

Hi-tech start-ups and innovation myths

The House of Commons Inquiry on ‘Bridging the Valley of Death: Improving the Commercialisation of Research’ is exploring the difficulty of translating research into commercial application. David Connell, who has given evidence to the inquiry, provided research on how a ‘soft’ business model can encourage innovation.

Commercialising research is vital in generating new jobs and driving innovation. Although university research is often seen as key to hi-tech innovation, solving problems by developing new technologies and products in a business environment constitutes a more important innovation driver. Many of the most successful hi-tech companies in the Cambridge cluster have made use of a ‘soft’ business model, using R&D contracts for individual clients to develop their technology or product during the start-up and early stages of growth. There is significant scope for strengthening innovation policies to support this business model.

The role of innovation and commercial exploitation of the UK science base has assumed increasing importance in national policy, particularly at a time when economic growth is one of the key challenges. A prominent example of hi-tech innovation from research is the Cambridge cluster, the foremost science and technology cluster in the UK.

Many Cambridge cluster companies have preferred a business model based on carrying out R&D contracts for customers – the so-called ‘soft’ model – rather than developing standard products – the ‘hard’ model. The soft model enables both start-up and clients to explore new techniques and solutions in a low-risk environment. ‘Soft’ companies can tailor their offer to meet a wide range of customer needs in different industries, based on their expertise. This model provides much greater flexibility and a wider choice of early customers compared to the strategy of ‘hard’ companies with a narrow range of standard products.

The cash flow ‘valley’ for a soft company is far shallower than for a hard company because fewer start-up costs are involved and customer revenues can be generated quickly. On the

other hand, the growth rate once profitable is much slower than for a hard company - making the soft model generally unattractive for venture capital investment.

A Centre for Business Research report by David Connell and Jocelyn Probert, part-funded by the ESRC-supported UK Innovation Research Centre, has examined the impact of the ‘soft company’ model on the East of England region. Data were collected through 52 interviews with founders or senior managers of major firms operating some form of soft business model and with business intermediaries, as well as a small survey of government R&D grant winners in the East of England region.

Key findings

- Many of the largest and most successful science and technology businesses in the East of England region owe their origins to the ‘soft’ business model
- Firms use the soft model in different ways, depending on their phase of business development and on how innovation works in their industry
- Similarly, financing and intellectual property are managed in different ways, tailored to suit the company’s needs
- Paid development contracts for lead customers help firms focus on real customer requirements and provide endorsement for subsequent customers and investors. In this respect contracts are much more valuable than grants.
- Soft companies’ use of, and attitude to, government policies to support innovation varies widely from scheme to scheme. Responses show:
 - A generally positive view of single company R&D grants
 - An unenthusiastic attitude to the value of collaborative research programmes
 - Little experience of government R&D procurement contracts

- An informal approach to interaction with universities, with university IP playing only a limited role as a basis for innovation.
- Three largely erroneous 'innovation myths' have underpinned government policy thinking for decades:
 - **Myth:** University research is the economy's key source of technology and innovation
Finding: Solving problems for lead customers in a business environment is the real driver of innovation
 - **Myth:** Venture capital funding is the primary financial resource for technology-based start-ups
Finding: Customer funding through R&D contracts or purchase of prototypes is often the key source of early stage funding; venture capital tends to come in later or not at all
 - **Myth:** Co-funding multi-partner collaborative research programmes is the best way for government to support technology development projects
Finding: Most successful soft companies have made little or no use of collaborative R&D grants. Instead, tightly specified, single customer-contractor relationships with clear phases and milestones are crucial in driving innovation through to real products.

Policy relevance and implications

- R&D contracts from customers play a key part in the development of new businesses and job creation. However, government procurement remains virtually absent as a lead customer for trials of new technology through either R&D contracts or prototype purchases. This contrasts with the US where procurement based policies dominate government R&D funding for SMEs; the Small Business Innovation Research Programme (SBIR) is the lead programme for SMEs.
- The UK Small Business Research Initiative, which is modelled on the US SBIR, could be significantly expanded and extended to all major government spending departments and public sector agencies.
- The Technology Strategy Board (TSB) rules for collaborative R&D grants could be reviewed to encourage more bilateral contracts between private sector lead customers and suppliers (especially small, specialist technology companies). The authors suggest that bilateral projects with lead customers should account for

50 per cent of TSB collaborative R&D grant expenditure.

- New investment models enabling a different engagement with soft start-ups than in conventional venture capital funds should be encouraged – probably involving smaller scale investments, a longer time horizon and a more 'hands-off' approach.
- Universities are ill-equipped to undertake the "exploratory development" of applications needed to turn new technologies into venture capital backable business propositions. 'Intermediate research laboratories' – partly funded by government and partly through R&D contracts for customers, with staff motivated to work flexibly across different projects – could help to catalyse exploitation of the science base.

Uptake of policy recommendations

- Since publication the results of the research have been widely disseminated through workshops and private meetings with officials and politicians at UK and EU level.
- Both the Government and the Opposition have given strong support for expansion of the UK SBRI above its current level of around £20m per annum.
- At EU level, the results have been discussed at meetings with the Research and Innovation Commissioner Maire Geoghegan-Quinn and Vice President Tajani and presented to a meeting of the European Competitiveness Council in Budapest. The Commission has proposed that around 9 per cent of the Horizon 2020 budget should be devoted to a new 'SME Instrument' based on the US SBIR model.
- The TSB's new Catapult Centres are examples of the kind of Intermediate Research Centres advocated in the report.



BRIEF DESCRIPTION OF THE RESEARCH

An analysis of the economic impact from 'soft model' companies, part-funded by the ESRC-supported UK Innovation Research Centre, indicates that many of the most successful Cambridge high technology companies have their origins in the 'soft' model, based on using customer funding as a more flexible approach to product development, compared to the 'hard' model based on using venture capital to fund the development of standardised products. The report identifies three long-standing 'innovation myths' which have underpinned policy thinking and makes a series of policy recommendations.

David Connell and Jocelyn Probert: *Exploding the Myths of UK Innovation Policy: How 'Soft Companies' and R&D Contracts for Customers Drive the Growth of the Hi-Tech Economy*

(Centre for Business Research)

Web: www.cbr.cam.ac.uk/pdf/MYTHS_Report.pdf (PDF)

FURTHER INFORMATION

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The Economic and Social Research Council is the UK's leading agency for research funding and training in economic and social sciences.

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