Contrasting industry and government attitudes to innovation support

Manufacturing Thursday Presentation
26th November 2009

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IfM Centre for Industry and Government

Overview

- Introduction and overview of CIG
- Examples of recent and ongoing projects
- Presentation on innovation policy attitudes project
- Discussion

Centre for Industry and Government

- The Centre for Industry and Government aims to provide novel research to underpin developments in industrial and innovation policy in order to support ongoing efforts to improve economic growth.

Centre for Industry and Government

Understand the changing nature of industry, especially the economics of new industries and their impact on national economies

Understand the changing nature of the relationship between government and industry

How government policy impacts existing and emerging industries

Explore the re-emergence of industrial policy and its theoretical foundations

Assist government in developing innovation and industrial policy in support of sustainable growth

EXAMPLES OF RECENT AND ONGOING PROJECTS

Example project – Design Scoreboard

R&D ≠ Innovation ≠ Design

National ranking of design capabilities:
based on absolute indicators

1 U.S.
2 Korea
3 Japan
4 U.K.
5 Canada
6 Singapore
7 Sweden
8 Hong Kong
9 Norway
10 Denmark
11 Finland
12 Iceland

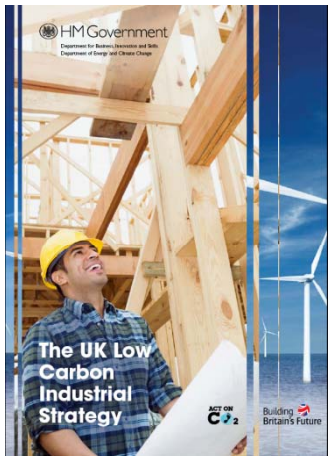
National ranking of design capabilities: based on relative indicators

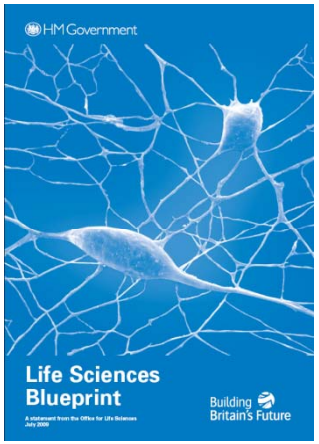
1 Singapore
2 Korea
3 Iceland
4 Sweden
5 Canada
6 U.K.
7 Denmark
8 Norway
9 Finland
10 Japan
11 U.S.
12 Hong Kong

Example project – Design Scoreboard

Example project –
Re-emergence of industrial policy

- UK taking an 'activist' stance towards industrial structure
  - "... [change] demands a new and more active approach from government ... there is a case for targeting certain kinds of public policy measures ... on the basis of robust criteria ..." **BERR (2009) New Industry, New Jobs**

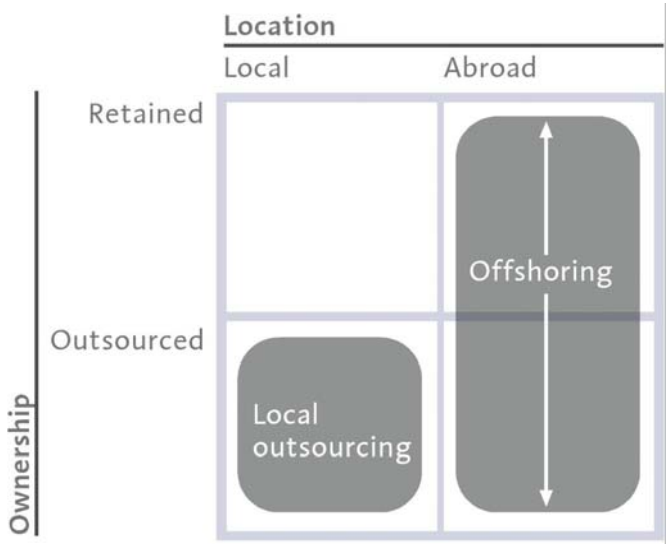


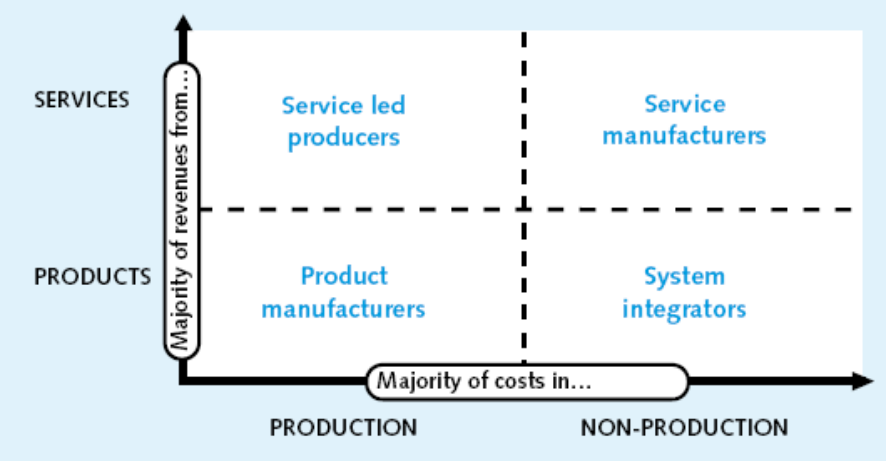


- Foundations for industrial policy unclear
  - The existing rationales based on market failure and system failure struggle to explain or guide the policy maker

Example project -
High Value Production

- Follow on work from *High Value Manufacturing report*
- Aims
  - *To capture the structure and characteristics of high-value production to inform industrial strategies and government policies*





Example project -
High Value Production

- Few attempts to quantify production impact on company outcomes to date
- This work will develop a characterisation of production that can be assessed over time and sectors in relation to outcomes (revenue, profit)
- Aim is to create an evidence base on which discussions on the importance or otherwise of production can be based
- Currently piloting a survey
  - Please take one and complete if of interest to you!

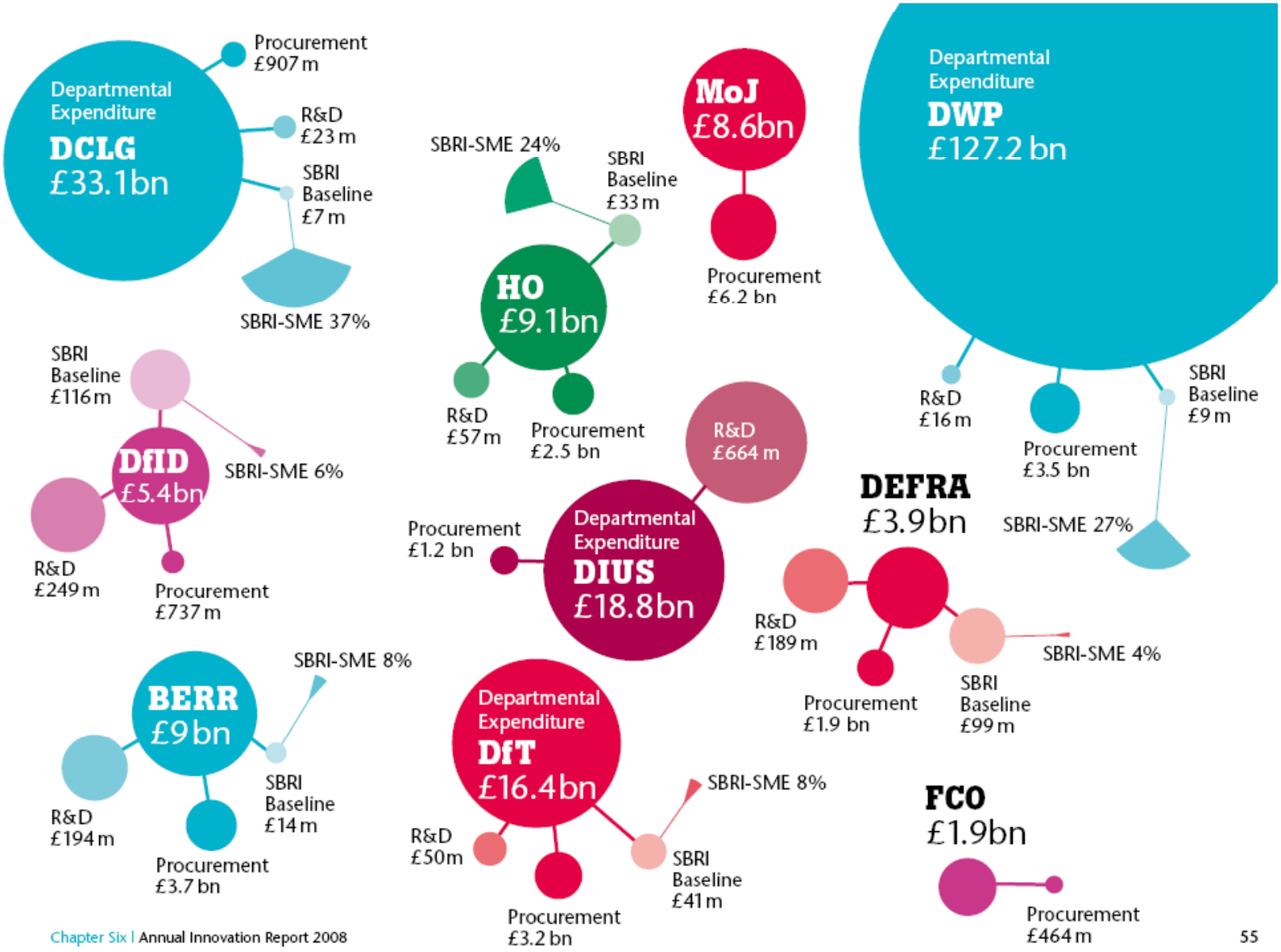
Interim project discussion

CONTRASTING INDUSTRY AND GOVERNMENT ATTITUDES TO INNOVATION SUPPORT

Background

- Innovation is seen as key to growth
  - "Harnessing innovation in Britain is key to improving the country's future wealth creation prospects." (HM Treasury, 2004)
  - "We're determined to ... harness innovation as the driver for a new era of long-term prosperity." (DIUS, 2008)

Scale of government 'innovation' investment?



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DIUS (2008) Annual Innovation Report

Background

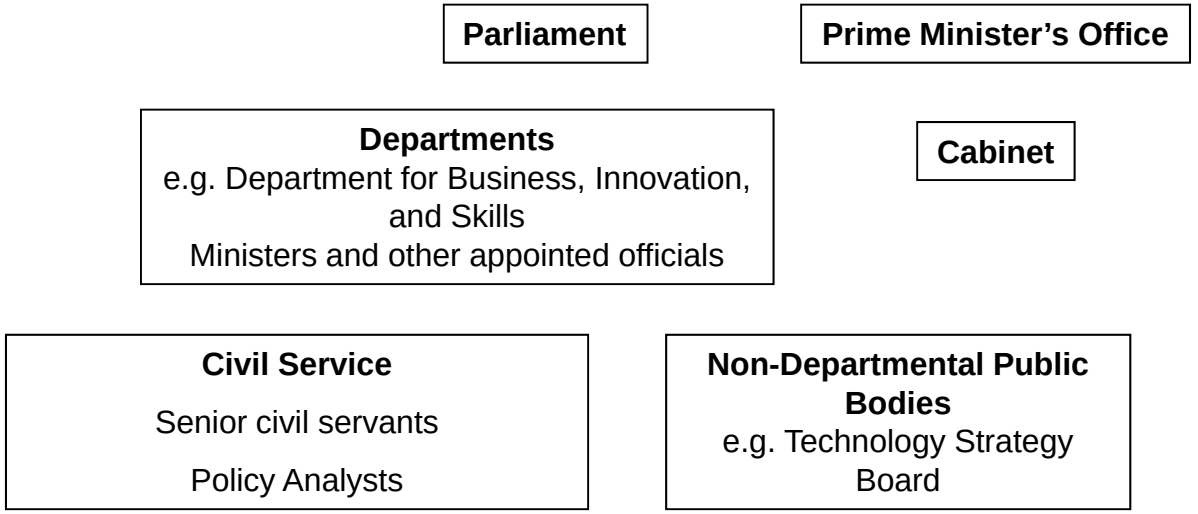
- Innovation is seen as key to growth
  - "Harnessing innovation in Britain is key to improving the country's future wealth creation prospects." (HM Treasury, 2004)
  - "We're determined to ... harness innovation as the driver for a new era of long-term prosperity." (DIUS, 2008)
- There appears to be little work contrasting the attitudes of industrialists and legislators in this area at a detailed level in a repeatable and comparable manner.
  - "While the significance of innovation is recognised, the attitudes of the public and the private sector on how innovation should be supported are not well understood." (DIUS, 2008)

Aims of the project

- Develop a method to assess differences in attitudes to innovation support across industry and government at different points in the innovation process
- Collect data for 3+ sectors and in 2 government departments
- Show the levels of agreement/disagreement
  - Sector to sector
  - For large versus small companies
  - Between government and each industrial sector
- Provide input to industry and government to strengthen the dialogue on innovation support in the UK

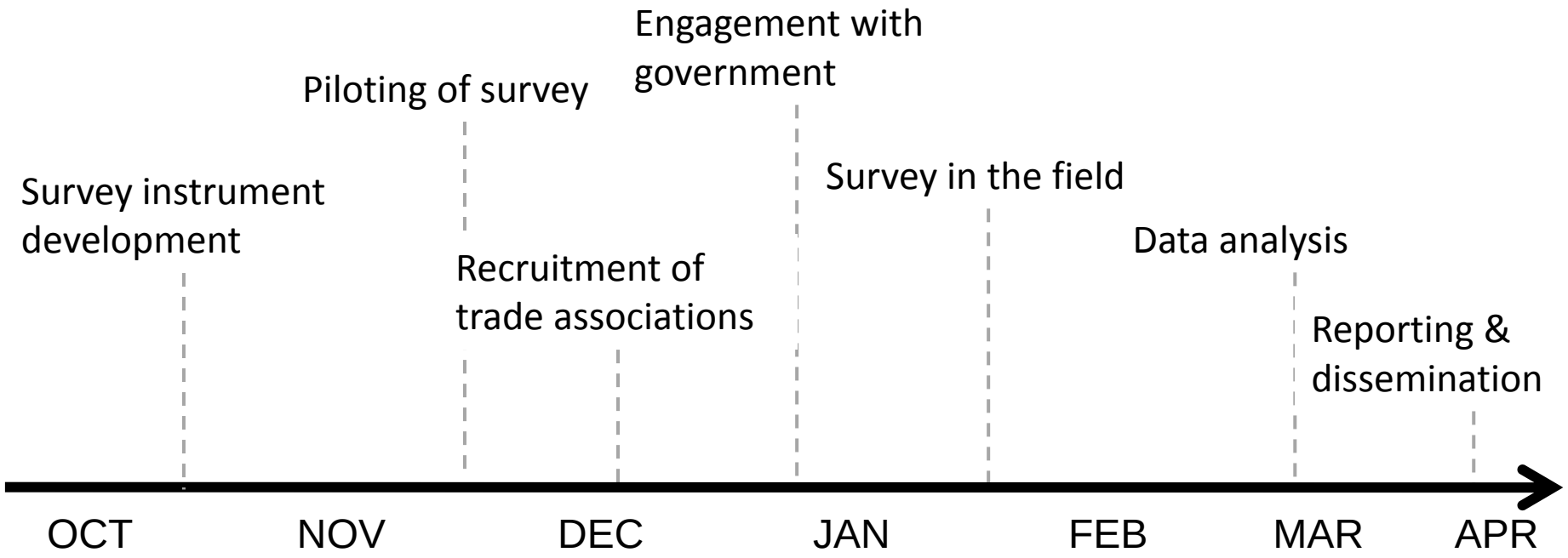
Issue - Who is the 'government'?

- There is a significant difference between the 'Government' and the 'government'



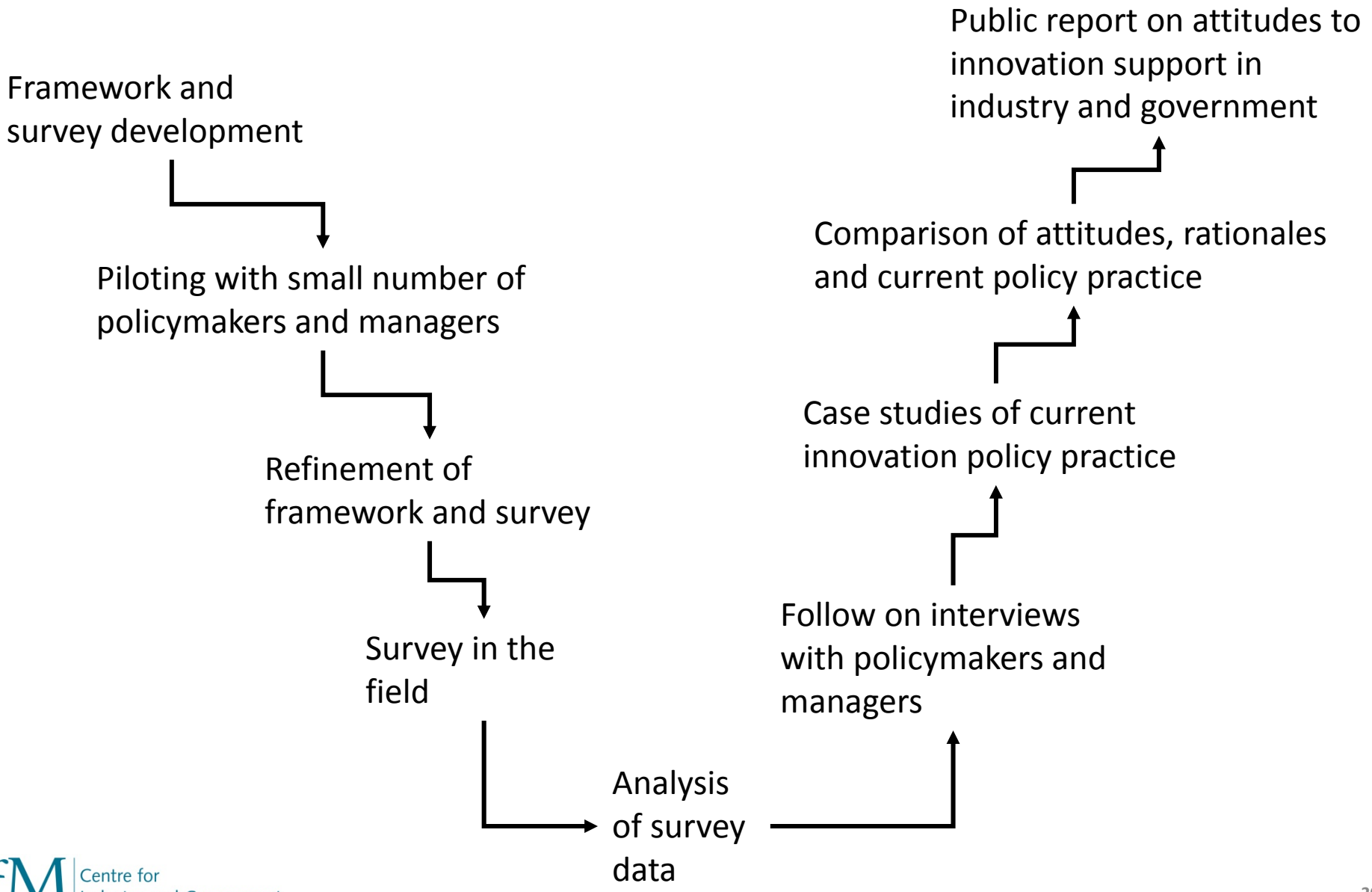
- "… the elected government is democratically accountable for the administration of the state, it is the higher civil service … which translates the political agenda of government into workable practices." Barnett (2002, p.97)

Timeline



- Expected outputs to include journal papers and a public report on differences in attitudes to innovation support
- Hope if successful in UK to extend the approach to other countries and have country comparisons as well

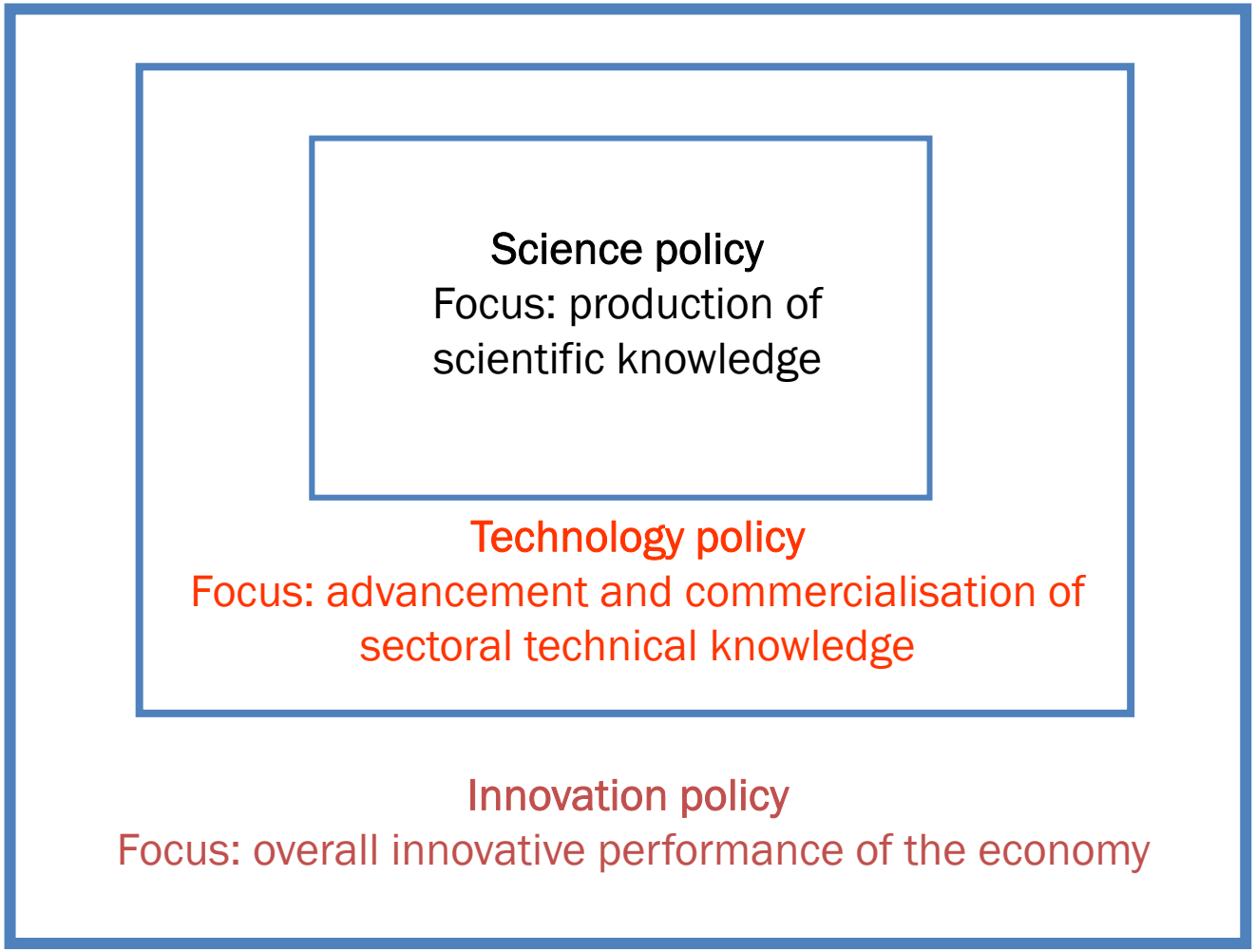
Approach


Framework and survey development
Piloting with small number of policymakers and managers
Refinement of framework and survey
Survey in the field
Analysis of survey data
Follow on interviews with policymakers and managers
Case studies of current innovation policy practice
Comparison of attitudes, rationales and current policy practice
Public report on attitudes to innovation support in industry and government

Existing work on attitudes to innovation support

- There is little existing literature on how industry or government perceives innovation support at a detailed level
- Massa and Testa (2008) survey of 180 SMEs in Italy, collected data from entrepreneurs, policymakers and academics on their perspectives on innovation
  - Strong differences on how each defined innovation
  - Strong differences on types of support
- Government attitudes appear to be dominated by supporting research
  - “For years the dominant paradigm was that innovation flowed from scientific progress. Indeed many policy documents still seem to cling to this notion.” (D'Este and Neely, 2008, p.19)

Issue – boundaries of policy areas



Lundvall and Borras (2005)

Macro level categorisations of policy

- According to Hart (2002) there are four key actions which the government can take that are relevant to this discussion of innovation -
  - to tax citizens or corporations (and therefore setting incentives),
  - be a market participant (i.e. spending public money on the goods it needs),
  - set the rules (e.g. intellectually property law or competition policy); and
  - to set a vision (in more formal language act as the bearer of normative order)

Macro level categorisations of policy

- Home Office guide to policy (Ledbury et al., 2006) uses five categories to group policies –
  - Information, education and advice (e.g. school league tables, labeling);
  - Direct intervention (e.g. provision of a service or commissioning of a service);
  - Economic instruments (e.g. taxes, tax credits, loans etc.);
  - Regulation and other legislation (e.g. health and safety legislation, price regulation); and
  - Market-based solutions (e.g. voluntary agreements and codes of practice)

No agreed or common categories for innovation policy in the literature

- Below the macro level there does not appear to be a single taxonomy or agreed structure for innovation policies.

Policy tool	Example
1. Public enterprises	Innovation by publicly owned enterprises, setting up of new industries
2. Scientific and technical	Research laboratories, research grants, support for learned societies
3. Education	All types
4. Information	Information networks, libraries, advisory and consultancy services
5. Financial	Grants, loans, subsidies, financial sharing arrangements, provision of equipment, buildings or services, loan guarantees, export credits
6. Taxation	Company, personal, tax allowances ...
7. Legal and regulatory	Patents, regulation, monopoly regulation
8. Political	Planning, regional policies, honours or awards for innovation, encouragement of mergers or joint consortia, public consultation
9. Procurement	Central or local government purchases
10. Public services	Purchases, maintenance, ...
11. Commercial	Trade agreements, tariffs, currency regulations
12. Overseas agent	Defense sales organizations

(Rothwell, 1982)

Area	Policy
Direct funding	1. R&D contracts with private firms 2. R&D contracts and grants with universities 3. Intramural R&D conducted in government laboratories 4. R&D contracts with consortia that include two or more of the actors above.
Indirect support for technology development; Direct or indirect support for commercialisation and production	5. Patent protection 6. R&D tax credits 7. Tax credits or production subsidies 8. Tax credits or rebates for purchasers of new technologies 9. Government procurement 10. Demonstration programmes
Information and learning	11. Education and training 12. Codification and diffusion of technical knowledge 13. Technical standards setting 14. Technology and/or industrial extension services 15. Publicity, persuasion, consumer information

(Alic, 2002)

Compressing available lists of innovation policies

Policy heading/type	Included in
Direct funding	R A SV DB
Tax incentives	R A DB
Regulation/IPR rules	R SV DB
Standards	A SV
Vision/political	R DB
Government procurement	R A SV DB
International representation	R SV DB
Education	R A SV DB
Information	R A SV DB
Science and technical infrastructure	R DB
Public enterprise (innovation by publicly owned enterprises)	R DB

(R – Rothwell, A – Alic, SV – Stoneman and Vickers, DB – Dodgson and Bessant)

Policy list used as basis for pilot survey

Direct grants, 100% funded
Tax credits
Direct grants, part funding
Collaborative grants (i.e. consortium required to apply for funding)
Vision/strategy documents
Target setting
Identification of priorities
Support for the development of networks
Standards development
Metrology support
Use of procurement to fund activity of this nature
Support to internationalise
Setting of prizes for this type of activity (e.g. X-Prize)
Training and skills development
Price controls
Subsidies for the activity
Public venture capital

Describing innovation at the firm level

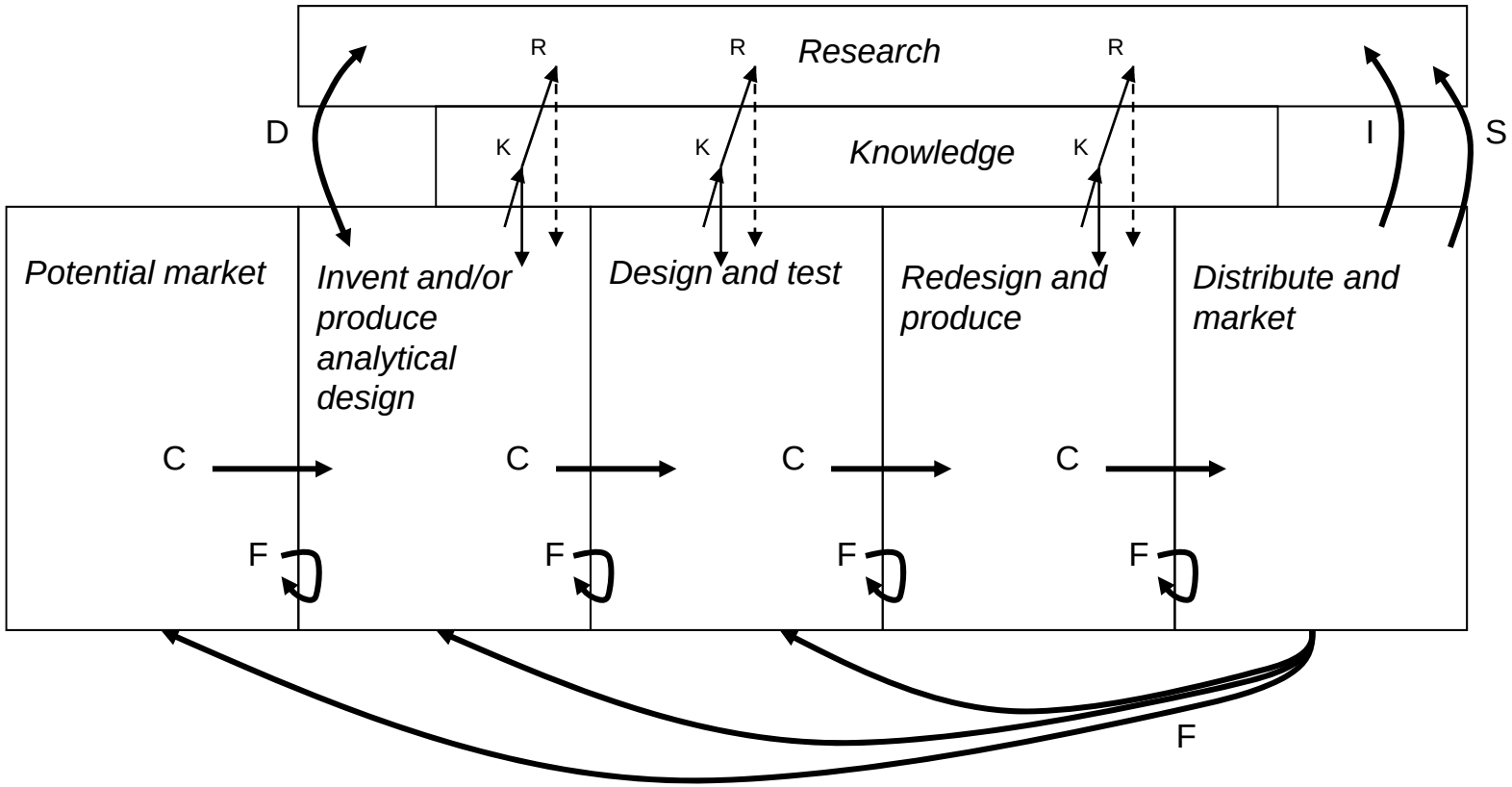
- "For something that is widely considered to be of crucial, even strategic, importance, it is remarkable that there is so little agreement as to what is meant by technological innovation." Jamison (1989, p.505)
- Innovation in its broadest sense is the bringing to market of new products and services (DTI, 2003)
- But this level of description does not allow for the development of policy

Linear model

RESEARCH → APPLIED RESEARCH → DEVELOPMENT → PRODUCTION → MARKET

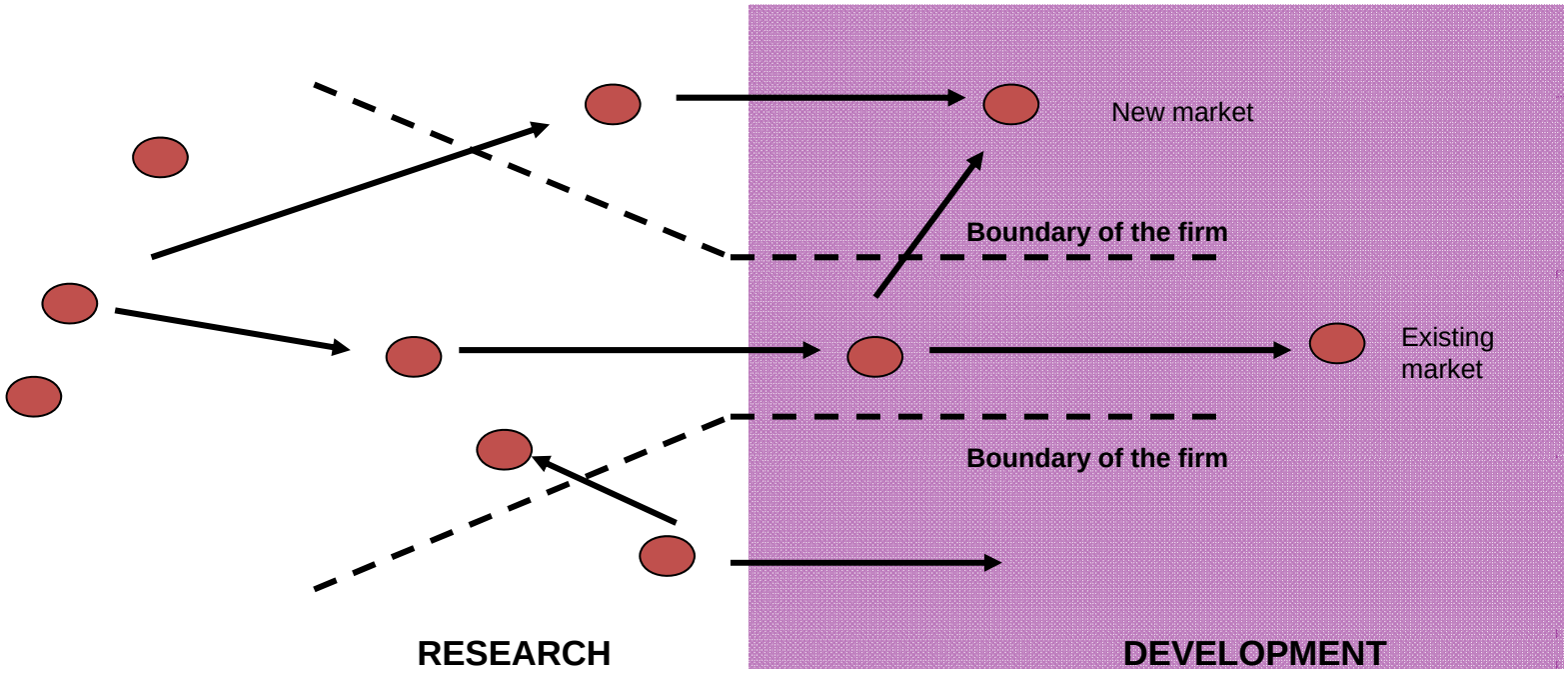
- Most often attributed to Vannevar Bush in *Science the Endless Frontier*, 1945
- Some claim that it dates back to Francis Bacon in his *Novum Organum*, 1620
- Very much a push model, lacking in feedback
- No place for users in this model

Chain linked model



- From Kline and Rosenberg, 1986
- No dominant path for innovation
- Significantly plays down the research base as a source of innovation

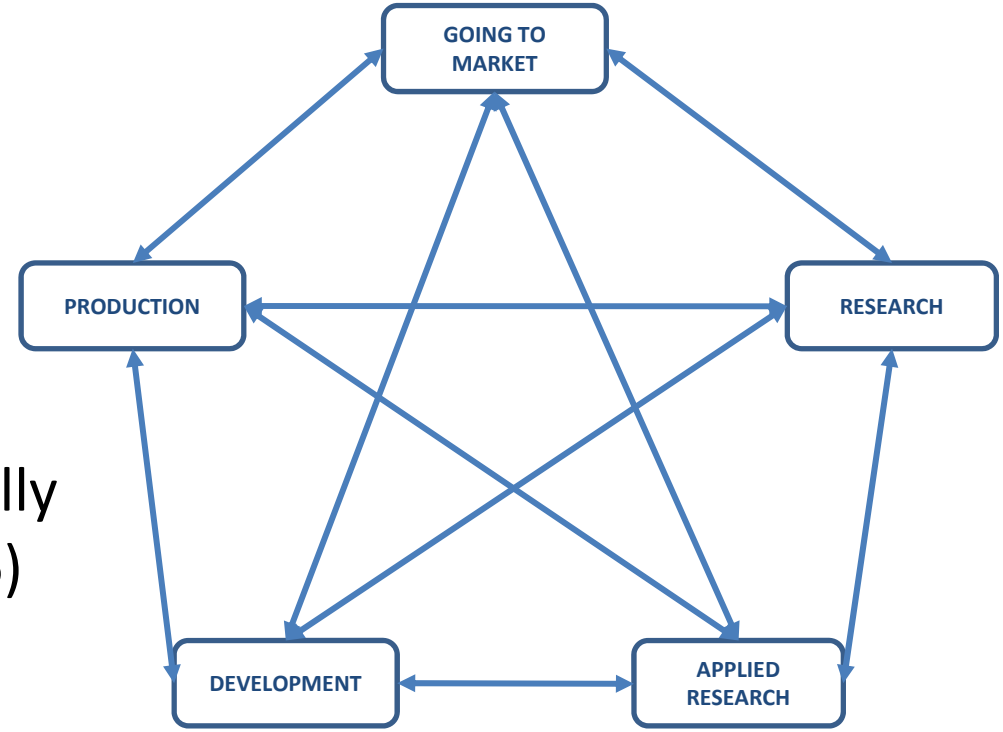
Open innovation



- Acknowledges the multiplicity of actors in bringing an innovation to market
- Companies can commercialise their ideas or those of others
- Ghosts of the linear model in the characterisation of the movement from research to development

Where does this leave us?

- "Some serious question marks hang over all the available models" (OECD, 2005, p.24)
- It could be argued that all current models are essentially linear (Berkhout et al., 2006)
- Which most appropriate for this task?
  - Modified linear (i.e. Keep simplicity of activities but acknowledge linkages and non-linearity)



	RESEARCH	APPLIED RESEARCH	DEVELOPMENT	PRODUCTION	GOING TO MARKET
Direct grants, 100% funded					
Tax credits					
Direct grants, part funding					
Collaborative grants (i.e. consortium required to apply for funding)					
Vision/strategy documents					
Target setting					
Identification of priorities					
Support for the development of networks					
Standards development					
Metrology support					
Use of procurement to fund activity of this nature					
Support to internationalise					
Setting of prizes for this type of activity (e.g. X-Prize)					
Training and skills development					
Price controls					
Subsidies for the activity					
Public venture capital					

Example question extract from pilot survey

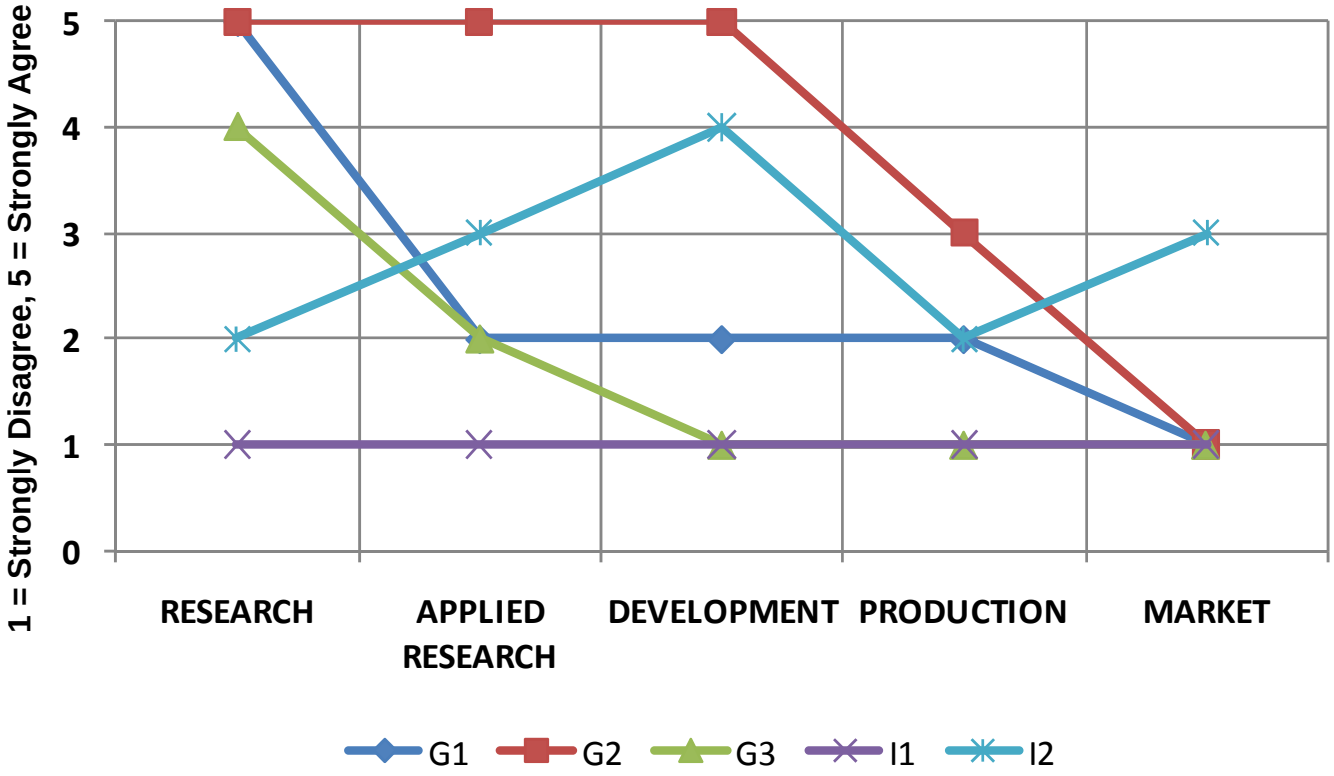
Q.2 Please score each of the following policy instruments on a scale of 1 to 5, based on whether you agree or disagree that it is important for government to use that instrument at the **Research** stage, where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree.

	1	**2**	**3**	**4**	**5**
Direct grants, 100% funded					
Tax credits					
Direct grants, part funding					
Collaborative grants (i.e. consortium required to apply for funding)					

Piloting the survey

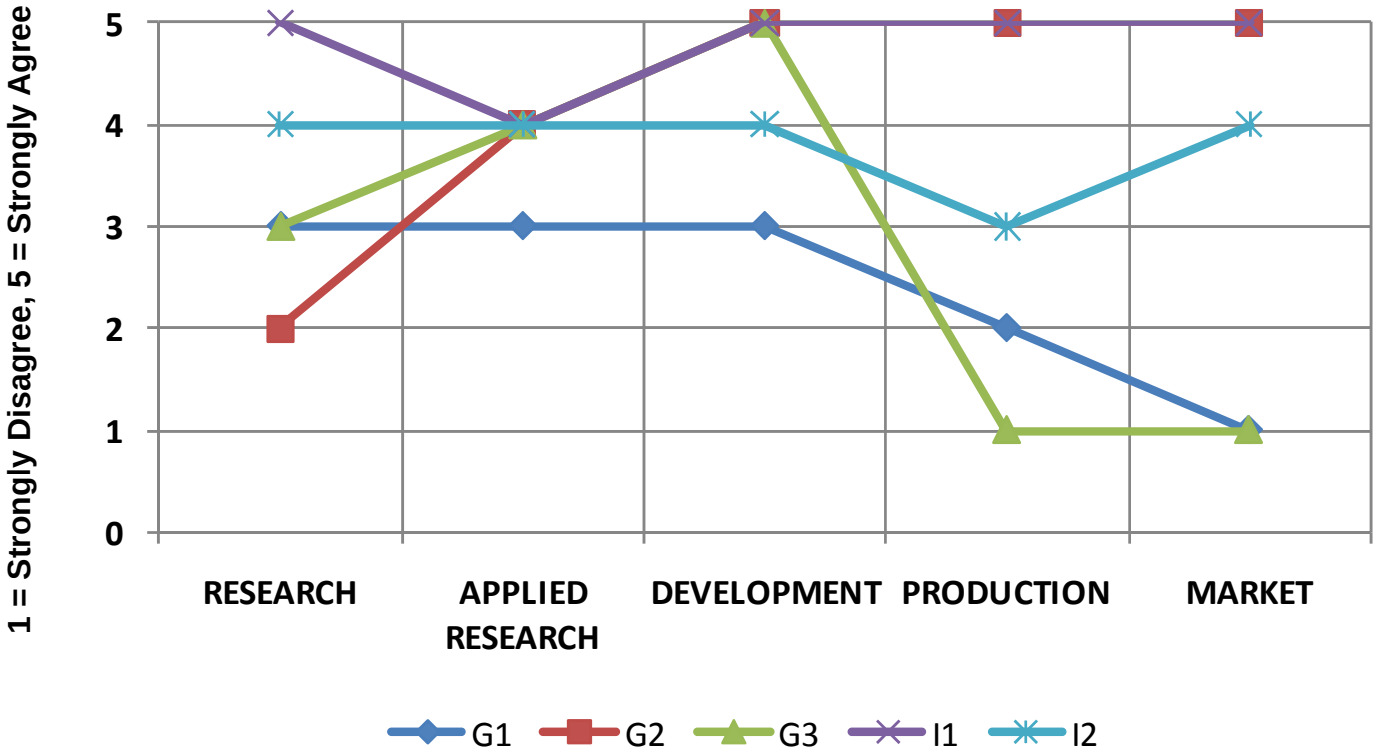
- Aim to have 10 government and 10 company pilots
  - Government pilots with mid to high level civil servants in BIS, HMT and TSB
  - Industry pilots with senior managers in both large and medium size companies
- To date 5 government and 5 industry pilots complete
  - Questionnaire completed
  - Follow up interview of 20 – 30 minutes to discuss
- Key messages so far
  - Survey of great interest
  - Easy to complete (usually 20 – 30 minutes)
  - Some confusion on policy titles and the repetitive nature of the policy list

Example individual data – 100% funded grants



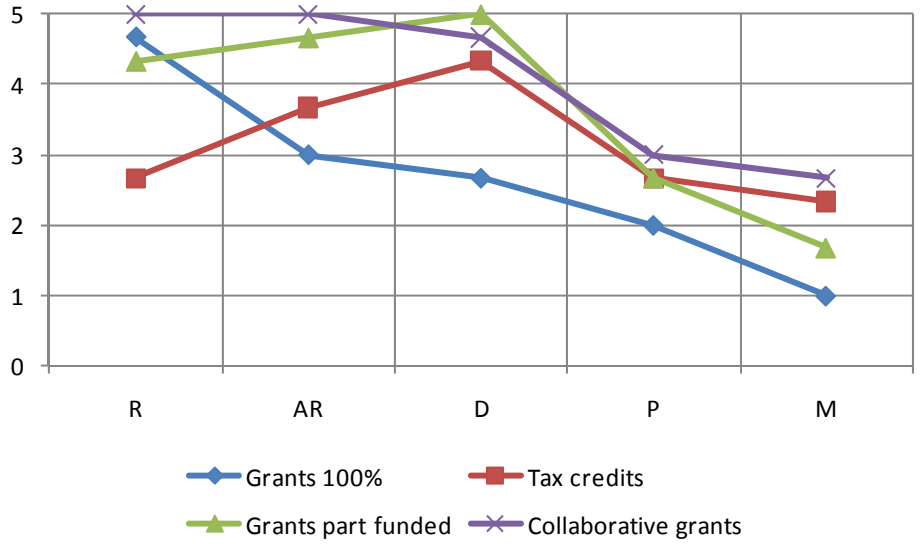
Grants 100%					
	G1	G2	G3	I1	I2
RESEARCH	5	5	4	1	2
APPLIED RESEARCH	2	5	2	1	3
DEVELOPMENT	2	5	1	1	4
PRODUCTION	2	3	1	1	2
MARKET	1	1	1	1	3

Example individual data – tax credits

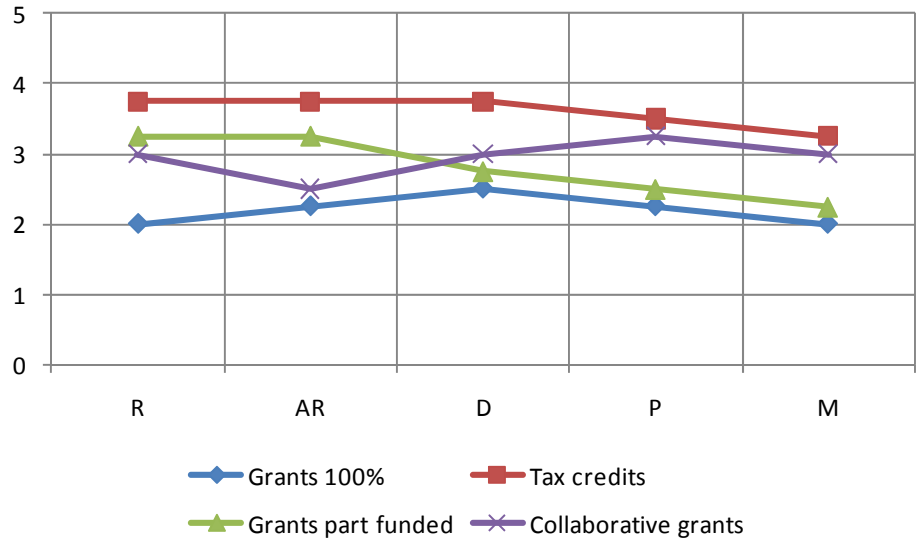


Tax credits					
	G1	G2	G3	I1	I2
RESEARCH	3	2	3	5	4
APPLIED RESEARCH	3	4	4	4	4
DEVELOPMENT	3	5	5	5	4
PRODUCTION	2	5	1	5	3
MARKET	1	5	1	5	4

Pilot data comparison for funding mechanisms

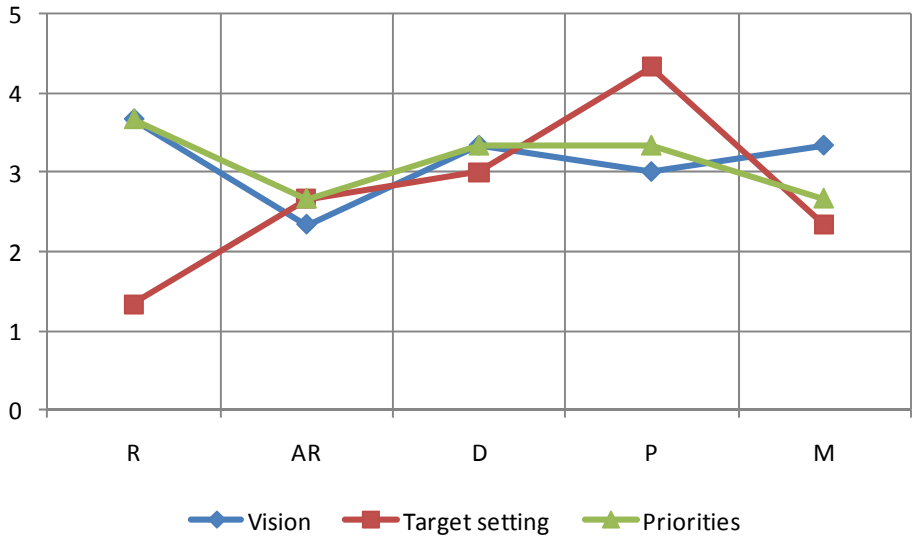


Average government response

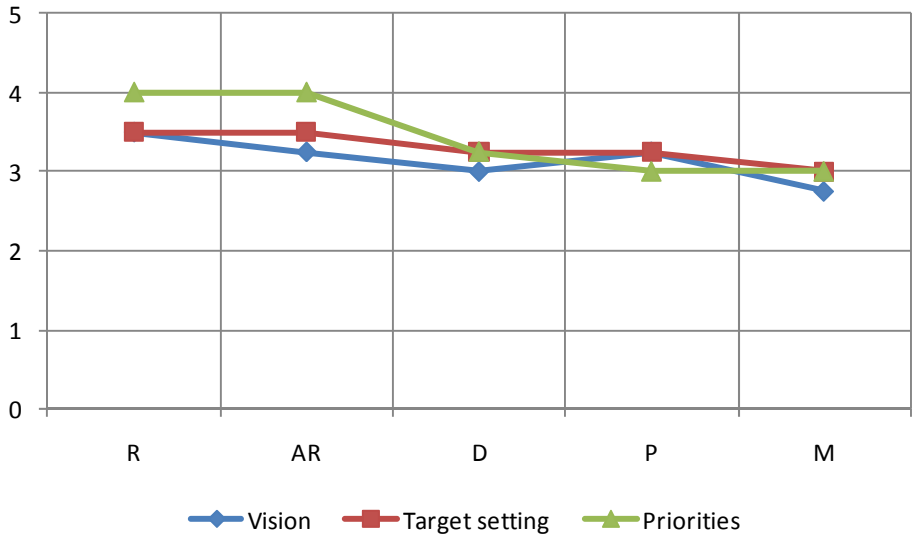


Average industry response

Pilot data comparison for targets and vision



Average government response



Average industry response

Survey in preparation

- Survey prepared for completion and collection online
- Discussing distribution and promotion of the survey via a number of organisations including
  - trade associations
  - business support agencies
  - existing industrial network of the IfM
- Target 200+ industrial responses over 3 – 4 sectors

Ongoing issues for the project

- Analysis of Likert based data
  - Limits to what can be done
  - Policy list not a summated scale
  - Will cluster analysis work here?
- Response rates and statistical significance
- What to do with data that has no structure?
- Who is ‘government’ in this work
  - Cabinet, MPs, senior civil servants, analysts, ...
- Voice of the company?
  - Especially for large companies

- Are we equating R&D spending with innovation?
- Should R and D be separated in statistics and analysis?
- How common can innovation approaches be for different sectors?
- Is innovation a coherent concept in policy?
- How should we think about the relationships between science, technology, innovation and industrial policy?
- Can their be a coherent set of policy instruments for innovation support?

MANY QUESTIONS REMAIN ...

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