

Innovation and Finance in the UK Innovation and Research Strategy

Keith Smith

Imperial College, London

and

Knowledge and Innovation Analysis Division

Department of Business, Innovation and Skills,

London

Government economic objectives:

- Reduce Deficit/GDP ratio and Debt/GDP ratio
Instrument: public expenditure reductions
- 'Rebalance' economy away from financial services
Instrument: enhanced investment via low interest rates
- Return to growth on sustainable basis
Instrument: Green technology/carbon pricing

UK economic advantages

- The sixth-largest manufacturing sector in the world. Strong positions in aerospace (aircraft, satellites), pharmaceuticals, high-performance automotive, scientific instruments etc.
- Strong financial sector outside investment banking: insurance, broking, trade finance
- Strong media and communications – films, music, TV, computer games etc
- Cultural and tourism related services

What do we know about innovation and growth? (1)

- Growth is innovation-driven: CDM model
- Conceptual framework: Innovation is *systemic* – the innovation system shapes performance
- Innovation is pervasive and multi-sectoral, cumulative, often clustered, investment-based, multi-modal, interactive
 - Less than 50% of innovating firms do R&D
 - Highly innovating firms across all sectors; of top 10%, ca. 25% do not do R&D

What do we know about innovation and growth? (2)

- Knowledge Infrastructures are central to the innovation system. Two basic forms:
- *Science infrastructures* (universities, research institutes)
- *Information infrastructures* (national measurement office, weather, mapping, geological survey, IPO, Design Council, standards office, accediation service etc)

The UK innovation system (1)

- Major science system
 - leading position in world in publications, citations, high-impact publications, scientific productivity, Nobel prizes etc.
 - 150 universities, strong presence in world top ten and top 200; strong base of internationalised researchers
 - large science facilities and infrastructure
 - Approximately 150 Public Sector Research Establishments (one with 11 Nobel prizes...)
- Strong information infrastructure

The UK Innovation system (2)

- Small diverse group of technology-intensive companies; strong services, but relatively weak Low and Medium Tech manufacturing
- Potentially strong financial sector; strong VC market; active market for corporate control
- Well-functioning tertiary education sector
- Large public sector with integrated functions in health, education, defence

Policy priorities

- **Strengthening the sharing and dissemination of knowledge** (Issue: collaboration/competition)
- **Supporting a coherent and integrated knowledge infrastructure** (Issue: science base/Information infrastructure/Catapult centres)
- **Encouraging business investment in all forms of innovation** (R&D tax credits, corporate governance issues)
- **Improving the innovative capacity of the public sector** (procurement/services/technology selection)

Major proposals (1)

- Catapult centres
 - Advanced manufacturing, cell therapies, connected digital, offshore renewables, satellite applications
- Emerging technologies
 - Life sciences and synthetic biology(Crick centre), Graphene hub, energy harvesting (sensors, instruments), energy-efficient computing

Major proposals (2)

- Support Companies' Investments and Collaborations
 - Knowledge Transfer Partnerships, Laucnpad programme, IP Audits
- Support 'Economically Important Sectors'
 - Utilities, Agri-food (digital, food security programme etc)
- Support major research campuses
 - Harwell, Daresbury, Babraham etc

Major proposals (3)

- Global collaboration
 - High value opportunities programme, EU programmes – Horizon 2020 and CIP.
- Government as lead customer
 - SBRI programme; NHS procurement; Procurement ‘centres of expertise’
- Open public datasets
 - transport, weather and health
- Innovation Inducement prizes

Finance: approach and trends

- Innovation Finance
 - venture capital funds, R&D tax credits, SME support, Technology Strategy Board
- Use of companies' retained earnings – this is major source of investment finance including innovation
- Issue: under what circumstances can managers use retained earnings to invest?
- These shaped by corporate governance system

Some big challenges: what do we do about -

- Coordination and identification of opportunities in the system
- The 'information infrastructure' (Measurement office etc)
- Corporate governance and investment
- Catapult centres (advanced manufacturing, cell therapies, satellites, offshore renewables, connected digital) – integration with PROs, coordination
- Technology selection decisions

Trends ...

- Tension between neo-liberal macroeconomic policy, and the innovation system
- More interventionist policy stances emerging
- Institutions such as corporate governance coming into focus
- Coordination as an increasingly important issue
- Need for a new conceptual framework that recognises the realities of innovation