Innovative region: Scotland

A region of surplus creativity but a dearth of funding

Tim Lafferty

The Scottish inventor of the television, John Logie Baird, may be long dead but innovation in Scotland is still alive and well as the home of innovations from magnetic resonance imaging (MRI) scanners and the automated teller machine (ATM) to animal cloning – Dolly the Sheep was Scottish.

The launchpad of the innovation ecosystem in Scotland, a part of the UK, is its world-class university system. Dundee and St Andrews universities are ranked in the top 10 scientific institutions in the world for scientists. Between 2009 and 2011 four Scottish universities were in the top 10 in UK for the number of companies spun out, according to a survey by the charity PraxisUnico *(see table below)*.

Glasgow and Strathclyde universities are renowned for material sciences and semi-conductors. Strathclyde is building an £89m ($145m) technology enterprise centre to house up to 1,200 researchers, engineers and project managers. Abertay University, Dundee, is a centre of excellence for gaming software.

Edinburgh University excels in life sciences and information technology and its BioQuarter research park is home to about 1,200 scientists. Edinburgh University's informatics department is particularly impressive, with 500 researchers and 250 PhDs, rivalling US peers Massachusetts Institute of Technology, Carnegie Mellon and Stanford.

Colin Adams, director of commercialisation at Edinburgh Informatics, said: "We are a talent magnet – less than half our students have a UK passport, and big companies need those computer science skills – companies like Amazon, Adobe, Cisco and Toshiba Medical Visual Systems have development centres here, and about 80% of their local hires are our graduates. A technology cluster is beginning to grow."

Edinburgh Informatics, which focuses on cognitive science, computer science and artificial intelligence, generated 43 spin-out companies between 2006 and 2011.

One successful spin-out from Edinburgh University is fantasy sports company FanDuel, which received seed funding from venture capital firm (VC) Pentech Ventures and the state-backed Scottish Enterprise Fund. VC Piton Capital joined a further funding round for FanDuel in ▶

Top 10 universities in the creation of spin-outs 2009-11
(previous year's ranking in brackets)

1	(1)	Edinburgh	16
2	(5)	Oxford	12
3=	(2)	Newcastle	8
3=	(4)	Strathclyde	8
3=	(6)	Warwick	8
6	(3)	Imperial College London	6
7=	(7)	Aberdeen	5
7=	(10)	Heriot Watt University	5
9	(7)	Cambridge	4
10	(9)	Queens University Belfast	3

2011. Covering the deal, the US online news service TechCrunch wrote: "Based in New York and Scotland, FanDuel focuses solely on US sports and since 2009 has offered a different take on the traditional fantasy sports game model."

That sentence is telling on two fronts. First, that Scotland clearly is not front-of-mind in the global innovation ecosystem, despite its talent pool. Second, because FanDuel has identified that the home market in Scotland is relatively small, so its customer base should be in the US.

While some accuse Scotland of being better at innovation than commercialisation, early-stage investing is helped by a well-established and active angel network. Linc Scotland, the angel trade association, has 19 angel syndicates as members and works to foster collaboration and share best practice. The best-known member, and one of the world's biggest angel syndicates, is Archangels, which this year celebrates its 20th anniversary. It has four full-time investment managers who invest about £10m in 20 deals a year.

Last year, the UK government's Capital For Enterprise programme launched the Angel CoFund, a £50m co-investment fund to invest alongside angel groups.

There are, however, few VCs in Scotland apart from Pentech Ventures and Scottish Equity Partners (SEP) and both invest across the whole of the UK. About 30% of SEP's portfolio companies are in Scotland and of the 193 VC-backed technology deals in the UK and Ireland last year, only 21 were Scottish, according to corporate finance boutique Ascendant *(see table overleaf)*.

Stuart McKnight, managing director of Ascendant, said: "Scotland has always been as entrepreneurially active as other parts of the UK, but its tech businesses have tended to attract less capital and investment. While the causes of this are debatable – lack of venture capital, niche opportunities [targeted by the entrepreneurs requiring less capital] or low levels of management ambition – the pattern is well entrenched.

"To break out of this rut Scotland needs to expand its pool of well-financed professional VCs, encourage companies with global opportunities and find management with the vision, drive and skills to deliver success."

A spokesman for SEP put the onus on the entrepreneurs, saying: "From our perspective, the challenge is not really about the supply of capital but on the demand side. We would like to see more of the companies that come to us for funding to be at a stage where we can realistically invest in them."

Recognising that London, the UK capital in England, dominates venture investment in the UK, and that there is a lack of available capital above £2m, the Scottish regional government has taken a number of initiatives to stimulate start-up activity. State agency Scottish Enterprise supports 1,600 companies and its Scottish Investment Bank manages three equity funds – the Scottish Seed Fund, Scottish Venture Fund, Scottish Co-Investment Fund plus the Scottish Loan Fund. As a whole, Scottish Enterprise invested £23m alongside £53m of private capital in 109 Scottish companies from 2010 to 2011. Scottish Enterprise also works to encourage inward investment, for example working with industrial group Dow Chemical to source dealflow.

Another state agency, Highlands and Islands Enterprise, supports initiatives in the north of Scotland, particularly those that reflect the remote nature of communities there, such as tele-health and marine renewables. It is working with other government organisations, including the Technology Strategy Board (TSB) and the National Health Service, on the £23m Dallas (delivering assisted living and lifestyles at scale) project, trialling a digital health platform across Scotland.

Government initiatives have tended to focus on specific sectors and one of the most active and successful is clean-tech. State-backed Carbon Trust provides guidance and support to renewable technology companies and up to £500,000 of funding. Three recent examples of the Carbon Trust's work are:

- Heliex, a technology which recovers energy from ▶

steam, received a £2m equity investment from oil major BP in 2010 and a further £5m in a round in 2012, including Irish utility company ESB's corporate venturing unit Novusmodus.

- Artemis, a wind-power company recently acquired by Japanese industrial group Mitsubishi.
- Scotrenewables, a floating tidal concept that has received equity investment from French energy company Total and Norwegian energy and shipping company Fred Olsen Group.

Carbon Trust has two offices in Scotland and Steve Wyatt, its head of technology acceleration, said: "We use government money to reduce risk for the end market."

Carbon Trust is also working directly to engage corporates. For example it provides a paid service to US-based industrial conglomerate GE to help identify suitable companies for its Ecomagination accelerator programme. The trust has also established a consortium of eight UK utilities, including Scottish and Southern Energy (SSE) and Scottish Power, to solicit technology solutions as part of the UK's Round 3 Offshore Wind Programme.

There are a bewildering number of government support platforms in the clean-tech sector, including the Business Growth Fund, the TSB, which this year opened a "catapult centre" in Glasgow to accelerate renewable energy technologies, and the Green Investment Bank based in Edinburgh with a £3bn fund.

Corporates are investing in the sector too – this year wave technology company Acquamarine Power raised £7m in a round comprising SSE, power and automation company ABB and Scottish Enterprise. But in a move away from direct investing, SSE sold most of its portfolio companies to SEP earlier this year.

Life sciences in Edinburgh is an active sector with a celebrated history – penicillin was discovered by Scotsman Alexander Fleming – and has particular strengths in stem cells, animal health, genomics, aquaculture and synthetic biology. Edinburgh University's BioQuarter incubator is well established, while BioCity Scotland opened in Newhouse this year following the success of BioCity Nottingham. BioCity Scotland is home to 10 companies so far.

Again there is a funding gap in life sciences and an overreliance on the medical device sector, but a US early-stage biotech VC is rumoured to be opening an office in Scotland later this year and is raising a fund.

Despite the best efforts of government and a few corporates there remains an issue of scaling and a lack of growth capital. Nevertheless there have been successes. Rocela, an anagram of Oracle, an integrator and consultancy of Oracle software, doubled its turnover in 2010 to £29m. Semiconductor company Wolfson Microelectronics was a spin-out from Edinburgh University and is now listed on the London Stock Exchange. Skyscanner, founded in 2003 and based in Edinburgh, is the number-one travel search website in Europe, number three worldwide, and the fastest-growing globally, according to its VC investor SEP.

One issue cited by several commentators is lack of help and training for entrepreneurs to grow their business and pitch for investment. Jonathan Harris, editor of newsletter publisher Young Company Finance Scotland and organiser of a recent event attended by this author, with costs paid, said: "We really need instruments to help entrepreneurs, not just tell them what to do."

While some say the government could be doing more, ▶

Scotland vs UK and Ireland tech VC investment

	2006	2007	2008	2009	2010	2011	2012(H1)
Value (£m)							
Scotland	86	109	80	33	41	37	27
UK and Ireland	706	872	1,006	622	618	786	595
Volume							
Scotland	27	29	28	19	19	21	15
UK and Ireland	174	242	254	194	213	193	124
Average deal size (£m)							
Scotland	3.2	3.8	2.9	1.7	2.2	1.7	1.8
UK and Ireland	4.1	3.6	4.0	3.2	2.9	4.1	4.8

Source: Ascendant

Scotland's innovation ecosystem

Universities	★★★★★
Angel networks	★★★★
Government support	★★★★
VC community	★
Corporate support	★★

Carbon Trust is already providing tools and training in the clean-tech sector and Scottish Enterprise is starting to become more active in that way too, according to Liz Fletcher, senior executive in the life sciences team. She said: "We are working with companies on proof of concept to assist with international export and we provide mentoring and one-to-one support."

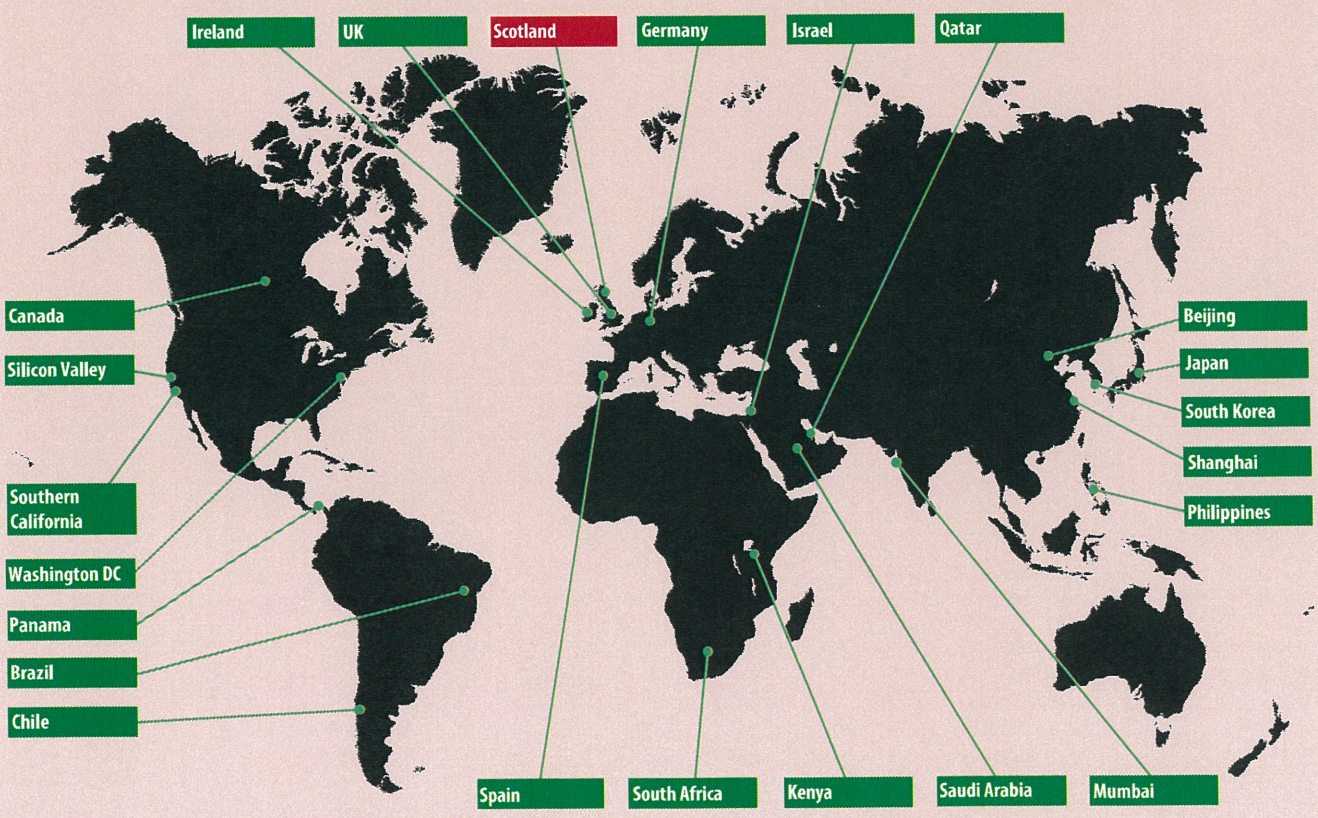
The Saltire Foundation charity arranges placements and training for up-and-coming Scottish business leaders, in partnership with Babson College Boston business school in the US.

Many Scots are increasingly optimistic about Scotland's business future. Sandy Finlayson, senior partner at local law firm MBM Commercial, said: "Thanks to the initiatives shown by universities there is a buzz and excitement here that did not exist three years ago. But we could really do with more corporate investment and it is a great opportunity for them – we have some fantastic innovation but little competition for deals, which means pricing is lower than in England. A good start would be if some more corporates could attend Edinburgh University's Engage/Invest/Exploit conference next year."

The event, on May 9, will showcase about 50 local entrepreneurial companies in the biotech, technology and clean-tech sectors.

One corporate that needs little convincing of the merits of Scotland is Germany-based industrial conglomerate Siemens. Rudolf Freytag, chief executive of Siemens Technology Accelerator, said: "With the creation of our third start-up company in Edinburgh, Scotland has become one of the major investment locations for us. We highly value the existing mix of excellent scientific and economic environment, highly-skilled people, good financing opportunities and quality of life."

A referendum on Scottish independence is due to take place in autumn 2014, creating uncertainty for investors in the meantime. Privately the local business community is worried, with one observer, who wished to remain anonymous, saying: "I see nothing positive at all in the situation. It is ridiculous."

But if corporates can live with that political uncertainty, Scotland is a land of opportunity. ■

Global Corporate Venturing has covered these innovative regions round the world. To see the state of venture investing and the broader innovation landscape in each region check out *www.globalcorporateventuring.com*