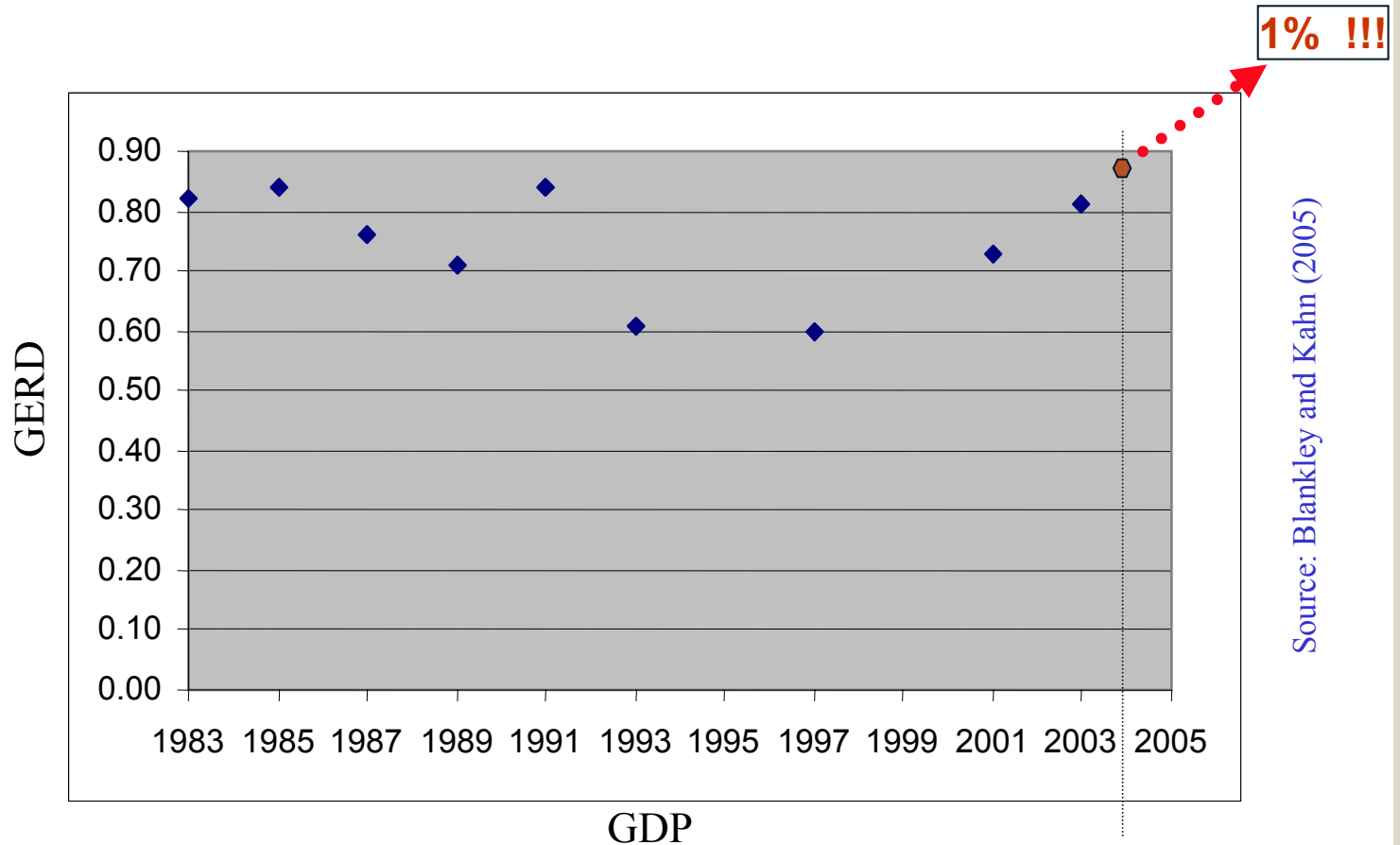
Measuring R&D

- Well established methodology 'Frascati' Manual
- Direct measure of inputs: funds and people
- Time series back to 1968
- CeSTII: 2001/02; 2003/04; 2004/05; 2005/06
- 2005 declared **Official Statistics**
- 2005 included in OECD *Main S&T Indicators*

Doing it

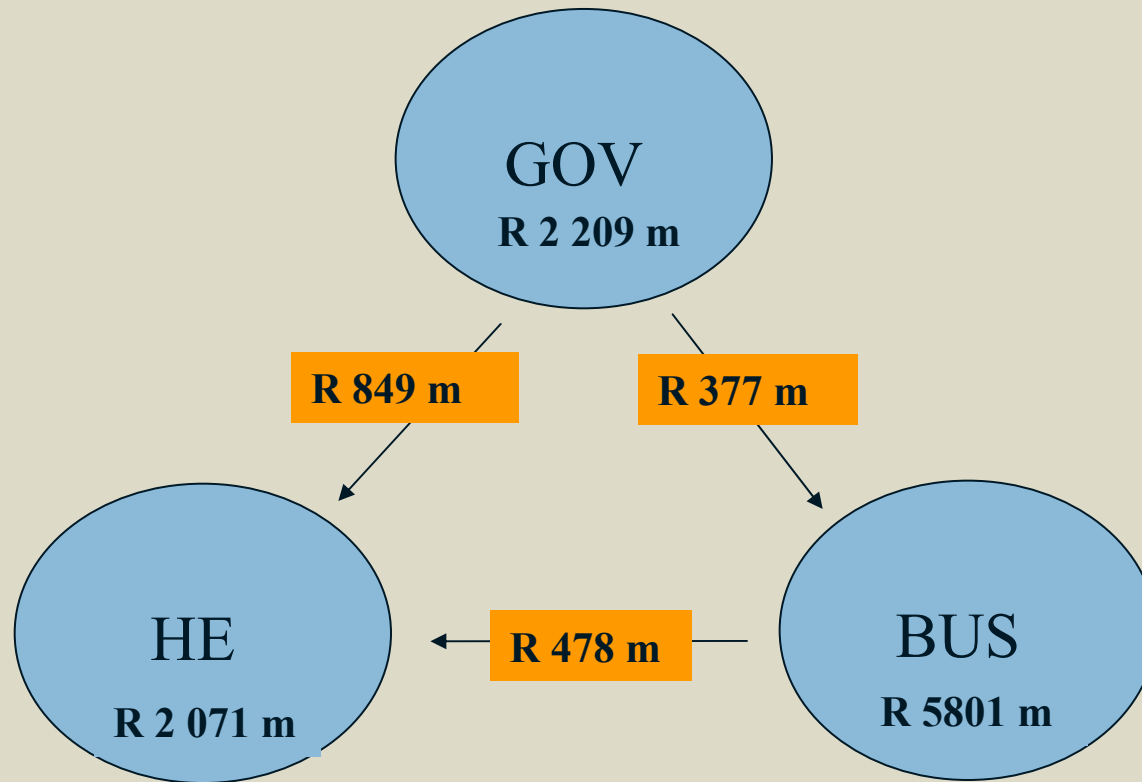
1. Definitional issues
2. Boundary conditions
3. Identification of potential respondents
4. Information management systems
5. Timely and complete responses
6. Challenge of the new tax incentive

Getting the measure of the NSI



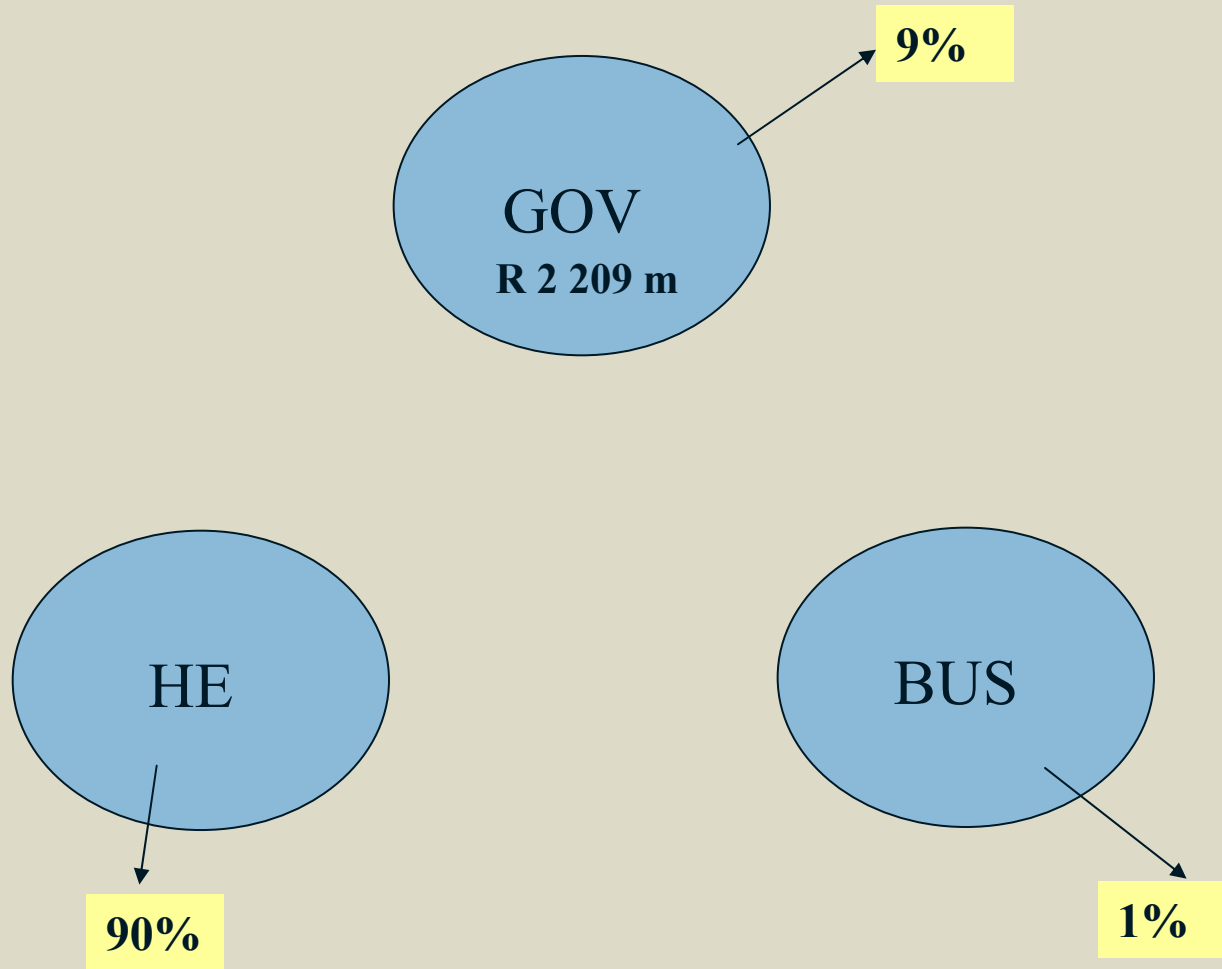
It's like collecting taxes

Flows of R&D funds in SA (2003)



Evidence of Collaboration?

Publications!




Lack of collaboration or different strokes?

2003

Gov to BUS (% of BERD)

| Country | % |
|---------------------|------|
| Russia | 51.5 |
| Spain | 11.1 |
| UK | 10.9 |
| USA | 10.0 |
| Argentina | 8.4 |
| EU_25 | 7.4 |
| South Africa | 6.4 |
| Sweden | 5.9 |
| Korea | 5.3 |
| China | 4.9 |
| Australia | 4.3 |
| Finland | 3.3 |
| Japan | 0.8 |

Moderate



International Data

Gov to HE (% of HERD)

SA

Gov to HE (R&D) / HERD = 41%

(GOVERD to GERD = 44%)

US

Gov to HE = 60%

2003

BUS to HE (% of HERD)

| Country | % (2003) |
|---------------------|-------------|
| China | 35.9 |
| Russia | 27.9 |
| South Africa | 23.1 |
| Korea | 13.6 |
| EU_25 | 6.6 |
| Spain | 6.4 |
| Sweden | 6.0 |
| Finland | 5.8 |
| UK | 5.6 |
| Australia | 5.1 |
| USA | 4.5 |
| Japan | 2.7 |
| Argentina | 0.2 |

Healthy?

Innovation in SA

Table 6.1: Innovation and the use of external information sources, percentages per source

| External source | Unimportant | Important | | | |
|-------------------------|--------------------|------------------|--|--|--|
| Group | 75 | 25 | | | |
| New personnel | 71 | 29 | | | |
| Buyers | 63 | 37 | | | |
| Suppliers | 57 | 43 | | | |
| Competitors | 49 | 51 | | | |
| Consultants | 75 | 25 | | | |
| Research labs | 91 | 9 | | | |
| Universities | 87 | 13 | | | |
| Innovation centres | 95 | 5 | | | |
| Sector institutes | 88 | 12 | | | |
| Patents | 92 | 8 | | | |
| Electronic info | 79 | 21 | | | |
| Professional literature | 55 | 45 | | | |
| Exhibitions | 53 | 47 | | | |
| | | | | | |
| | | | | | |

from South African Innovation Survey 2001

Limited, but random sample of firms

Collaboration Question

With whom is R&D conducted in partnerships, alliances or collaboration?

Tick as appropriate.

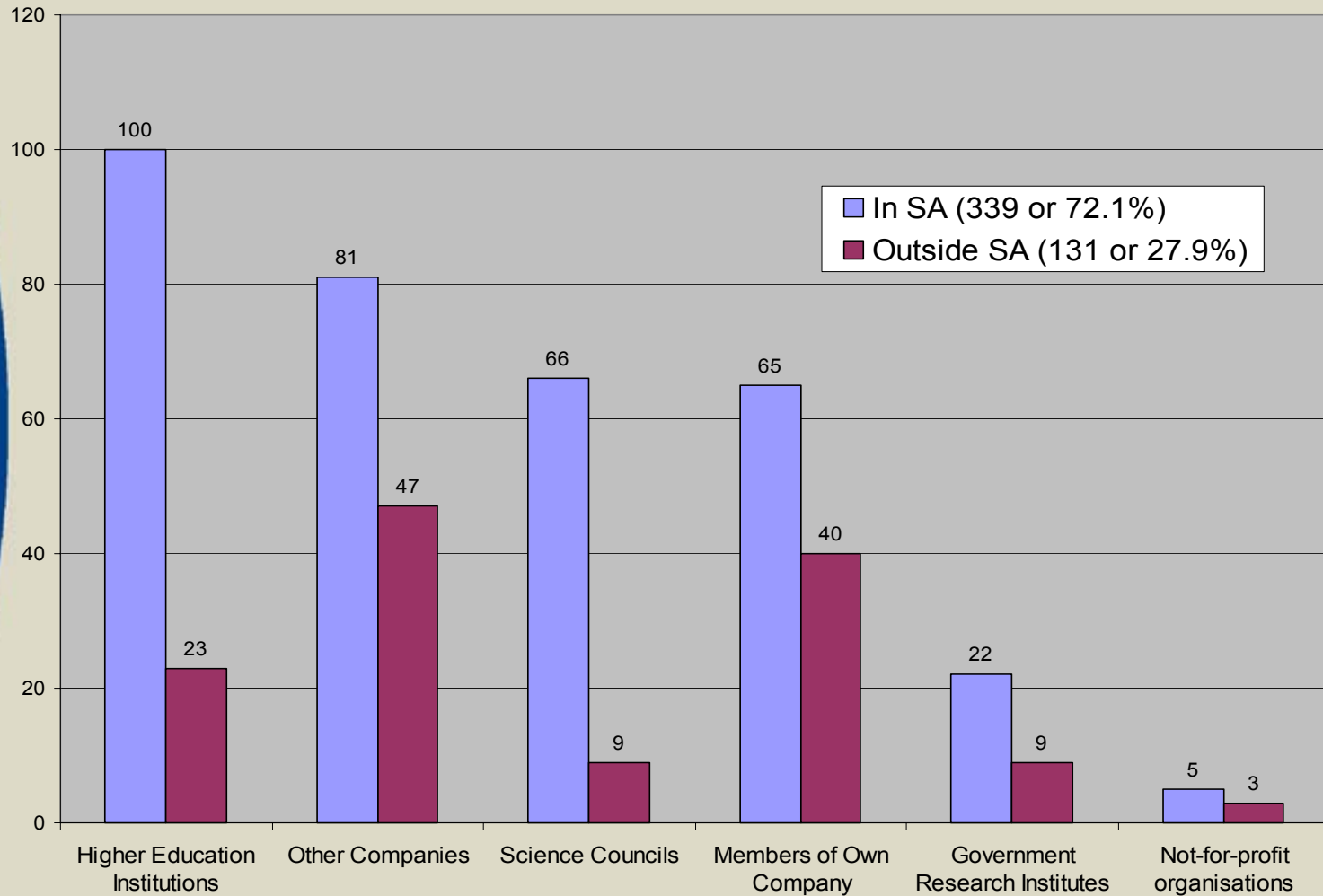
| | S A | Foreign |
|----------------------------------------------------|------------|----------------|
| Higher Education Institutions | | |
| Science Councils (e.g. CSIR, Mintek, MRC, ARC etc) | | |
| Government Research Institutes | | |
| Members of own company/ Affiliated Companies | | |
| Other Companies (including Specialist consultants) | | |
| Not-for-profit organisations | | |
| | | |

Limited, purposive sample of R&D performing firms

Responses

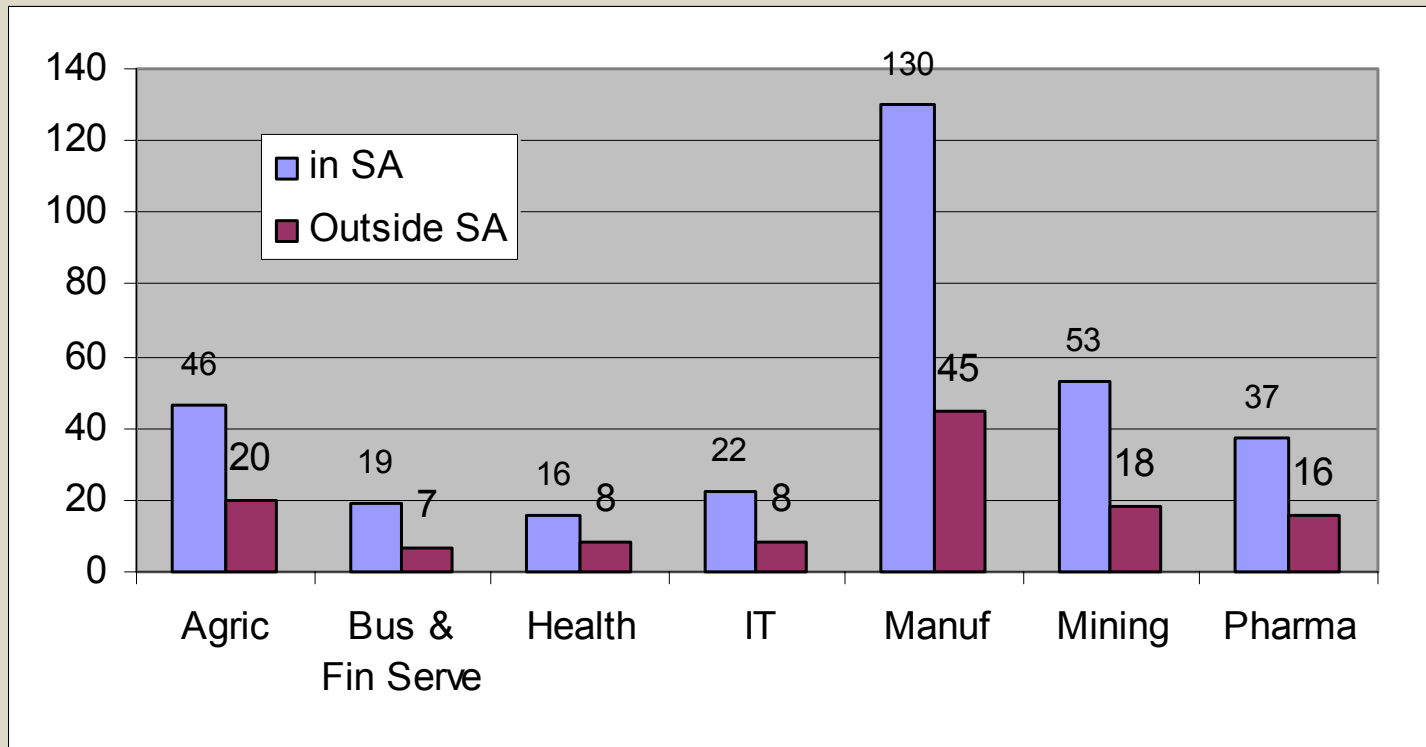
| | no. | % | Description |
|---|------------|----------|------------------------------------------------------------------|
| * | 231 | 100.0% | sample of companies |
| | 167 | 72.3% | collaborated with at least one partner in SA or Abroad |
| | 159 | 68.8% | collaborated with at least one partner in SA |
| | 84 | 36.4% | collaborated with at least one partner in Abroad |
| | 64 | 27.7% | no collaboration |

BUS R&D Collaboration links (2004)

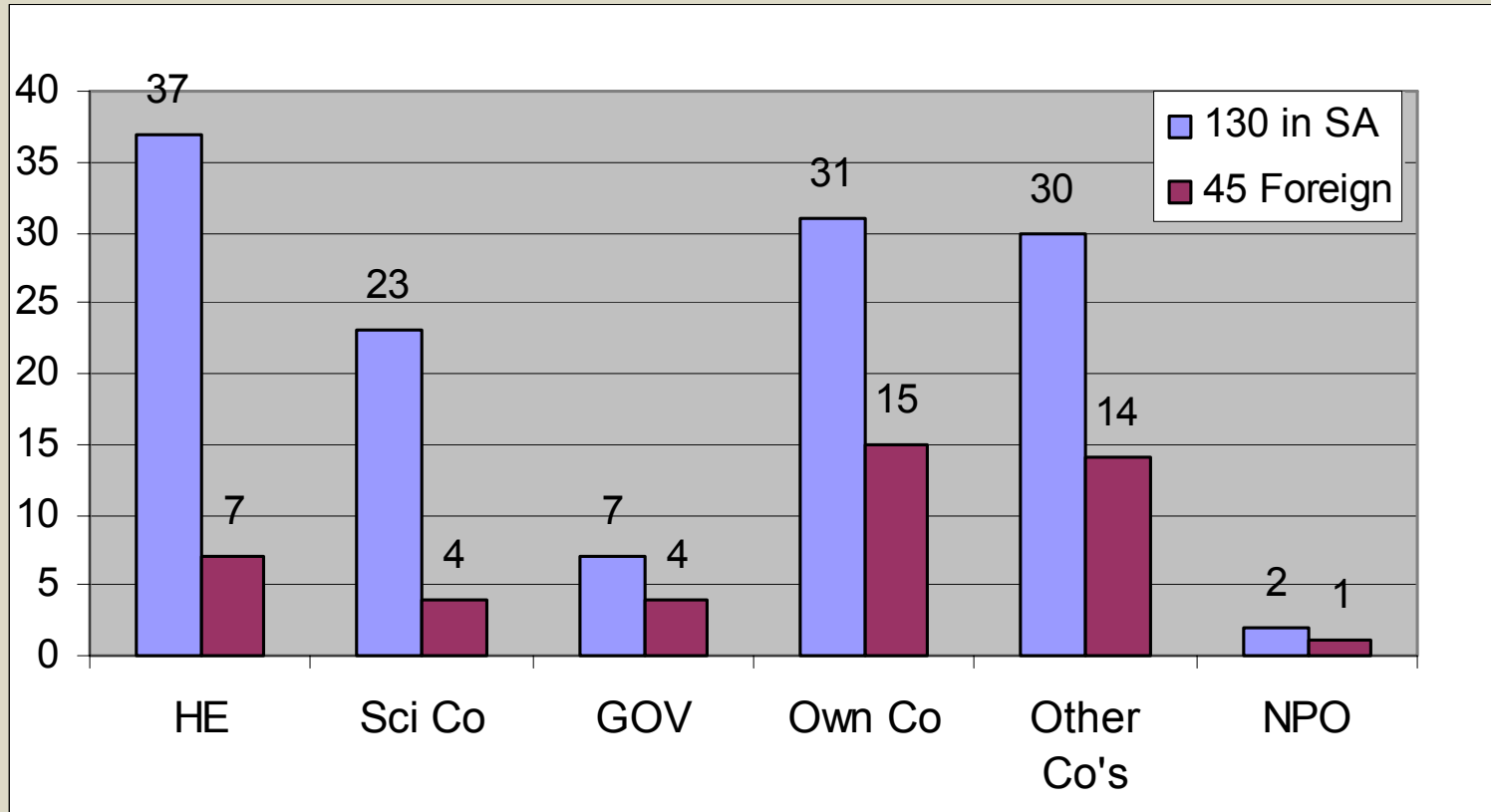


Links are not weighted

Collaboration by Industry Clusters

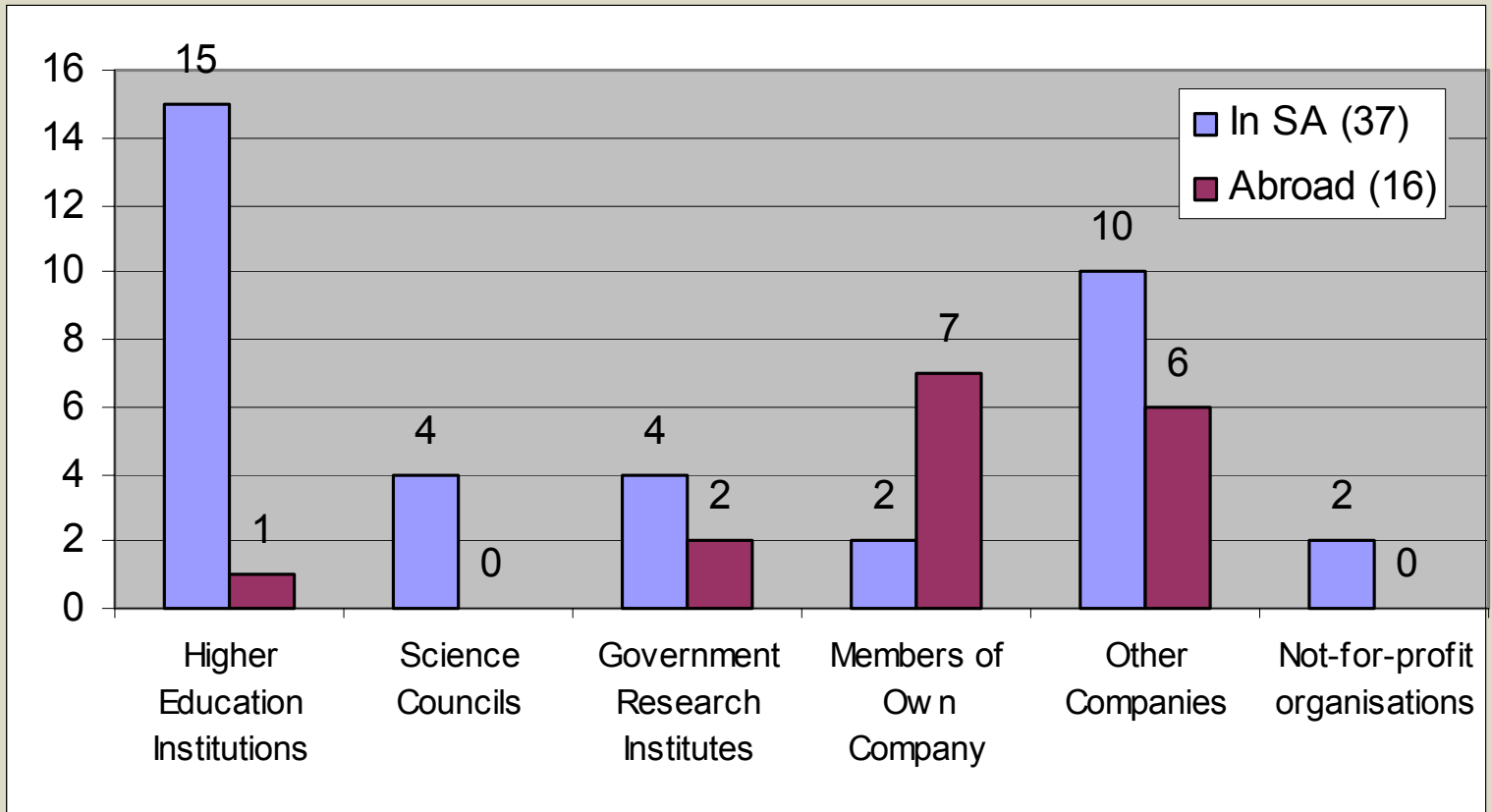


Manufacturing (65 firms)



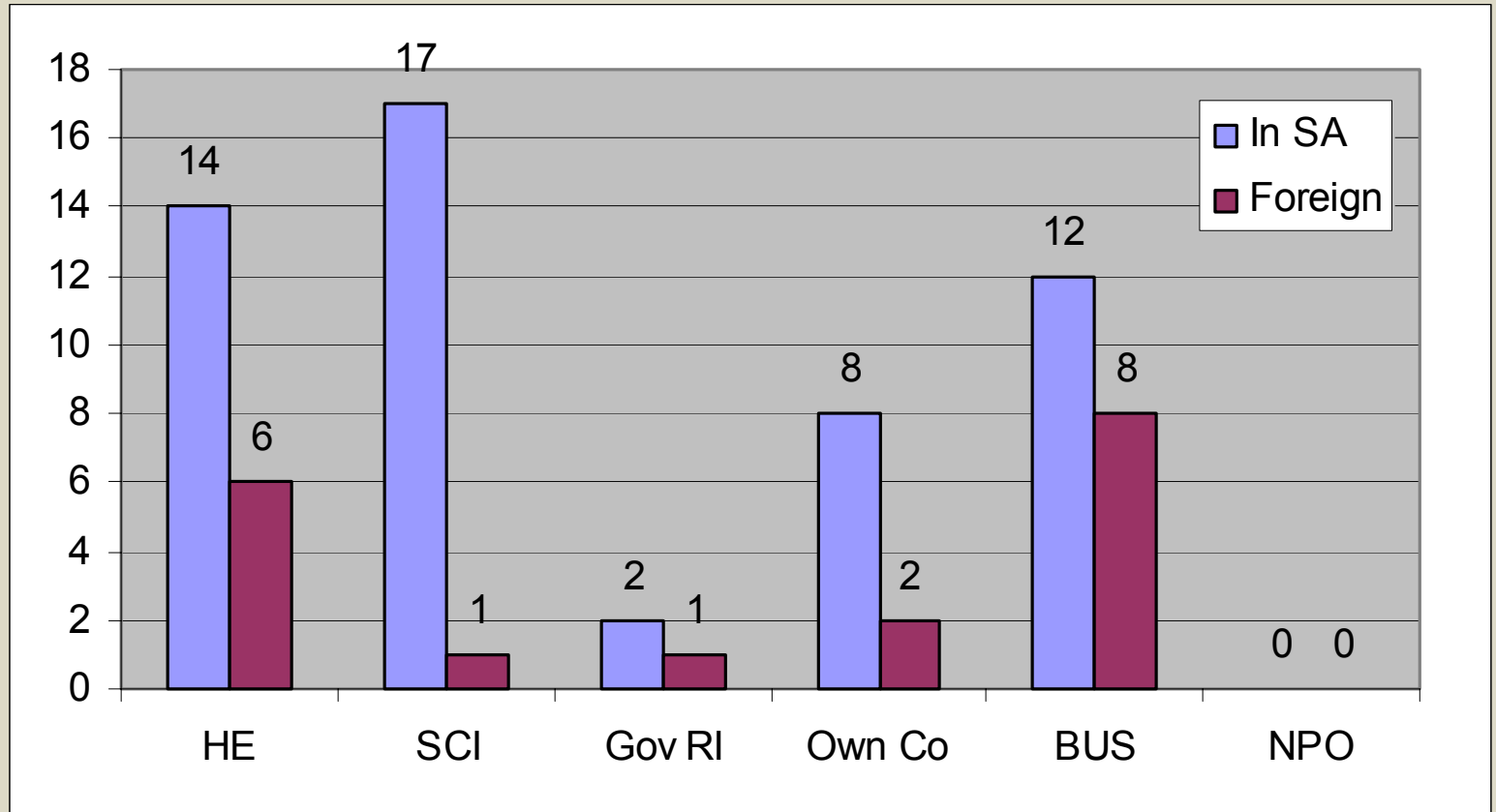
130 SA collaborations, 45 foreign

Pharmaceutical (18 Firms)



37 SA collaborations, 16 foreign

Mining (18 Firms)



53 SA collaborations, 18 foreign

International perspectives

- Mapping direct financial flows of funding for R&D between GOV, BUS & HE is a way to track cross-sectoral linkages

OK – we've done this

- International trends show that BUS funds a small but growing share of R&D performed in HE & GOV

In SA the BUS-HE flow is very high; to GOV is low

- An increasing share of government-funded R&D is performed by the BUS

Moving in this direction

BUS and HE: UK findings

- 2005 UK innovation survey reported :
 - Information for innovation was obtained from both private & public sources
 - Most frequent partners for collaboration were suppliers, clients/customers
 - 1/3 among the collaborators included universities

What does this all suggest?

- According to the 2001 Innovation Survey
 - Innovative firms cooperated more with foreign partners than domestic partners
 - The relationship between innovating firms and the HE sector was relatively weak
- But the R&D Survey (work in progress) shows
 - R&D performers collaborate more with local than foreign sources – plenty of interaction is occurring across the NSI
 - The preferred local partner for collaboration is Higher Education
 - Preferred foreign partner is foreign companies
 - Mining, Manufacturing and ICT show a 3:1 preference for SA collaborators

Local is lekker

Regarding policy and management ...

- Work in progress – clusters; local vs foreign firms
- Carefully examine the findings of the 2005 Innovation Survey w.r.t. 2004 R&D Survey and collaboration
- Improve future data collection
- Promote collaboration through
 - Grant conditions
 - Flexible contracts
 - Regulations promoting I P sharing
 - Recognition of the long R&D value chain

Be upbeat about the value of collaboration

CeST II

We thank You

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