

Emulating a US approach to funding



A US-style Small Business Innovation Programme would help the UK economy stay competitive; if government departments are to play their full role in building a modern innovation economy they must learn to place R&D contracts with early-stage science and technology companies says David Connell

When Dr Helen Lee was deciding where to set up her new diagnostics business five years ago, the decision was a no-brainer. As head of the 100-strong diagnostics R&D team at Abbot Laboratories in the US she had faced a similar decision five years previously.

On that occasion she wanted to move out of a business environment to set up an academic group to develop rapid, inexpensive tests for the detection of infectious diseases, particularly in developing countries. She chose the UK's Cambridge as one of the best universities in the world to undertake ground-breaking research in her chosen field and was quickly able to build up a world class team of 12 scientists with funding from the Wellcome Trust, US National Institutes of Health (NIH), and World Health Organisation.

By 2001 she was ready to set up a business to commercialise the technology her team had developed. The idea was to provide low-cost tests to developing countries, but make a

commercial return out of sales into the US, Europe and other more developed economies. The Wellcome Trust provided some of the key initial funding for the business through its Technology Transfer Fund.

But Dr Lee chose to set up her company, Diagnostics for the Real World, not in Cambridge, but in California. One of the primary reasons for this decision was the availability of US federal funding through the US Small Business Innovation Research (SBIR) programme. Since the company was established, it has won £3m (\$5.5m) in SBIR awards from the US NIH, providing almost 100 per cent of the funding for proof-of-concept and development programmes for rapid diagnostic tests aimed at HIV, Hepatitis B and Hepatitis C.

Dr Lee is just one of thousands of US entrepreneurs to have benefited from the US SBIR programme. Established in 1982, it is the world's largest seed capital programme for science and technology businesses, and each year makes more than 4,000 awards to US small busi-

nesses, totalling over a billion pounds.

SBIR awards take the form not of equity, loans or grants (in the sense used in the UK), but of contracts for the development of technologies that US federal government agencies believe they require as customers, specifiers or research organisations. (Some SBIR awards are defined as "grants", but they provide 100 per cent funding for directed research projects so are contracts in all but name). The aim is that awards will lead on to mainstream development contracts, procurement by the agency of developed products or some other form of commercialisation.

There is a highly efficient competitive process for making awards based on the publication of batches of solicitations at regular intervals in the year by participating agencies. The whole process is highly transparent. SBIR awards are designed to provide all the funding needed for a project, plus a small profit element for the business undertaking it. While the "norm" is £450k (\$850k)

for each project, the size of awards can be substantially larger. Small businesses can win and run multiple projects in parallel. It is quite common for US companies to have received several million dollars, sometimes each year, from this source.

The SBIR programme is just part of the panoply of US policies designed to favour small business through the procurement process – both directly and indirectly through the large corporations that mainly supply government agencies. It is the first step on the procurement ladder.

As a result, US early-stage technology companies have access to much more government R&D funding per company – probably by an order of magnitude – than in the UK. As a source of early-stage finance, the SBIR programme is almost as important in value terms as venture capital. However, unlike most venture capital investments, SBIR awards are available from the start of a business's life.

Companies that have benefited include major corpo-

rates such as Qualcomm, Amgen and Genzyme, and many lesser known companies including Photobit and Embrex. Qualcomm, Amgen and Genzyme won SBIR awards in their early days then moved on to grow rapidly through VC financing and IPO. Photobit's success with CMOS image sensors for defence applications led on to it becoming a major supplier to the mobile phone industry and its acquisition by a larger publicly listed US firm. Embrex, which sells chicken vaccination equipment and other poultry related technology, is an example of the many smaller specialised technology firms that have benefited from the SBIR programme.

As important as the cash that SBIR awards provide, is their focus on contracts to develop technology which government agencies believe they will require, and its relationship to the 'natural' processes by which companies evolve.

The popular perception of how successful high-tech companies get started is based on the so-called "Silicon Valley", or "hard company" model. An engineer or scientist has an idea for a new product. He starts development in his laboratory or garage with a couple of colleagues, writes a business plan and uses that to raise money from venture capitalists and other investors. This, and subsequent investments, finances the development and marketing of the company's product.

The reality is usually rather different. In practice it is often R&D contracts placed by customers that play the key role in getting a business started and in early stage funding, not equity from investors. This is sometimes known as the "soft company" model.

Many of the UK's successful technology companies owe their origins to the "soft" company model. An example is Cambridge Silicon Radio (CSR), probably the most successful UK technology start-up of the 1990s.

CSR's founders had honed their CMOS wireless design expertise and management skills over 10 years within

Cambridge Consultants by carrying out a wide range of development contracts for different customers. When Bluetooth emerged as an important new wireless standard, they were perfectly positioned to spin-out with venture capital funding and start a "hard", product business to exploit it. Their combined experience, and that of the substantial start-up team they took with them, helped CSR succeed against competition from dozens of other Bluetooth start-ups around the world.

R&D contracts perform a particularly important role in relation to platform technologies – scientific or engineering breakthroughs with multiple potential applications. New platform technologies represent some of the most significant spin-off opportunities from within the academic science base, though because of the long timescales involved in searching out, proving and developing valuable applications, they are often hard for venture capitalists and private investors to back. Identifying the real ones only becomes clear as a result of carrying out feasibility studies and then developing technical demonstrators or prototypes for different users. A paid R&D contract with a potential customer is the best market research a company can have.

The public sector represents a substantial proportion of the UK economy, purchasing some 55 per cent of information technology products and services, for example. If the UK is going to build the innovation economy it needs to remain competitive as a nation, government departments must play a full role by placing R&D contracts with early-stage science and technology companies.

As a general principle, this is well understood, but government efforts to turn principle into practice have so far failed. In an attempt to emulate the US SBIR programme, a similarly named initiative was started here in 2001. Called the "Small Business Research Initiative" (SBRI), it provided a web portal through

"SECRETS" OF THE WORLD'S LARGEST SEED CAPITAL FUND:

How the United States Government Uses its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to Support Small Technology Firms

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which departments could advertise R&D contracts. However, up to 2005 it only advertised contracts totalling about £2m per year, and virtually no departments participated. Despite attempts to improve it, SBRI still bears little or no resemblance to the US programme.

The cry that "Britain is good at science, but poor at exploiting it" is as relevant today as it was in Harold Wilson's time, 40 years ago. The existence of a "funding gap" for early stage science and technology companies has been highlighted at depressingly regular intervals throughout this period. In the US, this gap is mainly filled by the federal government, through the SBIR programme and other forms of R&D contract, not by venture capital.

Dr Lee says: "We would all have preferred to establish the company in Cambridge, because Cambridge is where the research and development has taken place. But

the funding gap for start-up biotech companies in the UK is such that we did not have a choice".

The US is the world's most successful economy at building science and technology based industries and its use of procurement, through the SBIR programme and other mechanisms, has played a key part in that success. We would do well to learn from its experience.

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