Science and Technology Select Committee enquiry into Technology and Innovation Centres (TICs)

Introduction: The British Private Equity & Venture Capital Association (BVCA) is the industry body and public policy advocate for the private equity and venture capital industry in the UK.

The BVCA Membership comprises over 230 private equity, midmarket and venture capital firms with an accumulated total of approximately £32 billion funds under management; as well as over 220 professional advisory firms, including legal, accounting, regulatory and tax advisers, corporate financiers, due diligence professionals, environmental advisers, transaction services providers, and placement agents. Additional members include international investors and funds-of-funds, secondary purchasers, university teams and academics and fellow national private equity and venture capital associations globally.

As a result of the BVCA's activity and reputation-building efforts, private equity and venture capital today have a public face. Venture capital is behind some of the most cutting-edge innovations coming out of the UK that many of us take for granted: the medical diagnostic services we use in hospitals, the chips in our mobile phones, the manufactured components of our cars, and the bioethanol fuels that may run them in the future. Likewise, private equity is behind a range of recognisable High Street brands, such as Boots, Phones4U, Birds Eye, National Grid and Travelodge.

The UK market:

1. The UK has a strong track record when it comes to scientific research and investment in innovation. Indeed as the Hauser Review notes, we are currently 2nd in the G8 only to the US for excellence in research[1] and we have three universities (Cambridge, Imperial and Oxford) that regularly appear in the world's top ten[2]. The UK is regularly ranked near the top for innovation in the EU (though the latest report presents our current position as one of stagnation[3]). However the BVCA's own analysis suggests that despite this strong base in research and innovation, the market for commercial investment in high growth companies is not as burgeoning as it could be.

2. In the UK, the state of the capital markets is usually found at fault when it comes to early stage venture. A BVCA/NESTA report (2009) found that this was both a demand and a supply problem. They dubbed this 'thin markets' where limited numbers of investors and entrepreneurial growth firms within the economy cannot get together at low cost. This analysis is less applicable to say the US which is characterised by deep markets[4].

[1] International Comparative Performance of the UK research base, September 2009 (http://www.dius.gov.uk/assets/biscore/corporate/migratedd/publications/i/icpruk09v1_4.pdf

[2] Times Higher Education Supplement rankings, see http://www.timeshighereducation.co.uk/world-university-rankings/2010-2011/top-200.html

[3] European Innovation Scoreboard 2009

[4] From Funding Gaps to Thin Markets: UK Government Support for Early Stage Venture Capital, BVCA, 2009

In comparisons with other countries, investment in early stage companies in number of investments and quantum of investment does not reflect our relative strength in r&d.

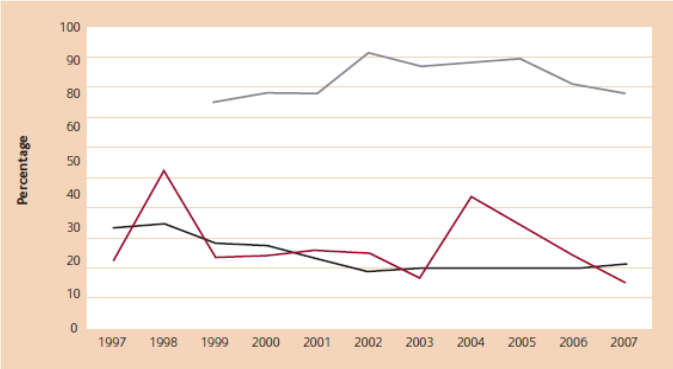

Figure 5:
Early stage investment as a % of total VC investment

Source: *BVCA, IVC, NVCA*

3. As can be seen from the above, whilst neither the UK nor Israel could hope to compete with the US in absolute terms, neither do we compete in relative terms in early stage and have recently fallen behind the US[5].

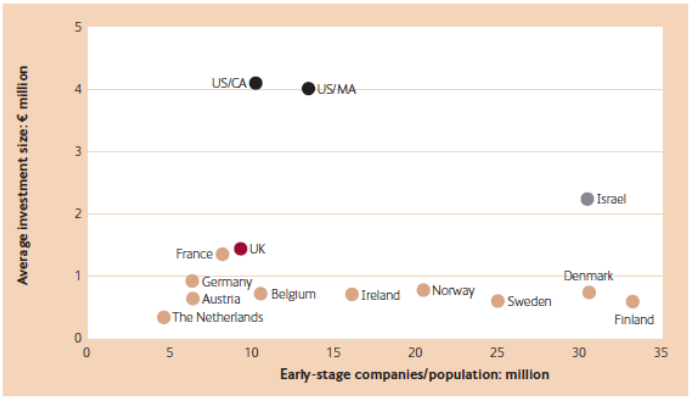

Figure 6:
Investments per early-stage company

Source: *Maula et al. (2007)*[19]

4. In terms of the size of investments made (and the quantum), the UK and France are very close together as is Germany. But the US invests much more per investment as does Israel. This suggests investment in UK and EU early stage is spread much too thinly[6].

5. Regression analysis in the benchmarking report highlight three determinant factors in explaining levels of activity; higher levels of entrepreneurial activity, R&D expenditures as a percentage of GDP and visible success stories on the stock market affect early stage and total venture capital activity. The analysis suggests that the supply side is attracted by success stories, while opportunities for entrepreneurs arise from technological exploration (reflected in the R&D measure). In-depth analysis shows that entrepreneurial activity in the UK is the most important of the three factors. We would expect that if entrepreneurial activity (in terms of creating high growth oriented ventures) was increased it would have a significantly higher impact on VC activity in the UK. Therefore one of the first areas of attention for policy makers is to increase entrepreneurial activity.

[5] Benchmarking UK Venture Capital to the US and Israel: What lessons can be learned? BVCA, 2009
[6] *ibid*

6. This is backed up by a 2010 survey conducted by Deloitte which says that in terms of what is important in fostering VC activity, 60% cite an improving entrepreneurial climate as key and 59% cite a strong R&D climate, supported by Govt. Only 35% cited tax and regulation as the most important element[7].

7. The BVCA welcomed the commitment in the Comprehensive Spending Review to protect the science budget but as the analysis above suggests, we must do more at the next stage when it comes to fostering entrepreneurial activity and turning research into commercial opportunities. Thus the £200m to be invested in Technology and Innovation Centres has merit as this will cut to the heart of the problem.

Fraunhoffer and the UK

8. The Hauser Report[8] described work done in other countries to add capacity through TIC-like institutions in the so called 'intermediate sector'. In France Carnot Institutes set up in 2006 foster links between a renowned research base and industry. In Germany Fraunhofer Institutes perform a variety of functions listed by Hauser as

- undertaking basic research;
- carrying out applied research in the innovation chain between university generated initial discovery and industrial development to realise its commercial potential;
- enabling SMEs to innovate though provision of knowledge, equipment and applied research;
- providing technical and commercialisation services to large and small companies; and
- developing a highly skilled workforce.

9. The Fraunhofer Model, is comprehensive in scope and geographical coverage with over 80 institutions (of which 58 are fully fledged Fraunhofer Institutes) with total funding of € 1.6 billion annually. It is clear that with initial investment of £200m we are not looking to create that scale here in the UK and nor should we. As Hauser notes:

"the role and rationale of TICs is therefore context dependent, which also includes the presence and nature of other academic or business centres of excellence; the balance of business sectors; and the importance attached by the public and private sector to innovation within a particular nation. This is an important point to bear in mind when considering the transferability of a 'model' from one country to another"r[9].

10. Fraunhofers also tend to focus upon "Technology Readiness Levels" (called TRLs) 4 to 7 (industry/applied contracts and government projects), whereas UK universities are traditionally strongest in TRLs 1 to 3 (blue sky and early stage translational research). However, in the best research intensive universities, there is a strong overlap, both in people, equipment and funding bodies between the TRL 1-3 stage and the TRL 4-5 stage.

11. This is a major strength in the UK and leads to better and more creative outcomes. We should not then see Fraunhofers as filling a completely empty gap, as there is already good work being done in that space by the best universities. These are precisely the universities

[7] 2010 Global Report on Trends in Venture Capital, Deloitte 2010
[8] The Current and Future Role of Technology and Innovation Centres in the UK, BIS 2010
[9] *ibid*

which also tend to have critical mass/active technology transfer offices with dynamic and productive VC links, such as at The University of Manchester, Cambridge and UCL.

12. The Fraunhofers, as a specific initiative, have more recently championed and catalysed a number of Translational Innovation Clusters, which look to build upon existing areas of expertise and contacts, in regions and fields of critical importance to the relevant national economies in which they are based. So promoting clusters in which venture capital and universities can "sit" together as part of an enterprise landscape and add value together is worthwhile. This aspect of the Fraunhofer model would be welcome – especially if centred in those areas which could pick-up and build upon existing activity – particular consideration should be given to existing sectoral expertise as can be seen from the examples below.

13. So we need to be particularly mindful of overlap when it comes to implementation because it is clear from the list of Fraunhofer functions above, that the UK already has existing capacity in many of those areas and any new provision through TICs must dovetail effectively with it. University of Manchester Intellectual Property is engaged in activity that would certainly fall into Hauser's 'intermediate sector', for example managing IP created at the University and then following evaluation, helping to commercialise it via sale, licence or spin-out. They have helped raise hundreds of millions for spinouts and are now licensing at a rate of 20 per annum

14. **Case Study – UMIP and NanoCo:** With VC partners, UMIP raise some £175M into spin-out companies in the last 5-6 years. This represents 85 transactions during a very difficult economic climate and of which about half were in the very early venture space (seed capital). From selling shares in some of those spin-outs (and from other sources) they have been able to initiate about 100 proof-of-principle programmes in new tech transfer intellectual property projects, which will give rise to many new start companies/spin-outs and licences over the next 5-6 years. An example of a Manchester University spin-out staring life as a proof-of-principle project is NanoCo. Although originally set-up in 2001, it received its first seed capital injection in late 2004. It makes and commercialises fluorescent nano-crystalline particles (quantum dots) of semi-conductor materials that have unique chemical, electronic and optical properties, due to their small size. The dots are so small that 80,000 of them can fit across the width of a single human hair, and have applications in biological marking, flatscreen TVs, security and clean-tech. Having received two rounds of institutional venture capital following the 2004 university and VC seed round, NanoCo now has partnerships with major industrial firms and is today valued on the stock-market at £200M

15. **Case Study - UCL and pharmaceuticals:**

    GSK: UCLB have announced partnerships with GSK on a three year strategic collaboration to investigate new compounds to treat potentially sight-threatening disorders.

    Pfizer: They have also announce a collaborative project with Pfizer Regenerative Medicine to research a better understanding of stem cell-based therapies for certain ophthalmic conditions.

    AstraZeneca: UCL and Astra Zeneca have entered into a collaboration to develop regenerative medicines for diabetic retinopathy (DR)

Summary and Conclusion

16. BVCA research suggests that there is work to be done in turning a world class research base into a burgeoning market for high growth companies that can attract venture finance and become the global titans of tomorrow. Whilst closing this gap has many facets, one such facet is further provision in the intermediate sector through institutions like Fraunhofers and our own TICs. However, the wholesale application of such a network of institutions is not financially viable (with £200m) nor is it practically necessary because of extensive existing provision. Before deciding on how to deploy this capital, an audit of existing provision is essential so that a clear understanding of coverage and best practice is gleaned and where appropriate, this can be replicated where provision is currently lacking. This may involve investing in new standalone institutions or it may involve adding to existing capacity. Government should not be wedded to either approach but should simply deploy the money where it will be of most use. An extensive consultation with the university, venture and business angel sectors should be the starting point.