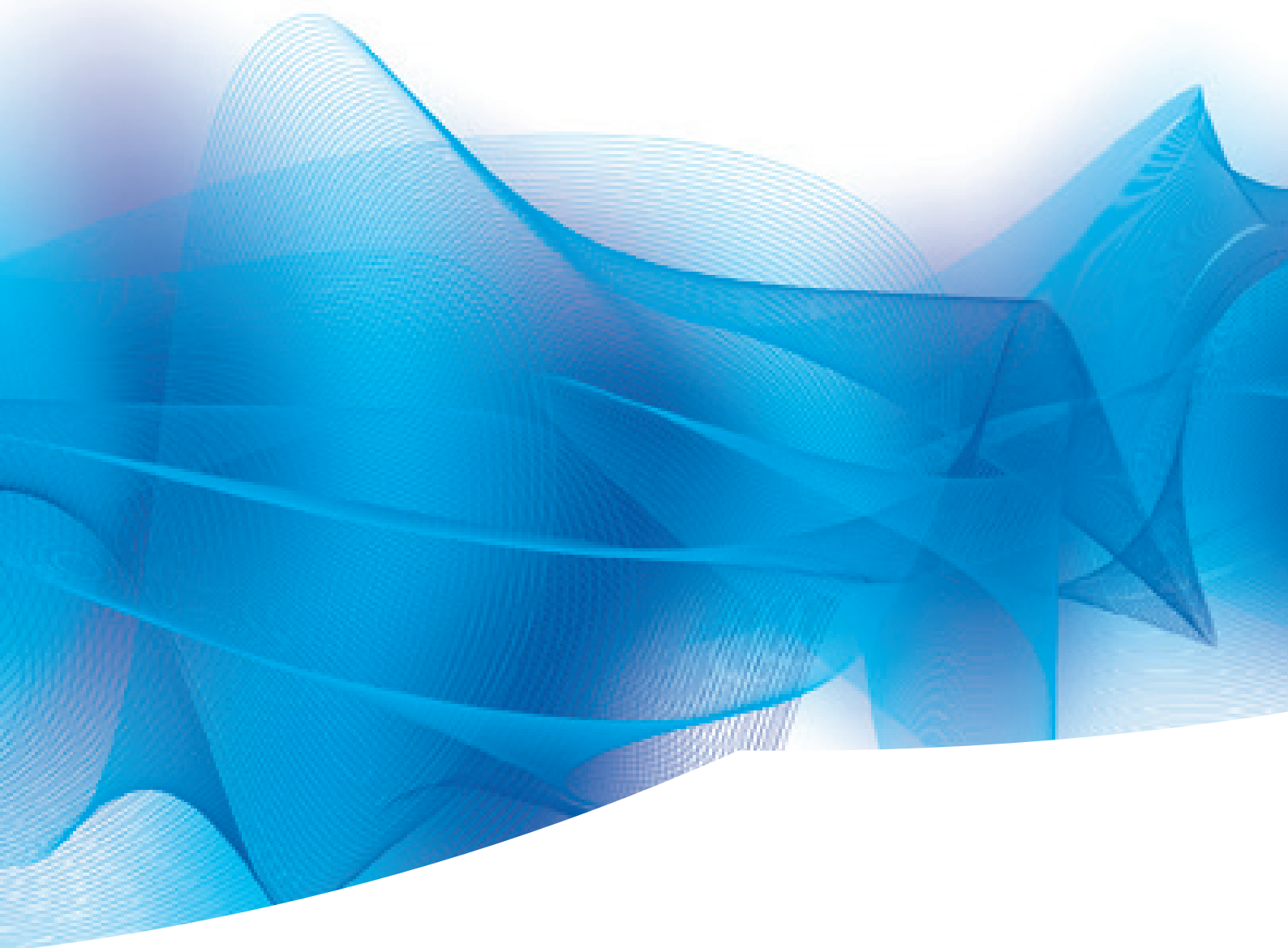


The Risk Capital Market in Scotland 2009 – 2011



Contents

Tables and charts	3
Executive Summary	4
Introduction	6
Purpose	6
Background	6
Approach	7
Consultation interviews	7
Report Findings	12
Key trends	12
Trends in investment value	12
Investments by size band	13
Sectors	16
Participants In The Early Stage Risk Market	19
Types of investor	19
Companies	25
Equity Gaps	28
Exits	30
International Comparisons	32
Informal investment – business angels	32
Venture Capital	33
Main Findings	35
Suggested Next Stages	37
Implications For Scotland	39
The risk capital market: an overview	39
Why venture capital matters	41
Venture capital in crisis?	42
A new funding environment	44
The funding escalator	46
Exits	48
Exit Routes	50
Conclusion	51
Appendices	54
Appendix 1: Glossary of key terms	54
Appendix 2: Definitions and exceptions	56
Appendix 3: Methodology	57
Appendix 4: Investors by type and location	58
Acknowledgements	59
Authors	60

Tables and charts

Tables

1. Numbers and amounts of investment, by year	13
2. Top ten investments 2009-2011	14
3. Regional distribution of angel investments	21
4. Regional investment by sector	25
5. Trade sales of early stage Scottish companies 2009-2011	30

Figures

1. Trend in investment value 2005-2011 (£m)	12
2. Investments by band (£m)	13
3. Types of investor by band (£m)	15
4. Sector investment by band (£m)	15
5. Investment by sector (% , £m)	16
6. Angel investment by sector (% , £m)	16
7. VC investment by sector (% , £m)	16
8. Total investment by investor type (%)	19
9. Investments by angels and VCs (£m)	19
10. Activity levels of angel groups	20
11. Activity levels of VCs and institutions	22
12. VC investment in sectors, by origin (£m)	22
13. VC investments, by location of investees	23
14. SIB co-investment with angel groups (% , £m)	24
15. SIB co-investment with VCs (% , £m)	24
16. Age of company at date of investment (£m)	25
17. Investment by location of investee (% , £m)	26
18. Middle band investment by location of investee (£m)	26
19. Investments in Scottish university spinouts (# , £m)	27
20. Investments in Scottish university spinouts (% of total)	27
21. New (first time) and follow-on investments, by number	29
22. New (first time) and follow-on investments, % of funds invested	29
23. Global annual VC investment	33
24. VC technology investment	33
25. EVCA member investments	34

Executive Summary

This Report provides a detailed and comprehensive analysis of the early stage risk capital market in Scotland, based on a deal-by-deal analysis of equity funding by independent investors in Scottish companies for the calendar years 2009 to 2011. It is the latest in a continuous series, built on a robust and consistent methodology that dates back to 2003, of which the most recent was published in October 2009, when the effects of the global financial crisis were very apparent. Although only some 2% of SMEs looking for external finance seek risk capital investment, it is especially important for those early stage businesses that have been identified by independent research as new, young technology advanced ventures with significant potential for growth in international markets and the creation of high value employment¹.

Despite a period of unprecedented economic uncertainty, the Scottish risk capital market has held up relatively well, especially in the deal band size between £100k and £2 million.

Following the impact of the dot.com bubble, investment in Scotland's early stage companies reached a low point in 2005, then recovered and stayed constant, despite the economic downturn, before reaching a six year high point in 2010. The investments tracked by this report present a distinct decline in 2011; however evidence from the first few months of 2012 show investment levels at recent norms, possibly indicating that the decline in 2011 was caused more by the timing of large investment deals than evidence of a continuing downward trend.

Most of the year to year fluctuations in the overall level of investment are accounted for by the variability of deals over £2 million. With only 8 to 17 deals over £2 million annually, the overall level of risk capital investment continues to be susceptible to variations in a small number of projects.


The middle band of investments (£100k to £2 million) gives a better picture of how the market is constituted, as it includes over two thirds of the deals. This middle band has held up over the long term, whereas deals both below £100k and over £2 million have fluctuated from year to year, with disappointing results in 2011.

There has been an increase in follow-on investments in portfolio companies rather than new investments, with over 90% by value of investments in 2011 being follow-on rounds. However, the pattern is variable, and the percentages in 2009 and 2010 were similar to those in 2005 and 2006 (either side of the 80% mark), with 2007 and 2008 showing higher levels of 'first time' investments.

Investments over £2 million represent a large share of the total market, but are few in number: 11 in 2009, 15 in 2010, and 10 in 2011. A perusal of deals listings by those venture capitalists (VCs) which publish figures suggests that Scotland appears to fare worse than other regions of the UK in securing large investments from VC firms, and most of those that have invested in Scottish companies do not do so on a regular basis. VC firms themselves are going through a period of considerable change, as set out in Professor Colin Mason's commentary in the 'Implications for Scotland' titled section of this report. From the consultations held in parallel with the data research, it became clear that there is scope for Scottish companies to increase substantially their engagement with VC firms outside Scotland; however, increasing the level of investment above the £2 million per deal level is a question of building demand, encouraging companies towards not only better promotion but also more compelling propositions.

At the opposite end of the scale, investments under £100k were in 2011 at their lowest level for seven years, in terms of both number and amount invested. This end of the market is also experiencing considerable change. Although angel syndicates profess themselves keen to invest in new companies, they are held back by the need to support portfolio companies with more money over a longer period than before. VC firms have to all intents and purposes abandoned the start-up and seed phases of investment, now requiring companies to have achieved some market traction before they will invest. Despite these reservations, the last three years saw 101 companies secure investment for the first time (2009:31, 2010:42, and 2011:28). But for the future it looks as though new funding mechanisms and business models, for example crowdfunding and lean starts, will play more of a part for start-up companies.

1. www.bis.gov.uk/assets/biscore/enterprise/docs/a/11-p116-annual-report-business-angel-market-uk-2009-10.pdf



In the middle size investment band, business angel investment has held up well, considering the difficulties which syndicates face in providing increasing amounts of follow on finance to a mature portfolio of companies while keeping their membership keen to invest when there are limited exits and realisable returns. Funds are certainly limited, meaning that investors are more selective, but they require the quality of the investment propositions to keep pace.

The majority of angel-led investments are in the East of Scotland and the share accounted for by the West has fallen sharply in 2011. This regional distribution is long-standing, and appears to be widening. While investment naturally flows to opportunities, stimulating demand from growth orientated ventures located in the West remains a major challenge.

The life sciences and renewables sectors are major recipients of early stage risk funding, impacting on the long held dominance of enabling technologies. While enabling technologies continue to lead sector investment with 31% of the total (2009-2011), life sciences follows at 29% with renewables at 22%.

Exits and the liquidity they bring is key; the various supply side measures, notably co-investment, have allowed investors to maintain a level of activity and hence have helped keep investment levels and activity higher than would have otherwise been the case. Exit opportunities are being severely curtailed, reducing investors' capacity to recycle investment into new ventures. Investors depend upon exits such as flotations or trade sales to make returns on their money which can be used to re-invest in further emerging ventures. Companies and their investors have had to be patient, with the average age of an investment reaching an exit in 2010 averaging 9 years; in 2011 it was 10 years.

An earlier market report (2008) commented: "Under current market conditions a continual flow of new investors will be needed to maintain the capacity to invest in high growth start up and early stage ventures". When the Co-Investment fund was launched in 2003, there were only two established angel syndicates and four relatively new syndicates. As a result of the policy focus on this area, ten new syndicates have been created since 2008, resulting in a current total of 19 syndicates investing in Scottish growth companies.

The final section considers the policy implications arising from the report findings, and seeks to set these in a wider context considering international developments and trends impacting on equity investment as a whole.

Introduction

Purpose

The purpose of this report is to provide a detailed and comprehensive analysis of the early stage risk capital market in Scotland for the calendar years 2009 to 2011. The report informs Scottish Enterprise's understanding of the market to support its investment interventions. Using a methodology that has captured market activity since 2001, the report is one of a series of which the most recent, was published in October 2009, when the effects of the global financial crisis were very apparent, and the future of the global economy and its financial markets was difficult to predict.

The report is intended to improve the understanding of the scale and characteristics of the early stage risk capital market in Scotland for a period when the economy experienced considerable turmoil. It identifies the contribution made by risk capital investment to business ventures in Scotland and provides evidence for the development and evaluation of policies to stimulate the market.

When considering the figures presented in this report, not too much significance should be attached to relatively small movements in metrics over the timescale of a small number of years, since large one-off deals over £2 million, and the timing of their completion, can distort the annual figures. Movements over a longer timeframe may indicate emerging trends and help to analyse longer term changes in the market. The report is therefore set out to allow consideration of market features and trends over the medium to longer term.

Background

Access to a strong supply of early stage risk equity capital is important for national and regional economies due to the catalytic role that it plays in the entrepreneurial process. UK and Scottish Government policy recognises that the market does not always enable SMEs to grow rapidly because of the existence of equity gap(s) beyond the levels banks will lend and beyond the means of most informal investors and business angels, but below the level usually considered for venture capital funding. Although only some 2% of SMEs looking for external finance seek risk capital investment, it is especially

important for those early stage businesses that have been identified by independent research as new, young technology advanced ventures with significant potential for growth in international markets and the creation of high value employment.

The Scottish Government Economic Strategy commits to maintaining and further investing in a supportive business environment to create the right funding conditions for growth companies, supporting growth sectors and enabling companies to take advantage of growth markets. The main driver for sustained economic recovery is identified as improved levels of private sector investment which requires appropriately functioning capital markets. The Scottish Government is committed to a range of actions under the Access to Finance initiative, with the objective of building a sustained economic recovery². This objective is directly supported by the creation of the Scottish Investment Bank (SIB) to provide enhanced access to finance for both early stage and established businesses that exhibit growth and export potential. Many of these companies are pre-revenue and are not able to secure bank lending facilities. Access to risk capital is crucial to the entrepreneurial process to support innovative companies and their growth and is even more so during an economic downturn.

The Scottish Enterprise Business Plan (2012-2015) sets out an ambition to help make Scotland more globally competitive and to tackle the current constraints that companies face in unlocking finance for growth, and reinforces the Scottish Government focus on growth companies. SIB has a critical role to play, in collaboration with the banks and private sector investors, in improving both the supply of investment finance, assisting companies in accessing appropriate funding and supporting companies to implement their growth plans, alongside other Scottish Enterprise (SE) operations. SIB's ambition, approved by the SE Board, is to support Scotland's economic development by:

“growing Scotland's private sector funding market to ensure that both early stage and established SMEs with growth and exporting potential have adequate access to growth capital.”

In response to the current economic challenges, it is recognised in the SE Business Plan that weak demand

2. <http://www.scotland.gov.uk/News/Releases/2012/06/finance210612>

and constrained access to finance are significant risks to economic recovery. From an investment perspective, SE has made a commitment to tackle the current constraints that companies face in unlocking finance for growth, by providing investment opportunities and attracting new investors to support the growth of target companies and sectors.

The Scottish risk capital market continues to be fragmented with limited visibility. This presents challenges when determining the extent to which it is efficient in how it functions in channelling growth finance to early stage companies. In response, SE commissions research to identify the investment activity of all participants and to estimate the total flow of risk capital investment into early stage Scottish companies. This includes characteristics of the industry key players and beneficiary companies and the scale of the annual flow of new investment and whether there is evidence of gaps in the supply of risk capital. SE uses this analysis to help quantify the impact on the market of its early stage equity investment vehicles (the Scottish Seed Fund, the Scottish Co-investment Fund, and the Scottish Venture Fund) to ensure that SE interventions remain 'fit for purpose' and optimise economic impact.

Approach

Full details of the methodology adopted are given in Appendix 3. The approach builds on earlier reports in the series, using a robust and consistent methodology and is intended to separate actual flows of funds from the so-called 'headline' investments. These are the figures quoted in press releases and other statements by investors and investees, and include the total equity commitment (which is usually invested in tranches after the investee reaches agreed milestones). These headline announcements also often include non-equity finance such as bank facilities and grant awards.

This report covers only equity investments by independent third party investors, so each deal was examined to remove investments by founders and management, and investments in the form of convertible loans (which are only included if converted into equity) or other debt.

Convertible loans are included at the date of conversion into shares. In fact, there has been a recent trend for business angel syndicates (together with the Scottish Investment Bank's Co-investment and Venture Funds) to

provide loans to portfolio companies; this is discussed further below. The amount of such loans, not included in the figures in this report, totalled over £6 million for the last three years.

Also excluded from these totals are the investments by individuals associated with the investee companies (founders, directors, management), which accounted for over £20 million during the three year period.

Consultation interviews

In parallel with the quantitative research for this report, a series of consultation interviews was held with a range of different stakeholders in the risk capital market, 37 in all – investors (17, of which 10 were angel groups and 7 VCs), entrepreneurs (6), non-executive directors representing several young companies (3), intermediaries (5), universities (2), and senior Scottish Enterprise staff (4). This was followed by a workshop on 22nd February, with 14 invited participants, at which early findings of the research were presented and discussed.

The consultation interviews uncovered a wide range of different views on the state of the risk capital market in Scotland, and on how it should be developed in the future. Several intertwining issues emerged, addressed from a variety of viewpoints, and these are discussed below.

Since the main interviews were carried out, further detailed discussions were held with a small number of people closely involved in the sector, to try and establish the key themes for the sector in Scotland. These have been helpful in bringing the main issues together.

One fundamental message coming through the interviews is that the market must be considered from the demand side, as well as from the analysis of access to and supply of finance. Although many companies fail to get the funding they seek, it is widely acknowledged that simply increasing the supply of funds would not of itself lead to the creation of many world-class businesses. Investors and advisers both lament the lack of market awareness in the business plans they encounter. It can be difficult to distinguish cause and effect when discussing this issue – would a greater flow of market-ready propositions attract more capital into the sector, or would more capital encourage the creation of more and better businesses?

It is sometimes necessary to remind ourselves why the formation and growth of technology advanced companies is important. This is well articulated in a recent report by the MIT Sloan School of Management³, commenting specifically on university spinouts, but the message relates to all similar companies: "Research and technology intensive universities, especially via their entrepreneurial spin-offs, have a dramatic impact on the economies of the United States and its 50 states . . . From our extensive data collection and analyses, we conclude that, if the active companies founded by living MIT alumni formed an independent nation, conservative estimates indicate that their revenues would make that nation at least the 17th largest economy in the world." This has taken time to achieve, and depends upon cumulative effects. The UK is still a long way away from this realisation, but the message is loud and clear – for any economy which manages to harness this potential, the prize is more high-quality jobs, more sustainable businesses, and an ecosystem which helps to create more of the same.

The Report's author has summarised the views expressed in these consultations into the following observations.

The market has a long timescale

It can take years to prepare a technology to the point of commercialisation, and years more to achieve market penetration with associated costs. A number of observations follow from this.

- **Year on year changes are not significant.** Not too much significance should be attached to relatively small movements in metrics over the timescale of a small number of years; larger movements may indicate emerging trends and help to analyse longer term changes in the market, but there is considerable variation in some metrics from year to year (e.g. VC investments), within boundaries which are constant over a longer term.
- **Some relatively new aspects of the current market might not persist:**
 - *Young companies are finding it much more difficult to secure bank loans.* Given the pressure on banks' lending criteria, this situation is unlikely to change where companies have no assets, or insufficient

revenue to cover repayments. However, many companies at a later stage, close to or generating revenue, are also experiencing considerable difficulty in securing bank loans; this may change over time, but there are conflicting statements from banks which are hungry for deal flow, and young companies which are still being turned down.

- *The prolonged economic crisis across the world is creating uncertainty which is holding back markets everywhere.* Some aspects of the risk capital market in Scotland (e.g. the difficulty for start-up companies to achieve first sales) can be largely if not entirely explained by this uncertainty, and are not specific to Scotland. Others, such as the dearth of exits for investors, pre-date the current economic downturn and are part of a longer trend.
- **There has been some fragmentation of the market into discrete elements which have little interaction.** This is partly the effect of specialisation, with investors improving their performance by focusing on specific areas; if so, this is a trend which could persist and intensify. Examples include:
 - **Angel investors**, recognising the limits to the amounts they are able to invest in any one company, are starting to focus on companies which have funding needs which they can meet, and an exit route at a time and value which promise to make the investment worthwhile. In some quarters this has been castigated as a lack of ambition, or a restriction on company growth, but this is a misconception; this is what angel groups do, and are learning to do better. Angel finance will not be suitable for every company, but angels are efficient at providing funding for appropriate companies, which might struggle to find investment from other sources.
 - **VC firms** tend to focus on investments in companies which have already established some market presence, and have the potential to generate returns on relatively large investments. Although VCs need a business to be 'de-risked' to some extent, which might in principle be done by angel investment, these two types of investor have very little interaction at present, not only in

3. Entrepreneurial Impact; The Role of MIT, by Edward Roberts, Founder and Chair, The Martin Trust Center for MIT Entrepreneurship, 2011

the UK but also in the USA. There have been some moves by VCs recently to engage with business angels, but on inspection these are often bids to bring angels into a fund by offering qualification for EIS tax allowances and thus increase the fund's investment capacity. Some fund managers have previously offered EIS funds to individual investors, but a slightly different approach was taken recently by DFJ Esprit, which offers investors the chance to co-invest alongside the VC. This is needless to say not the same thing as investing in companies after angels have funded the initial stages.

- **Investments in the oil & gas** industry in Aberdeen form a separate category, characterised by technology companies started by industry participants, some local 'super angel' investors, and some international specialist VC funding. There is little interaction with non-specialist investors from outside the industry.
- **Digital media** is another sector which can be regarded as 'fragmented' from other parts of the risk capital market. Companies in this sector have low start-up and development costs, and are predominantly business-to-consumer ventures which have the potential of rapid global growth if they can exploit online marketing effectively. The sector is very competitive, with a number of specialist VCs investing large amounts. Despite being digital businesses, they tend to cluster in development hubs, often supported by cashed-out industry entrepreneurs.
- **Getting good people into early stage companies is a crucial step towards commercial success.** It takes time to build a stock of suitable managers – the best candidates are often those who have successfully started and grown companies and enjoy the challenges of working in a small early stage business. There are some examples in Scotland; as an illustration of the interrelatedness of the factors being discussed here, it will take more 'exits' to enlarge the pool of serial entrepreneurs. This way of generating new managerial talent is a key outcome of the cycle in which companies are grown and then sold, and does not happen with companies which continue to grow organically. Leadership skills are crucial and this includes relationship building with existing and potential investors.
- **There is a 'spectrum of influence' – interventions at different levels which can help the development and growth of companies – which covers the long time scales involved.**
 - At one end of the spectrum are issues which are needed to generate the entrepreneurial ecosystem described by MIT in the quotation above, such as generational changes in attitude, the expansion of business education more widely, making public procurement spending more accessible to young indigenous companies, and creating taxation programmes which incentivise investors and entrepreneurs. Individuals and organisations which are involved in the sector, although not directly involved in making decisions on these matters, should not underestimate the influence which their views can have.
 - At the other end of the spectrum are those interventions which can have an immediate effect on the working of the market, such as grants for R&D or for export activity, or new commercialisation initiatives. However, effective commercialisation has a long timescale, and some observers were concerned that policy makers should ensure that such initiatives are given time to develop in the light of experience gained in the early years.
 - **All participants in the risk capital market are on a learning curve,** and should be improving with time. One example is angel syndicates, which are likely to make better investment decisions as they become more experienced; this experience takes time to accumulate. There are unrealistic assumptions on the part of both investors and potential investees about how much time and how much funding will be required to grow a business to an 'inflection point', and from young companies about the conditions attached to funding of all types. There is scope for young companies (and their advisers) to learn more about the range of financing options available, in particular from venture capital investors outside Scotland. The risk capital market provides much more than early stage funding. The expertise embedded within the extended networks of the main investment providers is crucial in supporting business innovation and growth.

There is much that is working well

It is perhaps a Scottish shortcoming to focus on comparisons which show the country to be underachieving, and subsequently to become defensive. The danger is the temptation to drop support for what is working well, in favour of untried new initiatives.

- **Investment levels have held up during the prolonged global financial crisis.** In particular, according to the 2009-2010 BIS report on business angel investment noted that angel investment in Scotland had slightly increased, whereas elsewhere in the UK it fell by 19%.
- **Scotland has a wide diversity of sectors where innovation and entrepreneurship play a key role in the performance of the early stage risk capital market.** The three main sectors identified in this report – enabling technologies, life sciences, and energy – each embrace a wide variety of activity; as examples micro and opto electronics, and sensing and measurement in the case of enabling technologies; drug development, medical devices, and research organisations in the case of life sciences; and oil & gas, smart grid technology, and all types of renewable resources and cleantech in the case of energy. Many other countries are able to support just one or two of these.
- **There are some very positive aspects of the risk capital market in Scotland,** which deserve much greater publicity:
 - *The Scottish Co-investment Fund (SCF)* is regarded by many other countries as a world-class example of a public sector intervention which has been effective in supporting early stage companies and in helping to grow the informal investment infrastructure. The SCF shared risk model, established in 2003, is seen as an exemplar and is recognised internationally, including by the European Commission⁴. Across the world it is seen as the ‘Scottish Model’ and has been replicated in countries such as New Zealand, Sweden, Canada, Northern Ireland, Finland and Estonia;
 - *The formation of angel syndicates* which streamline the investment process for individual angels, spread risks across a portfolio, and have greater investment ‘firepower’ than individual investors, is an achievement which many other countries would like to emulate (and owes much of its success to the productive collaboration with the SCF). They use their experience to advise companies in their portfolios as part of the professional and specialised advice that growth companies require;
 - *Scotland’s universities*, besides having high ratings for research excellence, also create more spinout companies than universities in other regions of the UK;
 - Although not much publicised, many individual investors in Scotland have made *very significant returns* from investing in early stage companies;
 - Trade sales sometimes result in the establishment of a global ‘*centre of excellence*’ in Scotland where the international corporate acquirer builds a team around the original company, creating jobs and providing additional resources, which allow the business to achieve objectives which would have been out of reach on its own. It must be added that some observers lament trade sales at an early stage of a company’s development, pointing out that by remaining independent the company’s profits are retained in Scotland; this benefit is to some extent offset by the potential for trade sales to create a flow of experienced managers.
 - **These positives need to be better publicised.** They are often overlooked by participants in the market, and need to be communicated to others currently outside the sector, including high net worth individuals who could become business angels, and institutions which might consider investing in the market through appropriate funds.

While there is much that is working well, there are also a number of challenges and these are set out in the following section.

The market is affected by a lack of exit opportunities for investors

It needs to be reiterated that all investors look for a return on investment, which in today's context usually means an exit by way of a trade sale. In early stage investing, the potential returns need to be substantial to counter the risk, which implies that dividends are usually unlikely to offer a suitable return on an appropriate timescale. The limited number of exits and the increased length of time to reach an exit is not unique to Scotland.

All investors – VCs and angels – are affected. They are having to support portfolio companies for longer and with higher levels of funding, there is insufficient recycling of cash for investment in new companies, and it is difficult to keep their own investors (institutional partners in the case of VCs, individual angels in the case of syndicates as well as high net worth individuals considering entering the market) convinced that the returns on investment will be worthwhile (this is related to the timescale issue).

- **All investors – VCs and angels – are affected.** They are having to support portfolio companies for longer and with higher levels of funding, there is insufficient recycling of cash for investment in new companies, and it is difficult to keep their own investors (institutional partners in the case of VCs, individual angels in the case of syndicates) convinced that the returns on investment will be worthwhile (this is related to the timescale issue).
- **Not all companies are equally suitable for acquisition.** Some investments made early in the life of an angel syndicate can have difficulty in attracting acquirers, and syndicates have started to include exit considerations – time and funding required to reach exit, identification of potential acquirers, etc – into investment decisions.

- **There is little relationship between angel syndicates and VCs. Where angels and VCs co-invest,** this normally involves individual business angels rather than syndicates. However, at least one angel syndicate is contemplating approaching selected VCs as potential acquirers of portfolio companies, rather than as co-investors. In his commentary in the section 'Implications for Scotland' below, Professor Colin Mason sets out some of the reasons for this, but in the UK in general and in Scotland in particular (because of the prevalence of angel groups), since the time of the dot.com bubble at the end of the 1990s VC and angel investments have been two separate investment tracks, each appropriate to a different set of companies, with different growth expectations and different stages of development.
- **There is a widespread lack of understanding about the values achievable in trade sales.** In the UK and Ireland, 50% of technology exits are for under £25 million (in the USA the mean exit value is \$18m), which limits the amount that can be put into a business if the investor is to make a return. These parameters need to be built into the strategic plans for developing young technology companies.

Report Findings

Key Trends

Trends in investment value

Despite the continuing uncertainty in the global economic environment, early stage investing in Scotland has held up well over the three years covered by this survey. The total investment for this period is well over £300m in just over 500 deals.

While this latest report in a long running series is primarily concerned with the calendar years 2009 to 2011, using a robust and consistent methodology, it is helpful to view the latest position in context with earlier years to provide a time series comparator. The trend for the last seven years of available data from this series of reports is shown in Figure 1. This trend begins in 2005, which was the low point reached following the end of the dot.com bubble.

Overall, the market has remained remarkably steady during the economic turmoil in which it has operated, confirming the suggestion in previous reports that early stage risk capital is in some respects counter-cyclical, with investors attracted to participate in the market in a downturn as valuations adjust downwards and as entrepreneurs experience greater difficulties in accessing other sources of capital. In the latter respect this has been intensified under conditions of an SME credit crunch since 2008. Following the bursting of the dot.com bubble in the early years of this century, investment in early stage companies in Scotland reached a low point in 2005, but recovered and virtually 'straight-lined' for some years thereafter. The UK was in recession in 2008, but this hardly affected the risk capital market in Scotland, which went on to reach a recent high in 2010.

Trend in investment value 2005 - 2011

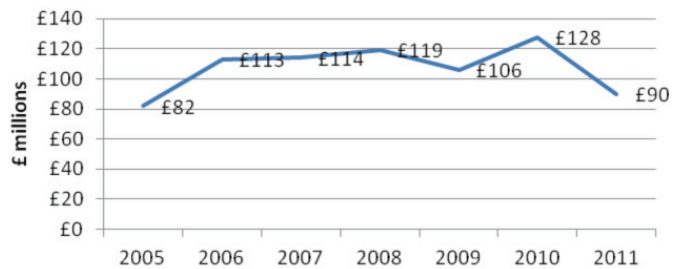


Figure 1: Trend in investment value 2005-2011 (£m)

The dip in investment in 2011 shown in the above chart is likely to be temporary rather than an indication of a significant trend. Firstly, it is very much affected by a reduction in deals of large value (over £2 million), which are very variable from year to year. Secondly, the indications of investment levels for the first half of 2012 show no decline; LINC Scotland's angel group members reported 'headline'⁵ investments of £15.5 million for this period compare with £10.3 million for the same period in 2011, and Ascendant's analysis of VC investment in ICT companies in the UK gives a total of £596 million for first half 2012, compared with £455 million in first half 2011 (with Scotland securing 17% of this investment in Q2). The LINC and Ascendant figures are compiled on a different basis from those in this Report – they reflect investment commitments rather than actual funds changing hands – but are nonetheless good indicators of how the market is developing.

5. See p7 for definition

Investments by size band

As has been pointed out in previous reports, the overall totals are highly affected by the number of high value deals, of £2 million or more. These are relatively few in number, and because they are often one-off investments by VCs which do not regularly invest in Scotland, they follow no discernible trend or pattern, and should not be taken by themselves as an indicator of how the market is developing.

Both the upper and lower ends of the investment spectrum can give misleading impressions, and the previous Risk Capital Market report (for 2008) divided the overall totals into three bands:

- **High value deals of £2m or more**
- **Small value deals below £100,000**
- **Middle value →£100,000 and ←£2m**

The middle band includes over two thirds of the deals and is considered to be the most representative when examining long-term trends. We have followed the same approach, and the following chart and table show the figures from the previous report, extended to cover the present 2009-2011 survey.

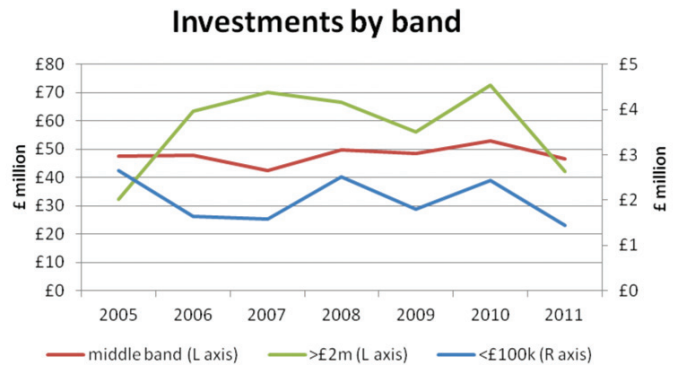


Figure 2: Investments by size band (£m)

	£100k		middle band		£2m	
	#	£m	#	£m	#	£m
2005	57	£2.66	106	£47.54	8	£32.18
2006	44	£1.64	97	£47.89	9	£63.49
2007	31	£1.58	96	£42.30	17	£70.20
2008	54	£2.51	117	£49.71	14	£66.54
2009	41	£1.80	114	£48.34	11	£55.93
2010	56	£2.43	130	£52.73	15	£72.63
2011	31	£1.45	99	£46.59	10	£41.93

Table 1: Numbers and amounts of investment, by year

Looking at the investments divided into bands in this way, it becomes apparent that while 2010 had the highest overall total for six years, and all bands were down in 2011 from the previous year, the middle band (typically the domain of Scotland's business angel syndicates) held up very well over the past three years.

High value investments

Most of the year to year fluctuations in the overall level of investment are accounted for by the variability of deals over £2m. With only 8 to 17 deals over £2m annually, the overall level of risk capital investment continues to be susceptible to variations in a small number of projects.

The top ten of the 36 investments over £2m in the period covered by this report are shown below.

Company	region	sector	new/ follow on	deal date	age years	TOTAL £millions
Amor Group	West	enabling technologies	new	May-09	0.7	£21.8
Electro-flow Controls	Aberdeen	energy	follow-on	Dec-09	21.9	£6.0
BiFab	East	renewables	follow-on	Apr-10	9.4	£11.0
TPP Global Development	East	life sciences	new	Apr-10	0.0	£9.6
ClinTec International	West	life sciences	follow-on	Aug-10	13.6	£8.0
Elonics	East	enabling technology	follow-on	Sep-10	6.9	£6.2
Aquamarine Power	East	renewables	follow-on	Nov-10	3.4	£11.0
Aridhia Informatics	East	enabling technologies	follow-on	Jan-11	3.6	£5.0
Aquamarine Power	East	renewables	follow-on	Sep-11	4.2	£7.0
Nucana Biomed	East	life sciences	follow-on	Nov-11	2.0	£6.7

Table 2: Top ten investments 2009-2011

Note: Although MBO/MBI activity is generally omitted from the figures in this series of Reports, the following exceptional investment has been included in the deals list, in respect of the investment allocated to growth: Amor Group was formed in May 2009 to acquire the Real Time and Pragma businesses from Sword Group. The investment was made by Growth Capital Partners and the Scottish Venture Fund, with debt funding from Clydesdale Bank.

Low value investments

At the other end of the scale are the small deals, below £100k. These affect the overall totals in a diametrically opposite way from the large deals; it is difficult to be confident that all deals of this size have been identified (indeed, it is highly probable that several deals by individual business angels are missing from these totals), but their relatively low value distorts the average per deal.

Some angel groups tend to report deals in a number of separate small tranches, and the figures from Scottish Enterprise's Scottish Investment Bank (SIB) usually follow the same pattern, whereas other investors are more likely to roll up two or three disbursements within a few months of each other into a single deal. This was particularly pronounced in 2010. While we have amalgamated separate records when comparing deals from angel syndicates with records from SIB (in cases when one or the other reported a single deal), we have otherwise not attempted to group these small rounds together. This does however mean that analysis by number of deals can imply a higher level of activity (at the lower end of the scale) than might be anticipated, and for that reason we have in the main analysed results by the amounts invested, which are not subject to the same possible distortion.

Middle value investments

A couple of examples can serve to illustrate the different characteristics of the middle and higher value bands.

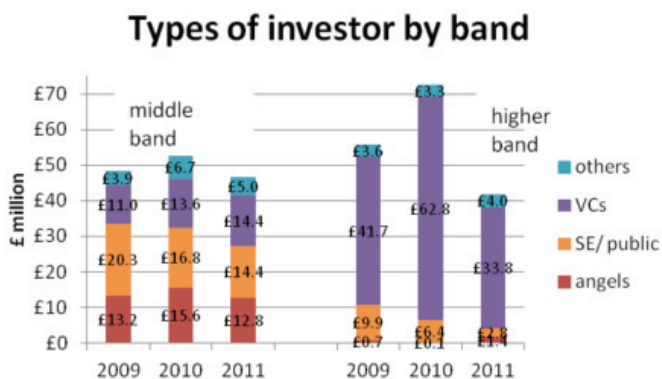


Figure 3: Types of investor by band (£m)

The contrasting role of angels and VCs in the middle band and higher band respectively is very clear, as is the relative importance of public sector co-investment. Figure 3 is presented to demonstrate this contrasting role while including actual levels of investment to complete the picture.

The category 'others' in this chart and elsewhere refers to individual investors who are not part of an angel group (and are not 'founders, family, or friends'), but also includes investors whose identity we have been unable to determine.

The 'SE/public' category includes investments by the Scottish Investment Bank funds - Scottish Seed Fund (SSF); Scottish Co-investment Fund (SCF); and Scottish Venture Fund (SVF) - plus some small equity investment by Highlands and Islands Enterprise.

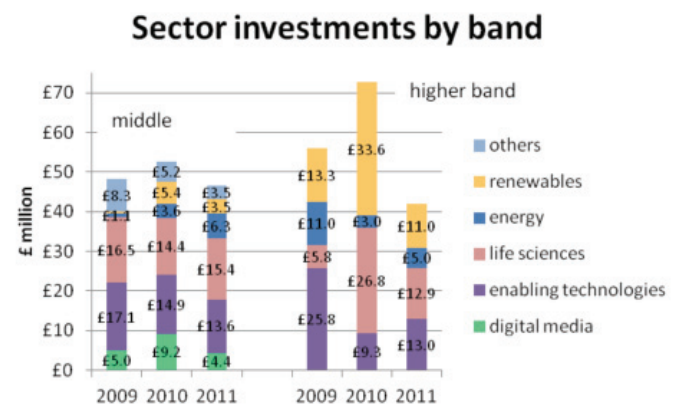


Figure 4: Sector investment by size band (£m)

The renewables sector is dominated by large investments over £2m; life sciences is a much more diverse category, and can be seen to have attracted steady levels of investment in the 'middle' band, with large investments varying substantially from year to year.

Sectors

The investment figures for 2009-2011 confirm the emergence of life sciences and renewables as major recipients of early stage risk funding, impacting on the long held dominance of enabling technologies. While enabling technologies continues to lead sector investment with 31% of the total in this period, life sciences closely follows at 29% with renewables clear in third place at 21%.

These three sectors, discussed in more detail below, accounted for 80% of total investment in the period 2009 to 2011. The growth in renewables can be attributed to VC investment which accounts for 80% of the total. Enabling technologies' VC investment accounts for 55% of the sector's total investment, followed by 41% VC support for life sciences.

There is a strong match with the growth sectors set out in The Scottish Government Economic Strategy and supported by Scottish Enterprise. The Strategy identifies certain sectors that offer particular opportunities for growth - in all or part of that sector - due to existing comparative advantages or through the potential to capitalise on Scotland's assets. These are sectors where Scotland typically has distinctive capabilities and businesses with the potential to be internationally successful.

Figures 6 and 7 demonstrate the differing sector interests of angels and VCs, which often relates to size of deal. As a generality, angels tend to invest smaller amounts than VCs and at an earlier stage of a company's development. It can be said that angels are unlikely to invest where the demand for cash to achieve a successful liquidity event exceeds their available resources and appetite for investment. It thus follows that the renewables sector is the domain of VCs, and this holds largely true as well for traditional energy. Life sciences covers a wide range of different activities, from drug discovery, through medical devices, to contract research organisations (CROs), each of which has different times to market and different funding needs. Several of Scotland's angel syndicates have a specific interest in life sciences and medtech, and continue to invest substantially in this sector.

The following observations are based on the data compiled during this research.

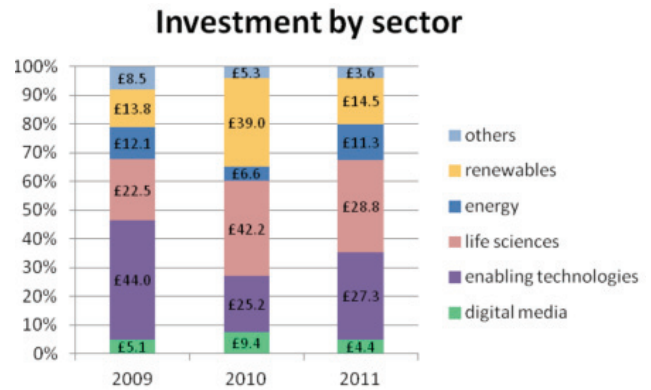


Figure 5: Investment by sector (% , £m)

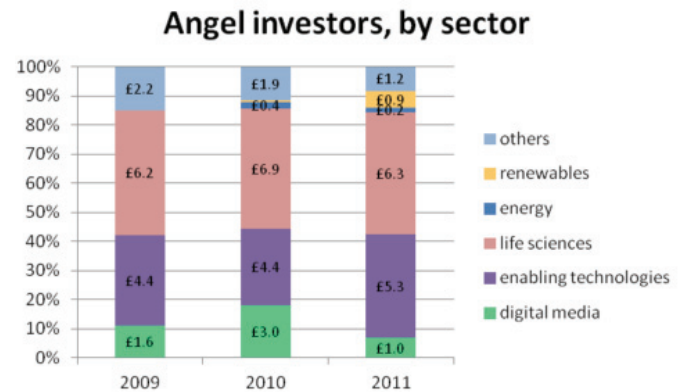


Figure 6: Angel investment by sector (% , £m)

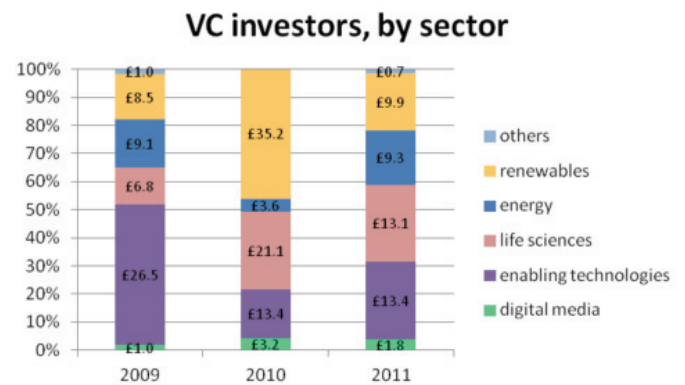



Figure 7: VC investment by sector (% , £m)




Energy and renewables

As far as early stage risk capital is concerned, the traditional energy market is characterised by investments in companies supplying to the oil & gas industry, often providing a service based on proprietary products, such as downhole tools, or pipeline maintenance. This continues to be the case, and this survey tracked a number of these, including a couple which have made sufficient progress to attract significant growth capital over £2m. There is an overlap between traditional energy and renewables – for example, companies with energy saving products, one of which is included in the energy category here.

The renewables sector in this report is dominated by companies with wind, wave, or tidal energy converters, which need very substantial investment to reach validation and adoption. These companies have received VC investment, partly following a fashion amongst VCs to invest in a new and very prospective sector. This has changed a little recently as investors have become cautious about ventures which depend upon government-imposed pricing or subsidies to succeed, which can change at any time. Many angel groups would like to be involved in a sector which clearly still has massive potential, and are looking for smaller scale energy converting systems, or components of complete systems, or other 'green' technologies including smart grids which can benefit from the expansion of the sector without requiring massive investment – all of these types of company are included in the figures in this report.

Life sciences

As remarked earlier, this sector covers a very wide range of different types of company, from drug discovery (and technologies for accelerating and improving this process), to medical devices, to service organisations such as bioinformatics companies and CROs, and encompassing animal as well as human health; each of these subsectors can require different levels of funding at different times during their development. Examples of all of these secured funding in the period covered by this report. Although there was VC investment in this sector, it is not as prevalent as one might expect or hope; on the other hand, angel groups have been able to raise much higher investments for companies in this sector. From all appearances, it looks as though the sector could benefit from some further niche development, for example drug discovery and related companies seeking to convince specialist overseas investors that Scotland has critical mass in this area. The trend in recent years has been in the opposite direction, with medical devices and CROs subsumed into the generic life sciences category; this is no doubt valuable in demonstrating the scale and scope of the sector in Scotland, but in terms of business development it is possible that some further differentiation might be helpful.



Enabling technologies

The previous report for 2008 used definitions from Scottish Enterprise which divided the DMET (digital media and enabling technologies) sector into seven categories, each subdivided into up to 15 sub categories. DMET has now been split into two main sectors: enabling technologies (ET) which was always by far the main component, and digital media (DM).

ET and ICT (combined here) is now defined to cover electronics, engineering, materials, and computing and software – principally cross-cutting technologies in this space, such as companies which are developing technology capability.

In previous years ET dominated the early stage investment figures. It still leads in terms of overall investment, but has declined as renewable and life sciences take a greater share. This is partly due to structural changes which cannot be fully examined here. For example, “over the last five years web (and the diversity of digital technologies that accompany it) have matured, which has, among other things succeeded in bringing down the cost (and amount of capital needed) to launch a viable business” (StartUp Genome, in TechCrunch 10 April 2012).

One investor commented “the one [sector] I have seen fall off is IT and software because these sectors have moved to the west coast of the USA and are now ‘below critical mass’ in Scotland”. This is maybe an extreme view, as there are still clearly many propositions attracting investors to Scottish companies. Of the companies included in this report, it might be significant that a couple of the more successful businesses have joint operations in the UK and the USA.

Digital media

Digital media is defined as games, publishing, broadcasting, and in general ‘creative digital’ to include mobile apps, social networking website development – content, platform and technology providers, developing and distributing innovative digital content and technologies to global markets.

Despite much innovative activity, with projects such as Abertay University’s Dare to be Digital competition expanding its international reputation, and Informatic Ventures’ Engage Invest Exploit (EIE) events, Scotland has as yet not been able to produce a major global company in this sector. Some companies have adapted by developing a niche market, but there is a distinct feel of more important developments happening elsewhere. It is acknowledged that many of Scotland’s angel investors (with a couple of notable exceptions) are of a different generation from the developers of mobile apps and digital games, which may make it difficult for them to assess the potential of a new venture in this field.

Paradoxically, in a world where the internet is supposed to have removed geographical barriers, digital media companies tend to thrive in clusters; the StartUp Genome project referred to above estimates that the Silicon Valley eco-system for start-ups is three times bigger than New York’s, and 4.5 times bigger than London’s (London being the only UK hub in the top 25). The number of companies applying for funding should not be underestimated, and very few succeed, but on the other hand according to figures from investors such as Index Ventures and DFJ Esprit, the few companies that are successful in raising funds tend to secure much larger amounts in these hub locations.

Participants in the Early Stage Risk Market

This section of the report describes the market participants, identifying both the suppliers of risk capital and the different categories of company recipients.

Types of investor

In the previous report in this series, for the year 2008, it was remarked “Under current market conditions, a continual flow of new investors will be needed to maintain the capacity to invest in high-growth potential start-up and early stage ventures”.

LINC Scotland has been successful in facilitating and supporting the development of new angel syndicates in particular, and the capacity for learning and the transfer of knowledge and experience from established to new investors, which has been a major factor in the continuation of investments in the ‘middle band’ at a steady level.

Likewise, the Scottish Investment Bank is charged with encouraging VCs from outside Scotland to partner with one of the co-investment funds (SCF or SVF). These two funds have signed up 14 and 21 new partners respectively in the years covered by this report, most of which have made investments, and again this has helped bolster investment in difficult times.

There is, however, no guarantee that this situation will continue, and widening and deepening the pool of investors remains a significant long-term objective for the market. This is not only needed to maintain levels of investment at current levels, but also to introduce new investors with different priorities and criteria, to help as wide a range of companies as possible to secure funding.

The amount of investment made by each investor type can be shown as a percentage of the overall total investment (the ‘others’ category includes private individual investors, and those for whom we have insufficient information). This reflects the substantial differences between angel and VC investors, with VCs accounting for over half of all investment, but in relatively few deals, and angels a consistent presence, with many more deals of lower value.

Investment by investor type
as %age of total investment

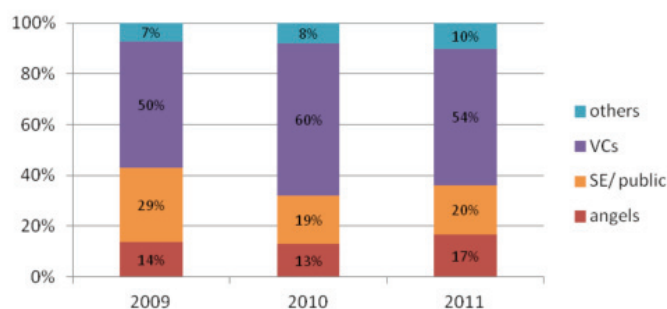


Figure 8: Total investment by investor type (%)

Generally VCs and angels keep apart, for a number of reasons, and the two types of investor are appropriate for different funding propositions, as explained in more detail below. Although angels and VCs do sometimes invest together, this is rare at present, as shown by the following chart:

Investments by angels and VCs



Figure 9: Investments by angels and VCs (£m)

In most cases of co-investment by angels and VCs covered by this report, either the angels are individuals, not investing as part of an established group, or the VC is a specialist institutional investor rather than a generalist VC firm.

The background to this separation of VCs and angels is explained in Professor Colin Mason’s comments in the section ‘Implications for Scotland’, below. In practical terms, as the market presently stands, companies seeking investment should regard VCs and angels as two separate groups, and approach whichever is appropriate to their own growth potential and stage of development, bearing in mind that all independent equity investors are looking for returns of 10x their investment, and that most VC firms have a minimum investment level of £5 million or more, focusing on companies which have some proof of market engagement.

Business angels

In compiling data for this survey, a total of 32 angel groups were tracked (see Appendix 4 for the list). 27 of these groups made investments during the period. The list includes a number of small groups of just two or three investors, which appear to act in the same way as larger groups, in that they invest in the name of the group, and intend to invest in a portfolio of businesses. It also includes two groups, Braveheart Investments and Par Equity, which have both angel and institutional investment arms, but are members of LINC Scotland, the Scottish angel capital association, and are included here for the sake of consistency with previous reports.

When the Scottish Co-Investment Fund was launched in 2003, there were only two established angel syndicates and four relatively new syndicates. As a result of SIB targeted support to LINC Scotland and the ERDF funded Angel Capital Programme, ten new angel syndicates have been created since 2008, resulting in a current total of 19 syndicates joining LINC to invest in Scottish growth companies (with a further two or three in discussions about joining the association).

The 19 angel groups which are members of LINC Scotland are the most active investors in the list, building portfolios of companies and making regular investments. This is demonstrated in the following chart, which shows how many groups made investments at each level.

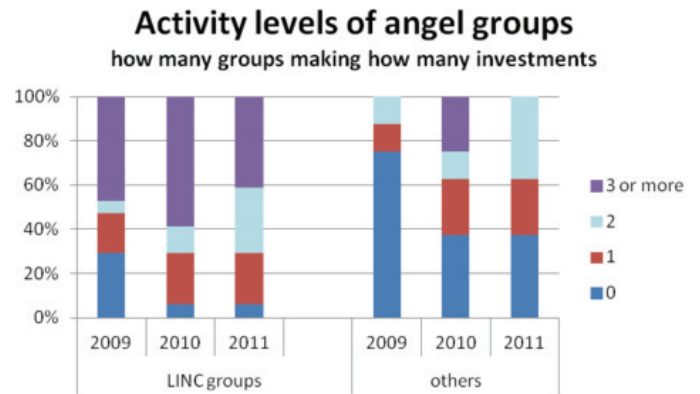


Figure 10: Activity levels of angel groups

We have not been able to establish starting dates for all angel groups, and the relatively high level of groups making zero investments in 2009 could be explained by some of them not being fully formed at that date.

The pattern of angel investment, in terms of sector preferences, has already been depicted in Figure 6. It is also revealing to examine the extent to which angel groups invest close to home or further away.

Although by far the strongest correlation is between investors in the East of Scotland and companies in the same region, the figures show that angel groups are prepared to invest fairly widely across the country. In particular, companies in both the East of Scotland and the West have secured investment from angels in all other regions.

In Scotland, the majority of business angels are high net worth (HNW) individuals, whose wealth derives from other sources than the markets in which their investee companies operate. Elsewhere in the world the most active angels are often 'cashed out' entrepreneurs, who can see market opportunities and know how to exploit them. This has a number of implications, such as the frustration of young companies who expect local business angels to understand their markets, and the practice of some VCs to invite individual angels (but not syndicates) to co-invest with them for the sake of their market expertise.

£'000		investee location					
investor location	Aberdeen	East	Highlands & Islands	South	Tayside	West	
	East		£14,625			£3,677	£4,051
	West	£613	£1,616		£33	£1,059	£1,790
	South	£39	£2,657		£401	£165	£2,169
	Tayside	£330	£2,571			£717	£1,311
	Aberdeen	£1,425	£110				£620
	Highlands & Islands		£547	£493	£56		£262
	other UK		£1,897			£2,530	£50
	outside UK		£50				£200

Table 3: Regional distribution of angel investments

One participant in the consultation interviews felt that this meant the current levels of angel investment should not be taken for granted: “the bulk of it [risk capital] is coming from business angels who in a sense are volunteer investors – they don’t need to do this.” This interviewee was concerned at “the extent to which we rely on wealthy retired people who are doing it out of good will”. Many of these investors are influenced by the EIS tax regime, which gives income tax relief and capital gains tax exemption on investments in young companies, thus considerably reducing the risk. The EIS scheme is restricted to investments in the ordinary shares of a company, which puts members of angel syndicates in a different position from VCs, which invest in preference shares.

The syndicates are not generally concerned about levels of membership; most have some small turnover, with leavers currently balanced (or even outnumbered) by new joiners. “We are getting new members, we have a steady trickle and we are gaining more members than we lose.” It is also generally felt that “there is a huge scope for new members in Scotland”. Many of the syndicates prefer to remain relatively small and flexible, and although the syndicates can and do co-invest when larger deals are required, this is sometimes seen as slowing down the investment process (particularly in follow-on rounds), and there is often a preference for investing alone. This observation is related to the feeling that more groups

would be a benefit to the market, giving a wider range of investment preferences for which companies might be suitable, and increasing the number of investors: “more people would get involved in the early stage risk capital market if there were more syndicates, and particularly more local syndicates”.

Largely in response to the difficulty of securing bank finance, even for working capital for companies with revenue, some investors have made loans to portfolio companies: “We have been doing a lot of convertible loan notes over the last year many of which would under easier circumstances have been provided by a bank”. This has become a regular although relatively minor part of the funding picture, amounting to over £6 million in the three years covered by this report (approximately £1.7m in 2009, £1.5m in 2010, and £2.9m in 2011). There is however no indication that this is becoming part of a planned finance structure for a business, but rather a stop-gap when for example an investee has a product ready for a new market and needs working capital before it can make new sales. Business angels cannot claim EIS relief on such loans, but on the other hand, they represent a way of earning some money from the investment (assuming the interest rate is attractive) sooner than waiting for the equity investment to mature.

Venture capital firms and institutional investors

In this report, the category VC includes, besides the venture capital firms investing from independent funds, other institutional investors such as large corporations and corporate venture funds. 80 different investors have been tracked in this category, of which 56 are known to have made investments in Scottish companies during the period covered by the survey (see Appendix 4), and 19 have confirmed that, while active elsewhere, they did not make any investments in Scotland.

The survey has identified 11 such firms within Scotland, 24 elsewhere in the UK, and 21 overseas. Of these, 12 were interviewed during the consultation process (listed in the Acknowledgments section). A common view was: “The chances that there are good businesses that are being rejected are slim”, but also that “demand always outstrips supply in this market – always has done, always will do”. To some extent these comments can be regarded as partisan, disregarding the many promising companies which fail to secure funding, but it should also be noted that two investors, active across the UK, indicated that the quality of the deal flow from Scotland has fallen back a bit in comparison with the rest of the UK and indeed Europe. There is some evidence that companies in Scotland are not fully aware of the competition they face when looking for VC investment, and that companies which have suitably large growth prospects must not only make themselves known to a range of possible investors outwith Scotland but must also have a clear understanding of how their businesses compare with others from elsewhere in the UK or Europe which are approaching the same firms.

Activity levels of VCs & institutions

location of funds making number of investments

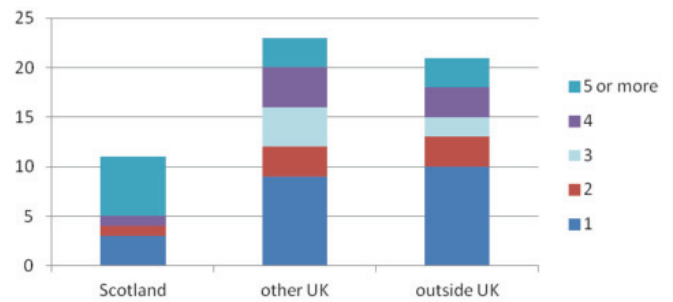


Figure 11: Activity levels of VCs and institutions

There is a marked difference between the number of firms making a single investment, and those making 5 or more, between institutions based in Scotland and those outside. The chart shows the number of deals made rather than the number of companies invested in; the detailed list of deals confirms that many of the investors from outside Scotland make only sporadic investments, not generally choosing to invest in several companies in a sector (although one European based VC is bucking this trend, and there are hopes that a large VC in the Far East will do the same).

VC investment in sectors, by origin

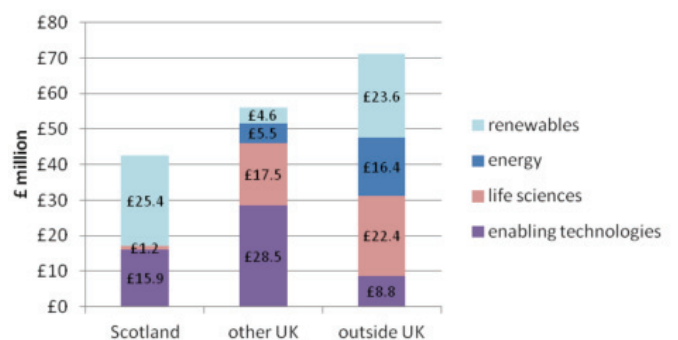


Figure 12: VC investment in sectors, by origin (£m)

There are no surprises in this breakdown, which confirms the observations in the Sectors section above, namely that VCs from outside Scotland have brought their investment power in particular to the energy/renewables and life sciences sectors.

When narrowing the focus to just the larger deals, we find that VCs based in Scotland (see Appendix 4) put 45% of their investment in deals over £2 million, compared with 64% for those VCs based elsewhere in the UK, and 71% for those based outside the UK. This implies that VCs from further away prefer to concentrate on the larger deals available with Scottish companies, and that Scottish companies need to compete on an international scale. This in turn could suggest that there is an issue with the pipeline of propositions from Scottish companies and their effective promotion to relevant VCs.

In this regard, reputation for the quality of deal flow, product and process innovation, and of the underlying science base is considered crucial. It is also fundamental to understand that VCs will only be attracted by the possibility of generating high returns on investment - higher returns than other opportunities which they have at any one time elsewhere. As a rule of thumb, VCs target a return of 10x their investment; as pointed out in the Overview section above, in the UK and Ireland, 50% of technology exits are for under £25 million, so it follows that VCs have to narrow their focus to only those businesses with truly exceptional growth prospects.

Interviews with London based VCs suggest that there is a need for more active marketing of Scottish companies to VCs. There are few VCs successfully active in the early stage market (ie true 'venture' capitalists), but those that there are indicate a desire to meet with companies before the time that they might be negotiating a deal with them.

VC investments by location of investees

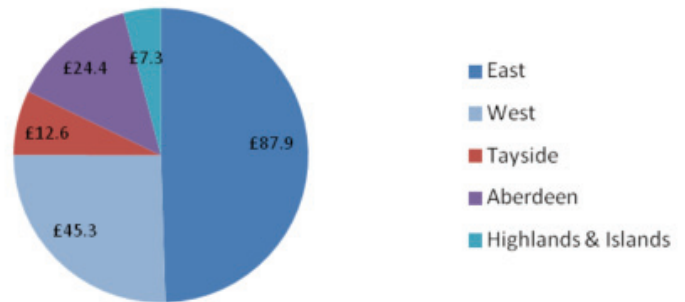


Figure 13: VC investments (£m), by location of investees 2009-2011

Public sector

The public sector investments included in the deals listing for this report are almost entirely from the Scottish Investment Bank funds - Scottish Seed Fund (SSF); Scottish Co-investment Fund (SCF); and Scottish Venture Fund (SVF) - plus some small equity investment by Highlands and Islands Enterprise.

As indicated by the consultation interviews (see below), under existing market conditions the importance of the SIB funds in this sector is related to the issue of exits. It is widely accepted that the Funds are valuable in increasing market liquidity, helping spread risk, increasing deal levels, extending the survival rates, and ultimately improving company growth prospects, and that the angel sector, which provides the constant 'middle' sector investments illustrated in this report, would not have been able to develop as it has without the partnership with the Scottish Co-investment Fund. With the market having 'straight-lined' over the past few years, the SIB Funds can be seen to have played a major part in alleviating an equity gap, and similar support will be required for the immediate future to support activity at similar levels. The early stage risk capital market remains fragmented, with evidence that not all companies can access the finance they need for growth. While this persists, Scotland will not perform as well as it could.

There is little doubt that activity would decline in the all-important 'middle band' without SIB co-investment; a view confirmed by market consultations with business angels and VCs. The higher band of investment is less dependent upon this co-investment (see charts below), but as mentioned elsewhere in this report, this band is characterised by intermittent one-off investments.

There is possible merit in considering the adaptation of funds to the different segmented markets which are appearing. To some extent the SVF recognises this, focusing on the level of investment, but with a need for interventions to focus increasingly on market sectors. For sectors such as life sciences and renewables it is possible that dedicated funds could more easily make connections with specialist investors. In addition, and in parallel, more specialist work needs to be done with companies to help

SIB co-investment with angel groups middle band only



Figure 14: SIB co-investment with angel groups (% , £m)

SIB co-investment with VCs middle and higher bands

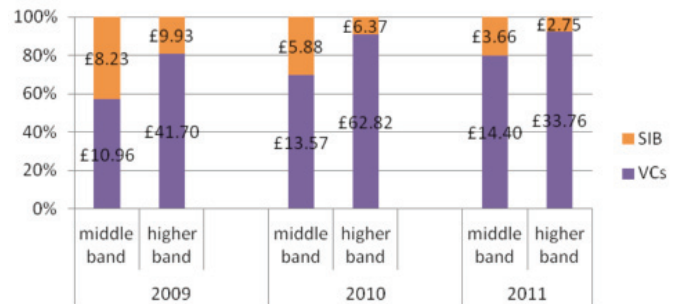


Figure 15: SIB co-investment with VCs (% , £m)

Angel groups are largely active in the middle band, and make considerable use of co-investment facilities from SIB funds. Many large VC investments are made by firms without co-investment partnerships with SIB, and particularly in the higher range SIB funds play less of a market driving role.

Companies

Several characteristics of the investees in this survey have already been analysed above. Here, we examine some further aspects of this group.

Age

The amount invested in early stage companies has deflected very much in favour of older companies, at the expense of start-ups, in the past three years. As elsewhere, these figures are heavily influenced by the pattern of large investments over £2m, but these affect mainly the totals for the older established companies (on the basis that VC investors do not often fund companies which are still pre-revenue). The increase in funding for older companies is to some extent explained by the build-up of portfolios and follow-on investments, given the lack of exits for investors.

Age of company at date of investment



Figure 16: Age of company at date of investment (£m)

Location

Investment is heavily concentrated in companies in the East of Scotland. Although energy investments are still predominantly into Aberdeen-based businesses, the flow of funds to renewables companies accentuates the predominance of the East region.

£'000	Aberdeen	East	Highlands & Islands	South	Tayside	West
enabling technologies	£323	£54,968	£0	£0	£2,042	£39,153
digital media	£0	£6,636	£0	£0	£5,740	£6,554
life science	£4,938	£39,219	£5,660	£575	£18,602	£24,485
energy	£25,064	£0	£0	£3,491	£1,093	£300
renewables	£4,242	£50,967	£5,505	£0	£2,900	£4,159
others	£150	£7,073	£938	£233	£5,790	£3,486
Totals	£34,717	£158,862	£11,648	£4,298	£36,167	£78,137

Table 4: Regional investment by sector

Investment in the West has fallen sharply in 2011 (see Figure 17 below), but the figures are affected by large investments over £2 million, amounting to £21.8m in 2009, £11.1m in 2010, and £3m in 2011. This leaves an underlying pattern of £16.3m/£16.8m/£12.2m, still a decline in 2011 but less drastic than the chart implies. Figure 18 shows the geographical distribution of investments in the middle band only, and shows a similar pattern to Figure 17. This regional disparity is long-standing, and appears to be widening. It has been shown above that angel groups from every region in Scotland are prepared to invest in companies based in the West, and it is possible that the issue is one of lack of demand.

While investment naturally flows to opportunities, and experience with EU funded regionally based investment funds have not been conspicuously successful, stimulating demand from growth orientated ventures located in the West remains a major challenge. More information is required for a full understanding of this situation. For example, it might be helpful to compare the East and West of Scotland in terms of the age, size, and stages of development of all companies, to determine whether the imbalance of funding is perceived by companies in the West as a major problem or whether there is indeed a lack of demand, and what stops potential angel investors in the West from entering this market.

Investment by location of investee



Figure 17: Investment by location of investee (% , £m)

Middle band investment by investee location



Figure 18: Middle band investment by location of investee (£m)

This is a chiefly a deal quality/business development issue, and is a microcosm of the overall UK position and so to some extent is expected. Given the sector-related investment dominance of life sciences and renewables (and to an extent, oil and gas) as well as suppliers to these sectors covered by enabling technologies, it is perhaps more a factor of sector location preferences rather than investment decisions alone.

University spinouts

Scotland's universities have been active in spinning out new companies over the past decade – more active in this respect than most universities elsewhere in the UK. These companies form a particular class of investee, and merit specific analysis.

A recent report published by YCF⁶ showed that the Universities of Edinburgh and of Strathclyde were 3rd and 7th respectively in the top ten universities in the UK for the number of spinout companies created in the ten year period from 2000 to 2010. More recently (focusing on just the last three years) Edinburgh ranked first, with Strathclyde moving up to 5th place, and Aberdeen (7th) and Heriot Watt (8th) entering the top ten.

More spinouts have secured investment over the past three years, but the total investment has declined substantially, indicating a lower average; however, in the previous Risk Capital Market report for 2008 it was pointed out that in 2005 a little over £18m of the total was invested in just three companies.

There is some concern however that Scottish universities secure significantly less at each round than their UK counterparts. For example the PraxisUnico Spinouts UK survey has tracked over 40 investments in life sciences spinouts in 2011 and 2012, which show average values of £6.3 million in 2011 and £3.5 million in 2012, heavily influenced by investments as much as £60 million in 2011 (Circassia) and £22 million in 2012 (PsiOxus Therapeutics). Over this 18 month period, 11 of the 46 deals were for over £5 million, a level reached only three times by Scottish life sciences companies (none of which was a university spinout) in the three years covered by this report. In corroboration of this finding, recent research by Scottish Enterprise has found that life sciences companies are relying on investment by Scottish angel groups and are either not actively seeking or are failing to secure VC investment. As discussed earlier, life sciences' sub-sectors often have different levels of financial requirements at different periods within their development. In general, angel investment is more pre-disposed to a sub sector like medical devices whereas VC investment is likely to be more appropriate to drug discovery where greater amounts of capital are required and over a longer timeframe.

Investments in Scottish university spinouts



Figure 19: Investments in Scottish university spinouts (#, £m)

In the three years from 2009 to 2011 there were five investment deals over £2 million, and this lower proportion of high value deals is reflected in the changes in proportion of amounts invested and number of deals, when compared with the totals for the same period, as shown in the following chart. This implies that in aggregate university spinouts secure investment at lower average values than other early stage companies; this is an observation that would merit further investigation.

Scottish spinouts as % of all investments

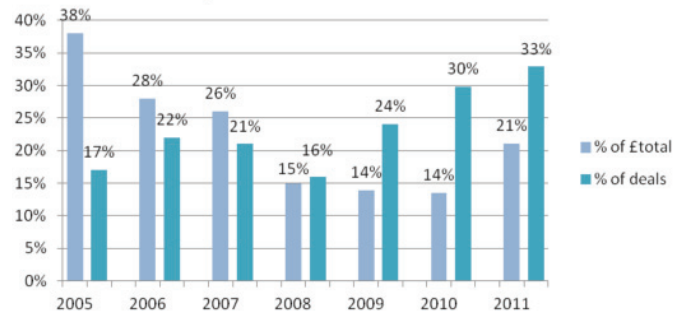


Figure 20: Investments in Scottish university spinouts (% of total)

The pattern of investment mirrored the number of spinouts created, with spinouts from Edinburgh securing £19.0m over the three years covered by this report, in 52 investment deals, followed by spinouts from Strathclyde (£9.3m in 32 deals), Heriot Watt (£5.7m in 17 deals), and Aberdeen (£4.2m in 16 deals).

6. The PraxisUnico Spinouts UK Annual Report 2012, Young Company Finance, www.spinoutsuk.co.uk

Equity gaps

Commentators on the early stage investment sector have often pointed to the presence of 'equity gaps', between investments at one value level and the next. It is regularly reported that the existence of these gaps makes it harder for companies to attract an appropriate level of funding at different stages of their growth, as for example at start-up, or between initial funding levels and those needed for accelerated growth. However, the levels at which such equity gaps are identified tends to change from time to time, and there can be much disagreement over whether or not a gap exists at a given funding level, and if so whether or not it is a significant barrier to company development.

In his commentary (Implications for Scotland, below), Professor Colin Mason makes the point that the amount of investment required to take a company to profitability has not greatly changed, but that the timing at which different parts of this investment are needed has evolved. His analysis suggests that traditional investors (such as VCs) are moving away from start-up and seed stage deals, partly because it now takes less money to start and validate a company than before, and investment at these levels is uneconomic for them. Instead, new categories of investor – crowd funders, super-angels, incubators – are entering the market.

In Scotland, it is commonly perceived by young companies and their advisers that investors are wholly committed to supporting their portfolio companies and have few if any resources left for investing in start-ups. The picture which emerges from the 2009-2011 data is not quite so clear cut. For their part, the angel groups are explicitly keen to invest in new companies - they need to if they are to maintain balanced portfolios - but have not all been able to do so as much they would wish, given the demand for follow on funding by their existing portfolio companies.

The latest figures (2011) show that investments under £100k were at their lowest level for seven years, in both number (31) and amount invested (£1.45m), which is a strong suggestion of an equity gap at this level, not yet covered by the new forms of funding which are springing up.

Although it is virtually impossible to track all investments at this level, the methodology of the survey has been consistent over this period, meaning that the figures are broadly comparable year by year.

Some caution is however needed before declaring that an equity gap exists at this level, as there is also evidence of lack of demand, with comments from both SIB's Scottish Seed Fund (SSF) and from banks indicating that although they are keen to support companies at an early stage, there have been too few qualifying proposals to use the funding available. Companies which need funding are either unable to meet the qualifying criteria, or have been deterred from applying in the first case. The qualifying criteria include securing matching funding for an SSF investment – more difficult to do in the current economic climate – or, for a bank loan, to show evidence of revenue, and/or assets available as security, neither of which can be easily done by a start-up company. Securing finance from either source – SSF or bank loans – is perceived as a lengthy and bureaucratic process, and many companies in need of funds balance their view of the chance of success against the time and effort involved. The market will need to be persuaded that these perceptions are mistaken (if indeed they are), with evidence from early stage companies which have succeeded in securing finance and can convince others in similar circumstances.

Investments at all levels break down into 'new' (or first-time) and follow-on rounds, as shown in the following charts, which confirm a distinct drop in the proportion of first time investments particularly in 2011. Start ups are a particular category of new or first time investments and are discussed below.

Nonetheless a significant number of young companies did secure investment: the last three years have witnessed 103 companies receiving investment for the first time (2009:32, 2010:44, and 2011:27).

Focusing on the middle band, approximately one quarter of all investments has been into companies seeking equity for the first time with three quarters into follow-on, for any single year; this proportion has declined to below 20% in 2011.

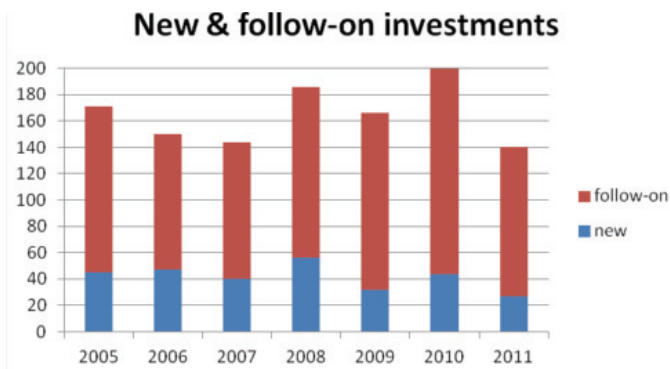


Figure 21: New (first time) and follow-on investments (by number)

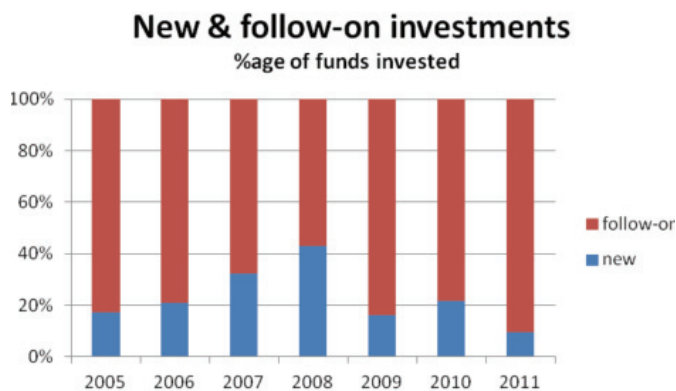


Figure 22: New (first time) and follow-on investments (%)

Not all the 'new' investments in the above charts were start-up companies; if we designate as start-ups those companies which received their first external investment within two years of incorporation, we can differentiate between these and older companies, which in former times might have been able to secure bank funding.

As a proportion of first-time investment alone, investments in start-ups remained relatively constant over the past three years. The middle band, which we are taking to be the most representative of the sector, shows a reasonably consistent division of first time investments, by number and by value - approximately 40% into older companies, and 60% into start-ups. In other words, the amount of investment has certainly declined, but the proportion of total investment in start-ups has remained much the same, indicating that the problem is less one of

discrimination by investors in favour of older companies, and more one of a general decrease in funding.

The challenge for increasing the amount of funding into start-ups is not as simple as just increasing the supply of funds, or at least not at this stage. From the responses to the consultation interviews, and from the experience of the SSF, it is apparent that although funds are certainly limited (meaning that investors are more selective), there is some lack of quality in the investment propositions. Investors, especially angel groups, are now reporting deal quality as a constraint more so than a couple of years ago. This suggests that more companies would get investment if they had better propositions for investors. If an approach to address this started to succeed, the amount of funding available would however need to be increased.

There is a learning curve for investors as well as for young companies, and it is clear that, partly prompted by difficult market conditions, they have subjected their investment decisions to much more scrutiny. This self-examination has led them to tighten their investment criteria, maybe by being more strict about definitions of qualifying sectors, more searching in their analysis of the amount of funding needed to reach profitability, and much clearer on how and when they can make a return on their investment. This does not imply that they are all more risk averse (but some might be) - as mentioned above, investors need to continue making new investments at their chosen level of risk to maintain the balance of their portfolios.

It should be noted that the Government's Seed Enterprise Investment Scheme (SEIS), an extension of the EIS scheme which is a major feature of much angel investing in Scotland, is being introduced to promote more investment at the start-up stage. It is too early to say what effect this might have on the market, but angel investors have generally welcomed this development, which could play a part in helping start-ups to refine and validate their initial business ideas before approaching angel groups for the next stage of funding.

Exits

Exits are 'liquidity events', where investors have the opportunity to realise a return on part or all of their investments. These events can in some cases give the investor the choice of staying invested in the business, or of selling shares. This can happen when a company reaches profitability and the investors can see a return ahead in the form of dividends, or in a flotation, when investors may liquidate part of their shareholding but retain the balance. The term 'exit' is regarded by some people who participated in the consultation interviews as a little unfortunate, as it reflects the situation solely from the investors' point of view, but no suitable alternative has yet been found. However, all independent investors, whether angels, VCs, or institutions, need returns on their investment, and this perspective inevitably takes priority in a discussion of the risk capital market.


Exit opportunities have been severely curtailed since the dot.com boom years, reducing investors' capacity to recycle investment into new ventures. With the Initial Public Offering (flotation) route virtually closed due to lack of investor confidence resulting from economic uncertainty, early stage VCs and business angels have had to look to trade sales for release of value. With few exits in any one year, discernible trends are not apparent.

From data monitoring and analysis by YCF⁷ it appears that trade sales were few and far between during the depth of the recession in 2008-2009, with only one deal in 2008 and one deal in 2009. The situation improved a little with seven deals in 2010 (eight if Gyne Ideas and Mpathy are considered as separate investments) and six deals in 2011. Companies and their investors have had to be patient, with the average age of an investment reaching an exit in 2010 being nine years, extending to ten years in 2011. The trade sales for which we have been able to find data over 2009-2011 are shown below.

Company	exit	age at exit	aquired by
HoundDog Technology	Jul-09	6.1	GFI Software
Reactivlab	Mar-10	2.6	Avacta £5m
BeCogent	Aug-10	11.4	Teleperformance (France) £35m
Red Kite Animations	Sep-10	8.3	August Media (Singapore)
Mobiqa	Oct-10	8.3	NCR Corp
Gyne Ideas	Oct-10	17.6	merged with Mpathy Medical, sold to Coloplast
Mpathy Medical	Oct-10	7.6	Coloplast (Denmark) £22m
Gigle Semiconductors	Nov-10	5.0	Broadcom \$75m
Mclaren Software	Dec-10	10.1	Idox Group
Psymetrix	Feb-11	14.2	Alstom
Lab901	Feb-11	9.3	Agilent Technologies
Essential Viewing Systems	Mar-11	12.1	Digital Barriers plc £4.85m
Calvatec	May-11	3.1	Maxim
Level Four Software	Nov-11	16.6	Clear2Pay (Belgium)
Sight Science	Dec 11/Jan-12	5.1	Vycor Inc for £375k

Table 5: Trade sales of early stage Scottish companies 2009-2011

7. <http://www.ycfscotland.co.uk>



Exits and the liquidity they bring is key; the various supply side measures, notably co-investment, have allowed investors to maintain a level of activity and follow their money, and hence have helped keep investment levels and activity higher than would have otherwise been the case. Views vary on when the market might see more trade sales, but there is a distinct feeling that “the engine has seized up”, and until early stage investors can see a few profitable exits they will not only be short of cash for re-investing, but will also face increasing difficulty in persuading their own investors (individual business angels in syndicates, LLP partners in VC funds) that this asset class is worth considering.

The market is grappling with ways in which more trade sales could be encouraged. One result of this is the increasing tendency of business angel groups to require would-be investees to define how and when they might be able to attract a larger company as an acquirer. This in turn establishes the amount of funding required by the angel syndicate to help the investee get to this point. For entrepreneurs, this means contemplating a second life for their ventures, as part of a larger whole in which they might well be involved personally in a new role (and are likely to be retained for a period while the acquirer absorbs the business it has bought). Such developments can often result in the larger company establishing a global ‘centre of excellence’ in Scotland. One thinks of Voxar/Toshiba, Haptogen/Wyeth, Lab901/Agilent, and Psymetrix/Alstom as examples of how in this ‘second life’ young Scottish companies have become the nucleus of an operation which develops world-standard technology and expertise in Scotland, while usually increasing the number of highly skilled jobs.

It should be noted that VCs have always been clear about the need to achieve exits to enable their clients, typically institutions such as pension funds, insurance companies, and banks, to see returns on investment. In former years, an IPO was the most obvious route, but VCs are currently in the same impasse as business angels, and are looking to trade sales for exits. The differences between the two categories of investor are the stage at which they will invest, and the amount of funding they can provide to take a business to this ‘value inflection’ point. Angel groups have calculated the limits to their overall investment in a company, and are deliberately selecting as investees those companies which can be taken to a trade sale within

these limits, acknowledging that although they would like to see portfolio businesses become ‘companies of scale’, this may not be on their watch, and a planned route to a more modest return is the most effective approach to adopt.

Angels and VCs are quite different groups, and illustrate the ‘fragmentation’ of the sector mentioned elsewhere in this report. Many observers feel that angels should look to VCs for potential exits, but in practice this is rare and is unlikely to happen because of investment preferences. If an angel group presents a portfolio business to a VC with the hope that the VC will be able to invest larger amounts and take the business to the next level, the VC will assess and value the business as it stands, making no allowance for the cost of developing it to this point. Almost inevitably this means that the angel group will be diluted in the ongoing business, or only able to make an exit at a loss. In general when VCs talk about co-investing with business angels, they are referring to known individuals (possibly entrepreneurs from other businesses they have funded), and explicitly exclude angel groups or syndicates, because of the problems involved. Although VCs need businesses to have been developed to a point (probably the early revenue stage) where they can assess the potential against their usual terms of reference, and business angels need to see wider funding horizons for some of their portfolio companies, in practice where these two groups have collaborated successfully it should be noted that these examples are based on a unique set of circumstances not easily replicated but nevertheless should be encouraged when appropriate.

However, there are no easy answers to the problem of accelerating liquidity events for investors, and any response would involve much greater awareness-raising of companies to potential acquirers (which probably involves considerable research of targets). LINC is testing this with firms involved in M&A, but some of these deal in later stage or longer established businesses. It has been suggested that companies are no longer acquired for the potential of their technology, but more for their positioning in the market. This might change, as potential buyers build up larger cash reserves and need to use them to good effect.

International Comparisons

This special feature for this latest report, introduces available investment data from beyond Scotland.

Informal investment – business angels

As far as business angel investing is concerned, Scotland has much better and more 'visible' data than comparable countries, and it is difficult to compare angel investing in Scotland even with the pattern elsewhere in the UK. This is largely because Scotland has led the way in establishing organised syndicates of investors, whereas south of the border most business angels invest alone or in small groups, and the angel networks mainly see their role as matchmaking between entrepreneurs seeking funds and angels willing to invest. The second annual report for BIS on the Business angel market in the United Kingdom: 2009/10⁸, by Professors Colin Mason and Richard Harrison, estimated the total business angel activity for the year as £317.7m, of which £50.5m is attributed to business angels in Scotland in deals totalling £125.8m (using a different basis for reporting than that used in this Report, see p12).

The authors pointed to three differences of note from the previous year:

"First, deal sizes were smaller in 2009/10. Second, LINC Scotland reported more follow-on investments in 2009/10, which is consistent with the anecdotal evidence on difficulties in securing exits, whereas BBAA networks experienced a higher proportion of new investments. Third, the proportion of larger companies (more than 10 employees) raising finance increased, which might be consistent with the lack of bank finance or longer periods of bootstrapping prior to seeking external finance."

They concluded "The health of the angel market remains critical to the vitality of the UK's entrepreneurial economy. Angels have a crucial role to play in the 'private sector-led recovery'."

8. <http://www.bis.gov.uk/assets/biscore/enterprise/docs/a/11-p116-annual-report-business-angel-market-uk-2009-10.pdf>

Venture capital

There is a mass of (often conflicting) data covering venture capital investment globally, but it is difficult to use this for direct comparisons which will give helpful pointers to policy development, for a number of reasons:

1. There are many different definitions of stages of investment (seed, start-up, etc), which obscures what would otherwise be a helpful distinction between venture capital and private equity;
2. The term 'venture capital' is usually used to include 'private equity' investment, which focuses on investing in established companies with revenue, rather than on building new companies from scratch;
3. It is not always clear whether statistics refer to the country in which the investor is based, or the country of the investee companies;
4. Almost no sources of reliable global statistics differentiate between Scotland and the UK as a whole.

One of the main sources for comparison of VC activity on a global basis is the Ernst & Young series 'Global venture capital insights and trends'⁹ - the latest report in 2011 is entitled 'Globalizing venture capital'. The report draws on the Dow Jones VentureSource database, and gives the following comparison for Europe, the US, and the rest of the world.

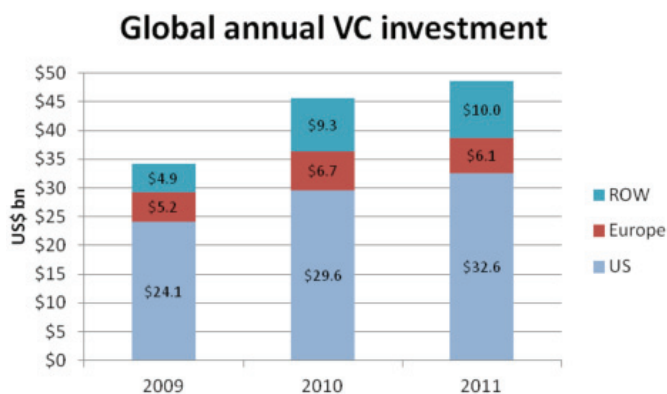


Figure 23: Global annual VC investment

The report comments that US VCs have been able to raise more capital than those based in Europe, which recorded the worst volume since 2004. The authors highlight one particular trend which has implications for young companies in Scotland:

“Currently, the vast majority of VC firms invest just in their own local home markets; however, more will be investing internationally in the near future...Of those VC firms investing outside their home countries, 57% plan to increase this activity during the next five years, while 35% plan to maintain their level of international investment. The distinct global VC trend toward international investment is best illustrated by the example of US firms. Nearly half (49%) of the US VC firms in the survey are currently investing outside of the country. Of all US firms, 42% plan to increase their international activities, 30% plan to maintain the current level, 3% plan a decrease and only 25% have no plans to invest outside the US.”

Figures from the Quarterly Transatlantic Tech Investment Review¹⁰, compiled by international executive search firm Calibre One, focus on technology investments (which removes some of the retail and other sectors favoured by private equity firms), and give a comparison for the UK with North America:

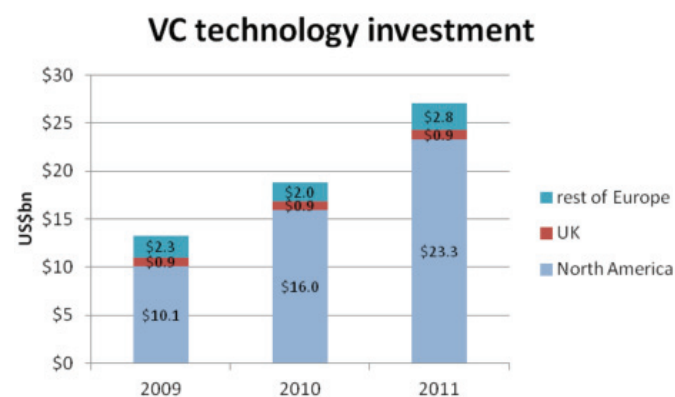


Figure 24: VC technology investment

These figures show the same overall increase in investment through the three years covered by this report, although investment in UK companies stayed static over this period.

9. [www.ey.com/Publication/vwLUAssets/Globalizing_venture_capital_VC_insights_and_trends_report_CY0227/\\$FILE/Globalizing%20venture%20capital_VC%20insights%20and%20trends%20report_CY0227.pdf](http://www.ey.com/Publication/vwLUAssets/Globalizing_venture_capital_VC_insights_and_trends_report_CY0227/$FILE/Globalizing%20venture%20capital_VC%20insights%20and%20trends%20report_CY0227.pdf)
 10. www.calibreone.com/market-information.php

A comparison with other European countries is given by the European Private Equity and Venture Capital Association (EVCA), but here the figures are not restricted to early stage venture investments. The data covers investments by EVCA members, ie firms based in Europe, who made over 97% of their investments in European countries in these three years (pace the comments from Ernst & Young quoted above).

The background to the above analysis is that the VC industry is in a state of flux. In a recent report¹¹, the Kauffman Foundation, which was set up to research and comment upon entrepreneurship, but also invests as a limited liability partner (LLP) in venture capital funds in the USA, commented "Venture capital (VC) has delivered poor returns for more than a decade. VC returns haven't significantly outperformed the public market since the late 1990s, and, since 1997, less cash has been returned to investors than has been invested in VC." In its own portfolio it found that only 20 of 100 venture funds generated returns that beat a public-market equivalent by more than 3% annually, and half of those began investing prior to 1995. The majority of funds—62 out of 100—failed to exceed returns available from the public markets, after fees and carry were paid. Rather than follow the standard interpretation that the VC model itself is broken, the Kauffman Foundation concludes that there is a substantial misalignment between LLPs and fund managers, with LLPs failing to challenge VCs on their performance.

The most important aspect of this analysis from the point of view of young companies in Scotland is the observation: "The typical GP [general partner, ie fund manager] commits only 1% of partner dollars to a new fund while LPs commit 99%. These economics insulate GPs from personal income effects of poor fund returns and encourages them to focus on generating short-term, high IRRs by 'flipping' [disposing of] companies rather than committing to long-term, scale growth of a startup."

These comments relate specifically to the USA, but it is clear that VC firms across the world face some significant challenges. There is a wide gap between the best- and worst-performing VCs; in the USA at least there is some pressure to change the traditional structures; and the implication is that young companies looking for VC investment should research their targets carefully.

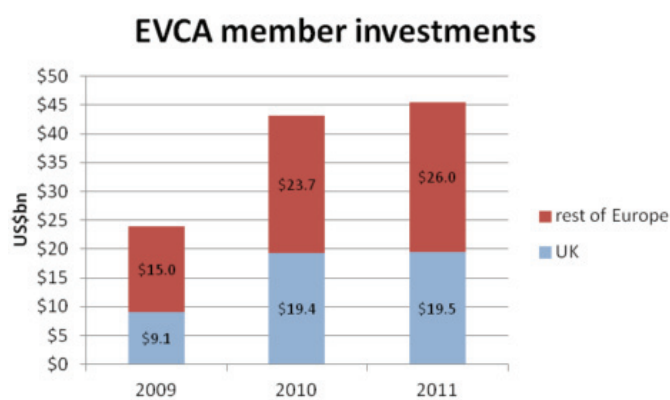


Figure 25: EVCA member investments

11. "We have met the enemy... and he is us", Kauffman Foundation, May 2012

Main Findings

Despite a period of unprecedented economic uncertainty, the Scottish risk capital market has held up relatively well, especially in the deal band size between £100k and £2 million.

Following the impact of the dot.com bubble, investment in Scotland's early stage companies reached a low point in 2005, then recovered and stayed constant, despite the economic downturn, before reaching a six year high point in 2010. The investments tracked by this report show a distinct decline in 2011, but the first few months of 2012 show investment levels at recent norms, indicating that the decline in 2011 was caused more by the timing of large investment deals than evidence of a continuing downward trend.

Most of the year to year fluctuations in the overall level of investment are accounted for by the variability of deals over £2 million. With only 8 to 17 deals over £2 million annually, the overall level of risk capital investment continues to be susceptible to variations in a small number of projects.


The middle band of investments (£100k to £2 million) gives a better picture of how the market is constituted, as it includes over two thirds of the deals. This middle band has held up over the long term, whereas deals below £100k and over £2 million have fluctuated, with disappointing results in 2011.

There has been an increase in follow-on investments in portfolio companies rather than new investments, with over 90% by value of investments in 2011 being follow-on rounds. However, the pattern is variable, and the percentages in 2009 and 2010 were similar to those in 2005 and 2006 (either side of the 80% mark), with 2007 and 2008 showing higher levels of 'first time' investments.

Investments over £2 million represent a large share of the total market, but are few in number: 11 in 2009, 15 in 2010, and 10 in 2011. A perusal of deals listings by those VCs which publish figures suggests that Scotland appears to fare worse than other regions of the UK in securing large investments from VC firms, and most of those that have invested in Scottish companies do not do so on a

regular basis. VC firms themselves are going through a period of considerable change, as set out in Professor Colin Mason's commentary in the 'Implications for Scotland' section. From the consultations held in parallel with the data research, it became clear that there is scope for Scottish companies to increase substantially their engagement with VC firms outside Scotland; however, increasing the level of investment above the £2 million per deal level is a question of building demand, encouraging companies towards not only better promotion but also more compelling propositions.

At the opposite end of the scale, investments under £100k were in 2011 at their lowest level for seven years, in terms of both number and amount invested. This end of the market is also experiencing considerable change. Although angel syndicates profess themselves keen to invest in new companies, they are held back by the need to support portfolio companies with more money over a longer period than before. VC firms have to all intents and purposes abandoned the start-up and seed phases of investment, now requiring companies to have achieved some market traction before they will invest. Despite these reservations, the last three years saw 101 companies secure investment for the first time (2009:31, 2010:42, and 2011:28). But for the future it looks as though new funding mechanisms and business models, such as crowdfunding and lean starts, may play more of a part for start-up companies.



In the middle size investment band, business angel investment has held up well, considering the difficulties which syndicates face in providing increasing amounts of follow on finance to a mature portfolio of companies while keeping their membership keen to invest when there are limited exits and meaningful returns. Funds are certainly limited, meaning that investors are more selective, but they require the quality of the investment propositions to keep pace.

The majority of angel-led investments are in the East of Scotland and the share accounted for by the West has fallen sharply in 2011. This regional distribution is long-standing, and appears to be widening. While investment naturally flows to opportunities, stimulating demand from growth orientated ventures located in the West remains a major challenge.

The life sciences and renewables sectors are major recipients of early stage risk funding, impacting on the long held dominance of enabling technologies. While enabling technologies continue to lead sector investment with 31% of the total (2009-2011), life sciences follows at 29% with renewables at 22%.

Exits and the liquidity they bring is key; the various supply side measures, notably co-investment, have allowed investors to maintain a level of activity and hence have helped keep investment levels and activity higher than would have otherwise been the case. Exit opportunities are being severely curtailed, reducing investors' capacity to recycle investment into new ventures. Investors depend upon exits such as flotations or trade sales to make returns on their money which can be used to re-invest in further emerging ventures. Companies and their investors have had to be patient, with the average age of an investment reaching an exit in 2010 averaging 9 years; in 2011 it was 10 years.

An earlier market report (2008) commented: "Under current market conditions a continual flow of new investors will be needed to maintain the capacity to invest in high growth start up and early stage ventures". When the Co-Investment fund was launched in 2003, there were only two established angel syndicates and four relatively new syndicates. As a result of the policy focus on this area, ten new syndicates have been created since 2008, resulting in a current total of 19 syndicates investing in Scottish growth companies.

The final section of this report, written by Professor Colin Mason, considers the policy implications arising from the report findings, and seeks to set these in a wider context considering international developments and trends impacting on equity investment as a whole.

Suggested next stages

Explore alternative start-up models

Start ups are non revenue positive and are less attractive than more mature businesses looking for funding that would previously have come from the banks. The emerging pattern of early stage investing is for companies to keep costs low in the initial stages, and manage with as little external investment as possible, acknowledging that many ventures will be discontinued before attempting to secure significant funding, but also recognising that investors (VCs in particular) are prepared to invest larger amounts at a later stage than before, in those companies which have significantly 'de-risked' the investment.

There is a need to look at the whole range of start up business models for all sectors, including lean start-ups, bootstrapping, crowdfunding and other soft financing options, and the role of accelerators.

This should also include management breakouts, where managers or teams within an existing business want to start their own venture.

Map out routes to market and routes to exit

It is believed that young technology companies have difficulty in defining their market opportunities and routes to market. For any company seeking equity investment, it is important to be able to demonstrate how investors will be able to make a profitable exit. Companies need to understand investors' requirements, and there is a need to confer with investors so that these requirements can be defined and made explicit, and communicated effectively to young companies.

Adapt to the increasing segmentation of the market

As the risk capital market evolves, it is clear that a 'one size fits all' approach is no longer appropriate. Because business angel groups have been the most prominent feature of the market in recent years in Scotland, they have sometimes been expected to cover all the funding requirements of every type of young company. This is unrealistic; the angel groups have been particularly helpful in helping to establish and build the entrepreneurial ecosystem in Scotland, and continue to have a major role to play in helping young technology companies get started. As with successful angel groups in the USA, they focus on a middle range of companies with realistic prospects of achieving a profitable trade sale within a few years, and this process helps build what is hoped to be a self-perpetuating system in which entrepreneurs, investors, and advisers all benefit from a repeatable experience. This is different from VC investment, where the investors hope to find exceptional high growth businesses and achieve substantial returns.

From a public policy point of view there is merit in tailoring funds to the needs of particular market sectors, or in the case of sectors such as life sciences and renewable energy which have distinctive requirements, setting up dedicated funds adapted to these requirements.

Much of the commentary on the risk capital market focuses on 'webtech', or digital media B2C ventures, and on the USA, particularly Silicon Valley. Scotland has an underdeveloped digital media sector, which may well have great promise, but will not achieve its full potential by following the same funding routes as those tracked by actual investments in this Report. Even the Babson Entrepreneurship Ecosystem Project in Boston Massachusetts has as its first principle 'Stop emulating Silicon Valley', and as its second 'Tailor an ecosystem around your own particular characteristics'.

It is necessary for all those concerned with the risk capital market in Scotland to recognise these principles, and to adapt funding initiatives and programmes for assisting young companies to the different sources and types of investment available.



Capitalise on changes in the VC market

To take the previous point further, it is clear that Scottish companies have been less successful than those in other regions in attracting VC investment, and this is where the greatest opportunity exists to increase the flow of risk capital. The VC market itself has been in a state of flux recently, and many VC funds in the USA and Europe have performed poorly. Consequently there has been a polarisation of the VC industry, with some 'mega-funds' emerging, while others downsize and become niche players with sector specialisms. It is important that young companies in Scotland, and their advisers, recognise and monitor these changes, and ensure that they come to the attention of relevant fund managers outside Scotland, and fully understand the criteria on which their ventures will be judged by such investors.

Assess the need for growth capital

There are difficulties for companies which have received substantial angel investment to reach the next level, and secure further funding. This issue needs to be evaluated to see how many companies are affected, and what might be done to bridge this perceived equity gap.

Monitor the availability of IPOs

Although it is almost universally accepted by investors that 'the IPO door is closed' as a means of realising an investment, nonetheless an IPO has some significant advantages over a trade sale. The company retains its own identity, and research shows that VC-backed companies after an IPO have historically performed better than other early stage companies. Quoted companies will not necessarily stay anchored in their country of origin (indeed, being quoted increases a company's profile significantly, and takeovers are a perpetual threat), but they do have some control over their future.

For this reason it is important that young companies and their advisers understand why an IPO is not at present a practical proposition for most ventures, and that they monitor those factors which could change this situation.

Explore the possibilities for accelerating trade sales

There is little doubt that the market is being held back by a lack of trade sales for companies in the portfolios of VCs and angel groups. While all investors are doing their best to find exit routes for their most mature companies, it is possible that more could be done to help in researching the M&A market and identifying and engaging with potential acquirers.

Implications for Scotland

This final section has been prepared by Professor Colin Mason and discusses the findings from the preceding analysis of the Scottish early stage risk capital market in a wider context, taking into account the most recent global trends impacting on the different investor groups and the type of companies that seek equity capital. This recognises that these developments will inevitably influence the continued evolution of the Scottish early stage risk capital market


The risk capital market: an overview

Risk capital – better known as venture capital – is a distinctive type of finance for entrepreneurial businesses. It is not a financing option for small lifestyle businesses. Entrepreneurial businesses are those with both the ambition and potential to achieve significant growth. This growth potential is typically based on intellectual assets – a technological innovation or a new business model. They are also likely to have significant financial needs to develop the technology and achieve a significant market presence. However, their uncertain prospects and negative earnings, alongside information asymmetries which make it hard to assess their prospects and lack of physical assets, makes them unlikely candidates for bank loans or other types of debt finance. They need to attract funding from investors who are willing to share the risks of investing in such businesses with the entrepreneur, but also to share in the rewards should the business be successful. The form of finance that meets these requirements is equity finance, with the investor taking an ownership stake, typically a minority stake, in the business. Clearly, the entrepreneur has to take the view that owning the majority of a large, successful business is a better outcome than owning all of a business that remains small because it does not have the finance to grow.

The main source of risk capital - in terms of the total amount that they invest – is venture capital firms (VCFs). These are professional investors who raise funds from financial institutions, endowments and individuals to invest in a portfolio of companies, thereby spreading their risk. They are also able to mitigate risk through their screening and selection skills, contracting skills and ability to add value to their investee businesses. However, the reality is that many of the investments made by VCs fail, and most of the remainder do little more than return the initial investment, with fund performance highly dependent on just one or two very successful investments – or ‘home runs’. Increasingly, many large non-financial companies, recognising the limits of their in-house R&D activities, have also established their own investment funds (corporate venture capital - or CVC, funds) as a means of keeping abreast of emerging technologies, encouraging potential customers and having a first option on possible acquisition candidates.

However, the high fixed costs of investing means that it is uneconomic for VCFs and CVC funds to make small investments (under £500k). Hence, it is extremely unusual for these types of investors to invest in businesses at their pre-start-up or start-up stages. Entrepreneurial businesses therefore utilise ‘3F’ funding (Founder, Family, Friends) and bootstrapping (creative strategies to gain the use of resources at below the market price or no cost) to get to the stage where VCs might be interested in investing. If this is insufficient, then they would look to business angels who are by far the main source of seed, start-up and early stage funding, typically investing amounts well below £500k. As such, whereas they invest less in total than VC funds, the number of businesses that they finance is significantly greater. Business angels are defined as *high net worth individuals who invest their own money, along with their time and expertise, directly in unquoted companies in which they have no family connection, in the hope of financial gain.*¹²

12. Mason, C.M. (2006) ‘Informal sources of venture finance’, in S C Parker (ed) *The Life Cycle of Entrepreneurial Ventures*, New York: Springer: New York, pp.259-299.



Most business angels invest on their own or in small ad hoc groups and hence their investment activity goes largely unobserved and unreported. But in recent years angel groups have emerged. These groups typically comprise upwards of a dozen angels and often support a manager (often termed 'gatekeeper'). This trend has been driven by a recognition amongst many business angels that investing in groups provides superior deal flow, learning from other investors, diversification, and the ability to make follow-on rounds, thereby reducing the risk of dilution. Although accounting for only a small proportion of the angel population, their importance is much greater in terms of amount invested. Indeed, angel groups now represent a distinct finance category. The emergence of angel groups has been a much stronger feature of the Scottish risk capital market than elsewhere in the UK or, indeed, Europe.

The risk capital market therefore comprises business angels and venture capital funds. Both categories can, in turn, be subdivided. Angels can be divided into those who invest on their own ('lone wolves') and those who invest as part of a group (although in reality some will straddle both categories). Venture capital funds can be subdivided in a variety of ways – by ownership, investment focus, size of fund, stage of investment.

A further form of risk capital is private equity. VCs invest money in young companies which is used for productive purposes to enhance growth. Private equity, in contrast, invests in existing businesses – often very large businesses – to facilitate ownership change and restructuring. This is often achieved through de-listing publicly-listed companies and taking them private where they can be restructured away from the public scrutiny that comes with being a public company. Another common type of private equity investment is to fund management buyouts (MBOs) which enable the management team of a division or subsidiary of a large company to buy it from its parent group to run as an owner-managed business. This process therefore converts what was an externally-owned business into a locally-owed, managed and headquartered business. Less prominent are management buy-ins (MBIs) in which a private equity fund finances an external management team to buy an established business. MBIs generally occur in smaller businesses, for example in situations when the existing owner wishes to retire. Most of the activities of private equity funds therefore do not occur in the risk capital market. However, smaller MBOs and MBIs can be considered as part of the risk capital market. Indeed, previous research for Scottish Enterprise has noted that a significant minority of high growth firms in Scotland are either MBOs, MBIs or employee buyouts (EBOs).¹³ It is therefore important that policy-makers do not take a narrow view of the risk capital market as simply comprising finance for business start-up and early growth.

13. Mason, C and Brown, R (2010) *High Growth Firms in Scotland*, Scottish Enterprise. Mason, C and Brown, R (2012) *Technology Based Firms in Scotland*. A report to Scottish Enterprise.

Why venture capital matters

It is now well established that technological innovation is critical to economic development. There is now considerable evidence to show that the venture capital industry plays an important role in encouraging innovation. The types of firms that VCFs invest in are typically young, innovative businesses which are able to use the funding that they receive to invest in research, hiring of key personnel, market scale development and marketing. They also derive benefits from the involvement of the venture capitalist in terms of shaping the management team and board, strategy development, networking, and credibility. As a result, VC-backed firms grow faster than non-VC backed companies. For VC-backed companies that go on to an IPO this growth effect continues long after the VC has exited the business. The upshot is that venture capital has played a key role in the emergence of new industries, including computer software and hardware, biotechnology, computer services, industrial services and semi-conductors by seeding the fledgling companies that came to dominate these industries. They are expected to have a similar role in the energy and environmental industries.

The equivalent evidence on the impact of business angels on their investee companies is lacking, although it is clear that such businesses benefit from the 'hands on' contributions of business angels. However, as many of the more significant venture capital-backed firms have raised initial funding from business angels their economic impact is captured as part of the venture capital impact. This positive picture of the role of venture capital in driving innovation needs to be qualified in several respects. First, it is very much based on US evidence. The US currently accounts for some 80% of global venture capital investment. Hence there is much less venture capital available in other countries. Moreover, venture capital activity in other countries is distinctive from the US model. Hence for both reasons it is inappropriate to assume that venture capital has the same economic impact in the rest of the world as it has had in the USA. And second, the evidence is historic, relating to the pre-2000 era. Again, it cannot be assumed that VC will continue to have the same level of impact on innovation and entrepreneurial development that it had in the past.

Indeed, a recent paper by Popov and Roosenboom¹⁴ suggests that the European venture capital industry has been less efficient in promoting industrial innovation than its US counterparts and that the effect of venture capital on innovation in the US has tailed-off over time, being stronger in the 1970s and 1980s than subsequently. Third, the earlier analysis suggests that venture capital enabled innovation to occur. However, other studies suggest that innovation comes first, with innovative firms seeking venture capital to exploit their innovations. Indeed, Harvard scholar Amir Bhidé¹⁵ has emphasised that VCFs do not invest in businesses that need to pursue basic engineering and technological advances nor those that are seeking to develop ground-breaking technologies because of the high level of uncertainty associated with the commercial prospects. What VCFs do invest in are businesses which already have technological foundations (they may already have patents) with mid-level know-how, building on high-level know-how developed elsewhere, already have sizeable sales and where there is evidence of large numbers of potential users who have not yet become customers.

In summary, venture capital is certainly a key factor in high growth businesses, with recent evidence from Experian¹⁶ noting that venture capital-backed firms in the UK perform much more strongly in terms of revenue and employment than their counterparts that have not raised VC. Moreover, this is not simply a selection effect. However, the role of venture capital in promoting innovation is much less straightforward.

Policy-makers therefore need to have a realistic understanding of the venture capital industry and, in particular, the connections between venture capital and innovation, and not hold on to an historic view that is no longer relevant. US evidence indicates that VCFs invest in mid-level technology businesses which have good prospects of rapid commercialisation. They do not invest in businesses that are developing technology and which will require to create a market. But whether all of this holds in the case of emerging areas of venture capital investment activity – notably renewable energy – remains unclear and should be closely monitored by policy makers.

14. Popov, A and Roosenboom, P (2012) Venture capital and patented innovation: evidence from Europe, *Economic Policy*, July, 447-482.

15. Bhidé, A (2010) *The Venturesome Economy*, Princeton and Oxford: Princeton University Press.

16. Experian (2012) *Exploring the Success of Venture Capital-Backed Companies*, Experian and BVCA

Venture capital in crisis?

As argued above, the time context is critical to understanding and interpreting investment trends. In the time period covered by this Report the venture capital industry has struggled to make a financial return, prompting various commentators to suggest that it is in 'crisis'. However, others take a more sanguine view, arguing that any problems are only 'cyclical'. But as developments have become clearer, it is difficult to avoid the conclusion that rather than simply downsizing, the traditional venture capital industry is in the early stages of transformation. While much of this debate is occurring in the USA and refers to the US venture capital industry, it is clear that similar developments are also affecting the venture capital industry in Europe.

The roots of the venture capital industry's current predicament are in the dot-com era. Because VCFs typically raise funds with a 10 year duration, change in this industry typically occurs in slow motion. The euphoria associated with the commercialisation of the internet in the late 1990s resulted in a 250 per cent increase in deals from 1997-2000 and a quintupling of dollars invested. Returns also rose spectacularly. This, in turn, attracted a huge amount of money from a variety of investors. This money enabled existing VCFs to raise larger funds and new VCFs, many of them inexperienced, to enter the industry. The effect of the much increased size of funds was to increase the size of investments compared with the 1980s and 1990s, largely because of a big increase in follow-on investments (now accounting for \$4 for every \$1 initially invested, compared with less than \$3 prior to 2001), and a move to later stage investments, with seed investing accounting for less than 10 per cent of investments compared with 18.7 per cent in the 1990s and 25 per cent in the 1980s.¹⁷ All of this additional money competing to invest in companies inevitably drove up the cost of investments and, in turn, drove down returns.

In what has been termed the 'golden era' for venture capital investing, from 1980-1997, average quarterly returns from venture capital was 22 per cent, representing a significant premium over the S&P 500. However, in the 2000s venture capital returns have fallen below the S&P 500 and at the end of 2009 the 10 year return turned negative.¹⁸

Falling returns have been driven by three factors. First, as the post-2000 dot-com boom turned to crash many of the businesses that had attracted VC investments in the boom years failed, highlighting the poor quality of the investments made. Second, the returns from a VC fund depend on it having a small number of investments that make very high returns – or 'home runs'. The returns from these investments more than offset those in businesses which fail and which achieve only moderate success. These 'home runs' are generally achieved through Initial Public Offerings (IPO) which in the USA on average generate five times the returns from acquisitions. However, for much of the 2000s the IPO markets in both the USA and the UK have been 'closed',¹⁹ meaning that there have been significantly fewer IPOs than in the past and those which have occurred have taken longer to achieve. There has been a particularly severe decline in smaller \$200m-\$300m companies completing an IPO. Fewer exits have, in turn, meant that VCFs have paid back less to their investors (the Limited Partners) than what they took in. The Ernst & Young Global 2011 Global VC Survey²⁰ reports that VCFs throughout the world think that the level of IPOs is too low to sustain the venture capital industry. And because non-US based VCFs look to the NASDAQ for exits, the implications of the low level of US IPOs are not confined to the US venture capital industry. The third factor is that it exposed that venture as an asset class does not scale. Commenting on the huge growth in the funds under management by VCFs Tom Perkins, co-founder of Kleiner Perkins, one of the key figures in the industry, has observed that 'mathematically, there's no way VC in America will [continue to] make \$10 for every dollar invested – a fairly typical return in past years.'²¹

17. Shane, S (2011) Venture capital: no longer a business of small investments in early stage companies, *Smallbiztrends*. Com 15 August.

18. Ghalbouni, J and Rauzles, D (2010) The VC shakeout, *Harvard Business Review*, July.

19. Weild, D and Kim, E (2009) A Wake Up Call For America, Grant Thornton Capital Market Series. Weild, D and Kim, E (2010) *Market Structure is Causing the IPO Crisis and More*. Grant Thornton Capital Market Series

20. Ernst and Young (2012) *Globalizing Venture Capital: global venture capital insights and trends report 2011*

21. Venture capital veteran Peters sees dangers ahead, *Reuters*, 13 September 2011



Falling returns has reduced the attractiveness of venture capital as an asset class for financial institutions. Even though it only attracts a small proportion of the assets of these institutions – under 4 per cent - some major institutions have been reducing their exposure. This has had several consequences for the shape of the venture capital industry in both the USA and Europe. First, there has been a significant decline in the amounts raised by VCFs since 2000. Indeed, the amounts invested by VCFs have exceeded the amounts raised since 2008. Second, there has been a decline in the number of active VCFs, possibly by as much as two-thirds. Third, both the number of investments and the amount invested has fallen. Investment activity in 2009 was the lowest since the start of the dot.com boom in 1997. Fourth, those VCFs that have been able to raise new funds are the small minority that have generated high returns for their limited partners. These VCFs (eg Accel, Bessemer, Greylock, NEA, Sequoia) have a strong brand from having invested in companies such as Apple, Cisco, Google and the like which attracts a high quality deal flow. Meanwhile, seed investing has contracted. Fifth, there is a growing trend – particularly amongst those large VCFs with strong brands, to invest internationally, with China exhibiting significant growth in venture capital activity as a result of investments by US VCFs.²² Meanwhile, within countries, VC investing has concentrated on the economic core regions, thereby creating ‘regional equity gaps’ which has prompted government intervention. Indeed, in all regions of the UK apart from London and the South East, the majority of venture capital investments involve the public sector, either investing on its own or co-investing with private sector VCFs.²³

Here again, the implication for policy-makers is the need to have an up-to-date understanding of the venture capital industry. Initiatives need to be relevant to the current investment environment rather than being based on some (probably mythical) ‘golden era’.

22. Ernst and Young, op. cit. Sequoia Capital's \$1 billion raise is very much about going global, *TechCrunch*, 29 May.

23. Mason, C and Pierrakis, Y (2011) 'Venture capital, the regions and public policy: the United Kingdom since the post-2000 technology crash', *Regional Studies*, online

A new funding environment

On the demand side there has been a fundamental change in 'start up economics'. It costs a lot less to start a business now compared with ten years ago or longer. In the 1990s it might have taken \$5m to start a company. Now, cloud-based software, web and social media combined with lean start-up techniques²⁴ to provide capital efficiency enables companies to be launched for \$500,000 or less and sustain a low burn rate. This means that new businesses can start with little or no capital, before going on to raise finance from angels or VCFs, but might then be able to achieve profitability or an exit with little or no follow-on investment. When companies need less money, VCFs also need less money.²⁵ This has created various difficulties for traditional VCFs. First, because of the large size of their funds, they are not well positioned to make such small investments. Second, these investments require different skills to the traditional venture capital skill set, notably helping such companies to scale.

There are two important qualifications to this 'low capital needs' perspective. First, the significant change is the timing of investments, rather than overall capital requirements. As VC and blogger Fred Wilson notes, 'what has changed in technology VC is not so much the total capital requirements, but when they are required. Entrepreneurs now raise big money later when the business is worth more. It also means VCs don't need to take any risks early on'. Second, these trends are confined to software. The economic models of industries such as cleantech, biotech and other capital intensive, technology sectors have not fundamentally altered and in these sectors VCFs operate largely as before. This prompts Wilson to warn that 'I don't think you can make blanket statements about the VC business anymore'.²⁶ This growing diversity of the venture capital landscape is reflected in the Report's findings.

These demand-side changes, along with the supply-side changes discussed in the previous section, are producing a new risk capital landscape.

The traditional venture capital industry is downsizing but at the same time there has been a surge in seed capital investing which is being driven by new types of investors, notably business angel groups, super angels, micro funds (typically \$20-\$30m in size) and business accelerators which provide time-limited support for team start-ups in the form of pre-seed investment, intensive mentoring and programmed events.²⁷ Many business angels, suffered high losses as a result of businesses failures and dilutions forced on them by VCFs during the dot.com collapse. Many dropped out of the market but others have regrouped, recognising the benefits of investing in organised groups. Hence, we have seen a major expansion in angel groups, particularly in the USA, with sufficiently deep pockets both to make substantially bigger investments than the traditional solo angels investing on their own or in ad hoc syndicates, and also follow-on investments. This, in turn, has created a significant new actor – the angel group manager, or 'gatekeeper'. Super angels are extremely wealthy, often high profile cashed-out serial entrepreneurs. What differentiates them from angel and angel groups is their scale of investment. Although there is considerable diversity amongst angel groups²⁸ a common strategy is to make lots of small investments, supporting the small number of promising ones which have proved that the concept works but before they have proved the market, which requires considerable further investment, with a view to selling them to a defined group of cash rich acquirers. As noted above, some super angels have 'blended' their money with that of others to create micro VC funds, hence there is a blurring of the two categories.

These new market entrants have new models of investing.²⁹ Their approach is to adopt a sector focus, investing in niche businesses, providing them with extended runways because of their capital efficiency and resulting low burn rates, and contributing value-added in the areas of product development, marketing and sales and connections to downstream investors and acquirers.

24. Riess, E (2011) *The Lean Start Up: How Today's Entrepreneurs Use Continuous Improvement to Create Radically Successful Businesses*. New York: Crown Business.


25. Kedrosky, P (2010) *The coming super-seed crash*, paulkesrosky.com, 26 June

26. Wilson, F (2010) *A VC: some thoughts on the seed capital phenomenon*, www.avc.com, 14 July.

27. Miller, P and Bound, K (2011) *The Startup Factories: The rise of accelerator programmes to support new technology ventures*. London: NESTA.

28. Sudek, R, May, A and Wiltbank, R (2011) *Angel Investing: Catalyst for Innovation*, Angel Resource Centre.

29. Suster, M (2011) *Understanding the changes in the software and venture capital industries*, Pehub.com, 27 June.



Their investment decision is based on the quality of the team rather than the product. Using their sector expertise the objective of these funds is to build businesses that might become attractive acquisition candidates. Indeed, the emergence of large, cash rich technology companies such as Google, Microsoft and Cisco as buyers of young technology companies has facilitated this micro-VC investment model. Significantly, most of the companies that are acquired have capitalisations of less than \$30m. In contrast to the traditional approach of VCFs this investment model does not need 'home runs' but is sustainable on more modest exits.

In summary, US evidence suggests that the venture capital industry is bifurcating into a small number of mega funds and large number of micro funds, with a few funds in the middle maintaining the traditional model, and an increase in seed capital investing by a variety of new players. The growth of mega funds reflects the flight to quality by Limited Partners, noted earlier, which has resulted in, on the one hand, a sharp decline in the number of funds able to raise new capital, and the growth of mega funds managed by the small number of VCs with strong investment performance which have raised billions. These trends are also apparent in the UK.

Both trends have raised concerns amongst commentators. There is some anxiety about potential dangers arising from the reduced number of (very large) investments, the overly cautious attitude of such funds and the resulting lack of diversity and innovation. Bryce Roberts argues that "the less diversity in upstream capital the less diversity [sic] the idea that gets funded will be."³⁰ There is also disquiet that the rapid increase in seed capital investments in web-based businesses is creating a 'start-up bubble'. While getting a business off the ground is now cheap it still requires a lot of money to build a big business – even a web business. Very few will be able to do this on the basis of sales revenue.

This means that there is an emerging demand from start-ups that have been funded by angels, super angels, accelerators and micro VC funds for Series A rounds, which makes 'traditional' VCFs as necessary as they ever were. However, other commentators question whether amongst the thousands of start-ups raising finance there are enough that are solving big enough problems to aspire to \$100m exits and hence be attractive to follow-on VC investment, whether there is enough market space to differentiate hundreds of new companies³¹ and, fundamentally, whether there is sufficient Series A money available. Others have raised concerns about the economic impact of such trends. The first relates to the exit strategy of angel groups and super angels. It is argued that by selling these companies they may be cutting into the deal flow of later stage VC funds, thereby destabilising the traditional VC food chain. Furthermore, they may be cutting short the lives of potential new 'gorillas'. In other words they may be eliminating the possibility that one of their investee companies becomes 'the next Google' by selling it to Google. The second relates to the concern that investing in social media and web application businesses will not generate the same scale of economic benefits that venture capital investments generated in the past. Of course these concerns relate to ICT sectors rather than to other sectors in which VCFs invest, and which attract much less attention. However, these concerns are significant precisely because the ICT sectors attract the majority of venture capital investments. New data on venture capital investments in technology sectors in the first half of 2012 in the UK indicates that much of the money has gone into internet, mobile and digital media companies whereas areas such as semi-conductors and software has seen a decline in funding.

30. Roberts, B (2011) Fear of a VC monoculture, *Fortune Finance*, 23 May.

31. Kedrosky, *op. cit.*

The funding escalator

The financing of entrepreneurial businesses has often been represented as a funding escalator in which growing companies would initially raise funding from the '3Fs' – founder, family and friends – and might then be able to access public sector grants and other forms of financial support. Further funding would be raised from business angels and venture capital funds, culminating in an IPO. Critical in this model is the relationship between business angels and venture capital funds. Traditionally, these two sources of funding have been seen as complementary³², with business angels providing small amounts of seed and start-up funding, while VCFs make larger investments to provide finance for growth and development. Many of the firms which initially raised finance from business angels would therefore go on to raise follow-on finance from venture capital funds after having been de-risked by the angel.³³ This prompted some commentators to use the metaphor of a relay race to describe this relationship: "Angel investment runs the critical first leg of the relay race, passing the baton to venture capital only after a company has begun to find its stride. Venture capitalists focus ... on expansion and later stages of development, when their contribution is most effective."³⁴ However, the evidence in this Report, consistent with evidence from elsewhere (e.g. Gill³⁵) is that the funding escalator no longer operates to any great extent and, arguably has not been a significant feature in the market since before the dot.com bubble burst, when 3i was an important investor. Specifically, it is no longer the norm for angels to routinely pass their investee companies up the food chain to VCs.

There are several reasons for this, many of which have been alluded to earlier. First, the post-2000 technology crash seriously damaged relationships between angels and VCs. In the aftermath of the crash the value of previous investments were written down.

When those companies were refinanced it was at much lower prices (down rounds) so angels found that their investments were massively diluted. Many were unable to participate in a down round and so suffered from 'cram down' (in which VCFs would only invest new capital into a company on condition that the existing investors accept adverse changes to the terms of their original investment). Because angels are generally the earliest investor they are most at risk in such situations. Nevertheless, many felt that VCFs had used their much greater financial resources to exploit their weakness. The consequence was that angels lost trust in VCFs and were no longer willing to invest in deals that would require follow-on investment. Second, angels recognised that they could reduce risks by joining together to invest in groups. From a defensive point of view this would give them greater financial resources to do follow-on investing and thereby avoid dilution. It also enables individual angels to spread their investments, thereby achieving greater diversification. Other benefits include superior due diligence and post-investment support. Third, as venture capital funds have become larger, so their investment focus has shifted to larger and later stage deals. As Professor Scott Shane observes, it "is no longer about making small early stage investments in high potential companies. Today's venture capital industry is much more about later stage deals involving much follow-on investing".³⁶ This has required angels to undertake more funding rounds. Since multiple funding rounds is beyond the capability of most individual angels this has also driven angels to invest collectively.

32. Freear, J and Wetzel, W (1990) Who bankrolls high-tech entrepreneurs? *Journal of Business Venturing*, 5, 77-89

33. Freear, J and Wetzel, W (1989) Equity capital for Entrepreneurs, Paper to the 1989 Babson Entrepreneurship Research Conference; Madill, J. J., Haines, G. H. jr. and Riding, A. L. 2005, The role of angels in technology SMEs: a link to venture capital. *Venture Capital: An International Journal of Entrepreneurial Finance*, 7: 107-129.

34. Benjamin, G A and Margulis, J (1996) *Finding Your Wings: How to Locate Private Investors to Fund Your Business*, New York: Wiley, p 71.

35. Gill, D (2010) *The Collapse of the Funding Escalator: how it happened and what to do about it*. St John's Innovation Centre, Cambridge. Presentation to IfM, 24 June.

36. Shane, *op. cit.*



Finally, a combination of lower capital start-up requirements, particularly in web-related businesses, and the eagerness of established companies to acquire young technology companies has created the opportunity for what Basil Peters has termed the 'early exits' investment strategy.³⁷ This involves investing in companies with limited funding needs which are therefore unlikely to require follow-on finance from VCFs and which can, over a relatively short period of time, become an attractive acquisition candidate for a bigger technology company. And while the investment return in terms of multiple may be quite low (e.g. x2 or x3) the low dilution and short holding period means that the IRR is high. Reinforcing the attractiveness of this strategy Peters argues, with data on US angel investment returns from Wiltbank and Boelker³⁸, that angel investments which go on to raise further funding from VCFs have a higher failure rate than those that just have angel investors. The rules of the UK's Enterprise Investment Scheme, which requires angels to invest in ordinary shares, and sits uneasily with the use of different investment instruments (typically preference shares) by venture capital funds, is an additional but important institutional factor which has discouraged, or prevented VCs from making follow on investments in businesses that have business angel investors.

Three conclusions follow. First, business angels and VCFs need to be seen as distinctive and increasingly separate funding sources, investing in different types of businesses.

Second, it seems likely that business angel groups will continue to play a major role in Scotland's risk capital market. The organisation of the Scottish angel market into formal angel groups is regarded as a positive development. Sohl³⁹ expresses concern that the shift from an angel market dominated by individuals and ad hoc groups to one that is organised by gatekeeper-led formal groups may lead to the erosion of value-add and the active nature of angel investing. Others, however, argue that many angel groups are able to draw on deep domain and business expertise from various individuals within their groups.

Third, it would also seem likely that angel groups will have to fund the vast majority of their investments to exit. The need to take their investments most, or all of the way to exit themselves should prompt angels to think more strategically not just about how to exit from their investments but also about what types of investments to make.

37. Peters, B (2009) *Early Exits: Exit strategies for entrepreneurs and angel investors (but maybe not venture capitalists)*, Vancouver: Meteor Bytes.

38. Wiltbank, R E and Boeker, W (2007) *Returns To Angel Investors in Groups*. Kansas City: Kauffman Foundation.

39. Sohl, J (2012) The changing nature of the angel market. In H Landström and C Mason (eds) *The Handbook of Research on Venture Capital: Volume II*. Edward Elgar: Cheltenham.

Exits

Achieving an exit – a harvest event – is a fundamental part of the risk capital market. Investors are investing for capital gain and at some point in time will want to realise the wealth that has been created by the combination of the talent of the entrepreneur and the money that has been invested. The general trend is for fewer exits as a proportion of investments made and for them to take longer to achieve. The Report highlights the lack of exit opportunities for both VCs and business angels. As noted earlier, this is one of the factors behind the current difficulties faced by the VC industry. Arguably the lack of exits is an even bigger issue for business angels. There are three concerns.

First, the exit process has been treated, at best, as an afterthought. Angels have in the past typically given very little thought to future exit routes, do not have clear exit plans at the time of investing and have been relaxed about its timing. The view, expressed by a former angel group gatekeeper, that “good investments will always find exits” was typical. Meanwhile many of the angels which did have a view on the exit expected it to be through a stock market floatation, in defiance of the evidence that this is an extremely rare means of achieving an exit. Although many investors continue to hold these views, others now recognise that the exit needs to be addressed before the investment is made⁴⁰ and that a trade sale will be the most likely exit route.

The form that public sector interventions have taken to promote the angel market has also emphasised making the investment ahead of the exit. By reducing the cost (through front-end and roll-over tax reliefs) and increasing the potential returns (by reducing or eliminating capital gains tax), tax incentives have sought to increase the number of individuals who become business angels and encourage existing business angels to make more frequent and bigger investments. There is earlier evidence that such schemes are effective in influencing angels in their portfolio allocation decision⁴¹ and that usage is high.⁴²

The focus of business angel networks, through their match-making and training courses for entrepreneurs and investors (e.g. investment readiness), have also been on facilitating investments. Public sector co-investment schemes, which invest alongside business angels, are intended to enhance their liquidity in a context where the funding escalator is broken as a result of the contraction in the availability of early stage venture capital,⁴³ and are also investment focused. Only now, for the reasons outlined below, is there a growing recognition – at least amongst some of longer established and more professional, angel groups in North America and the UK – that the ‘build it and they will come’ approach to investing is no longer appropriate and that there needs to be much greater emphasis on the exit process.

Second, recent evidence from Wiltbank on angel returns in the USA and UK⁴⁴ indicates that the majority of angel exits fail to return capital and the most likely outcome for any individual angel investment is failure. The UK study reported that although the average IRR was 22%, more than 55% of investments made a partial or total loss, and only 9% of exits achieved a 10 times or greater return.⁴⁵

This is similar to the earlier findings of Mason and Harrison who reported that 47% of angel investments were a total or partial loss, while 23% achieved an IRR of 50% or more.⁴⁶ Shane summarises the situation in the USA as follows: “very successful angel investing is quite rare and the typical angel investment does not perform as well as the typical investment in other asset classes”.⁴⁷ Various commentators have interpreted these figures as suggesting that the exit process needs to be executed better on the grounds that it is difficult to accept that all of the businesses that failed were ‘bad’ businesses.

40. Mason, C M and Harrison, R T (2012) Emerging exit-oriented strategies in business angel investing: implications for policy and research. Paper to the 2012 ISBE Conference, Dublin, 5-7 November
41. Mason, C M and Harrison, R T (2000) 'Influences on the supply of informal venture capital in the UK: an exploratory study of investor attitudes', *International Small Business Journal*, 18 (4) 11-28.
42. Mason, C M and Harrison, R T (2010) *Annual Report on the Business Angel Market in the United Kingdom: 2008/09*. Department of Business, Innovation and Skills. Mason, C M and Harrison, R T (2011) *Annual Report on the Business Angel Market in the United Kingdom: 2009/10*. Department of Business, Innovation and Skills
43. Pierrakis, Y (2010) *Now and After the Dotcom Crash*, Research Report, London: NESTA
44. Wiltbank and Boeker, op. cit.; Wiltbank, R E (2010) *Siding With the Angels. Business angel investing – promising outcomes and effective strategies*. London: NESTA.
45. Wiltbank, op. cit.
46. Mason, C M and Harrison, R T (2002) Is it worth it? The rates of return from informal venture capital investments, *Journal of Business Venturing*, 17, 211-236.
47. Shane, S A (2009) *Fools Gold? The truth behind angel investing in America*, New York, Oxford University Press, p. 161

Of course, it is much harder for angels to learn how to achieve successful exits than to learn how to make an investment simply because they are much less common. For example, only 21% of the investments made by the respondents in Wiltbank's UK study had produced a positive exit.⁴⁸ In Mason and Harrison's study the proportion was 19%.⁴⁹ Moreover, these were skewed to the most active investors. In addition, when the 'relay race' model of investing was common there was an acceptance that angels would only do one or two funding rounds and thereafter high growth companies would be funded by venture capital funds and, significantly, they would manage the exit process. For these reasons the majority of individual investors have little or no experience of an exit from which to learn and there is less collective experience from which commentators can draw upon. Indeed, Smith et al's study of the effect of investment experience on learning found that even the more experienced angels did not report any learning associated with the exit process.⁵⁰ Rather, all of the learning was associated with the process of making investments.

Third, the empirical evidence indicates that exits are becoming harder to achieve. For the reasons discussed earlier, angels are having to do more funding rounds themselves and this lengthens the time to exit. With less liquidity, the lack of exits in turn, is reducing the ability of angels to make new investments.

There are also wider implications. The lack of successful exits will demoralise existing angels and deter potential angels from investing, and prevents the recycling of returns. Indeed, managers of angel groups acknowledge that they need to be able to demonstrate the ability of the group to make a financial return in order to attract new members. From a policy perspective, it seems reasonable to suppose that the businesses that generate the greatest economic benefits in terms of revenue, jobs and tax receipts, are those which have achieved sufficient commercial success to achieve a positive exit.

If the number of investments which do not result in successful exits is low then it is arguable whether any significant economic benefits have been generated from the process. This, in turn, would call into question the effectiveness of tax incentives. Another reason why the lack of successful and timely exits should be a concern of policy makers relates to the growing popularity of co-investment funds which typically invest alongside angels and angel groups as a financial engineering tool.⁵¹ These funds, including the Scottish Co-Investment Fund and the Business Angel Co-Investment Fund for England and Wales, are set up as evergreen funds and so require a regular stream of successful exits to continue.

It is not immediately obvious how policy-makers might increase liquidity in the market. Private sector attempts to create secondary markets for angel investments have generally failed to get off the ground (including one attempt in Scotland). Experience elsewhere of creating public sector secondary buy-out funds have also been unfavourable. However, a partial response might be to educate the market by enabling investors to learn from the limited experience available on how companies can be prepared and supported more effectively better for their journey from start-up to exit.

48. Wiltbank, *op. cit.*

49. Mason and Harrison [2002] *op. cit.*

50. Smith, D J, Harrison, R T and Mason, C M (2010) Experience, heuristics and learning: the angel investment process, *Frontiers of Entrepreneurship Research 2010*, Babson College.

51. OECD (2011) *Financing High Growth Firms: The Role of Angel Investors*, Paris: OECD Publishing. <http://dx.doi.org/10.1797/9789264118782-en>, pp 107-116.

Exit routes

As noted above, an exit is an essential feature of risk capital investing. Although the IPO is often discussed in the context of investments it has always been the exception rather than the rule, restricted to the most successful investments. The majority of exits by VCFs and the vast majority of exits by business angels are via an acquisition by an established business. There has been a dramatic reduction in the number of VC-backed IPOs in both the US and Europe, which is at least in part a reflection of the general decline in the number of IPOs which in the USA has fallen by 70% since the 1990s. This decline appears to be structural rather than cyclical, with the peak in the number of IPOs occurring in 1997, and so pre-dating both the post-2000 technology crash and the 2002 Sarbanes-Oxley Act which set new or enhanced standards for all public company boards, management and accounting firms. Rather the cause is attributed to an array of regulatory changes intended to advance low-cost trading of shares but having instead the unintended consequence of stripping economic support for the value components needed to support markets, notably high quality investment research. Smaller, hard-to-analyse companies have suffered disproportionately, with the biggest decline occurring in smaller IPOs of \$50m and under.⁵² Meanwhile, there has been a change in the attitude of VCFs, which now routinely expect to sell out to existing companies rather than take their investments public. Business angels, as previously discussed, generally exit by M&A, with this emphasis at the heart of the early exits investment strategy.

All of this creates a dilemma for policy-makers. Intervening to support the risk capital market enables more companies to start and achieve early growth. However, the need by investors to achieve an exit, and the dominance of M&As to achieve an exit, means that this intervention is unlikely to produce 'companies of scale' that are locally-owned and headquartered.

Does this matter? The Report identified examples of global companies that have turned their acquisitions into global 'centres of excellence'. However, many acquisitions have less favourable out-turns for example in terms of head office jobs and functions (which are unlikely to be required), supply chains, and even survival over the medium-to-long term. Indeed, where the motive for acquisition is strategic, with the acquisition being undertaken to acquire assets (such as IP or human capital) the more likely the acquired business is likely to be closed down. And there are some cases where the motive for acquisition is to eliminate a potential competitor with a disruptive technology. On the other hand, profitable exits enable entrepreneurs to 'recycle' their capital gains and experience either in starting new companies or as investors, other insiders with shares in the company can join other young growing companies in senior positions, while investors are able to recycle their investment gains in new investments.⁵³ However, small exits - which dominate in Scotland - limit the scale of recycling that can occur.

52. Weild, D and Kim, E (2009) *A Wake Up Call For America*, Grant Thornton Capital Market Series.

53. For some Scottish examples, see Mason C M and Harrison, R T (2006) After the exit: acquisitions, entrepreneurial recycling and regional economic development, *Regional Studies*, 40, 55-73.

Conclusion

This discussion has sought to put the Scottish risk capital market into a wider context by highlighting changes in both the supply of and demand for venture capital and changes in the organisation of the market. There are three key trends that impact on the Scottish risk capital market. First, there are fewer VCFs, they have less capital under management, and both the number and size of investments have declined. Second, the geography of venture capital investing is changing, both on a global scale with the major US VCFs in particular increasingly looking to invest in China, and at a sub-national scale where venture capital investing is retrenching to core regions, with investment activity in other regions reliant on public sector involvement. Third, as a consequence, angel groups are now the dominant source of risk capital in terms of number of deals.

However, most angel groups only have the financial resources to fund businesses up to a maximum of around £2m, even with the support of the co-investment fund, and the disappearance of the funding escalator means that the majority of their investments will not attract follow-on funding from VCs. This means that angel groups will only invest in companies with limited capital needs but increasingly plan to support them from start-up all the way through to exit. This is likely to discourage investments in sectors with large capital requirements such as drug discovery⁵⁴, and will favour companies aiming to develop IP or software rather than a product-based business. Moreover, it follows that exits – which will be achieved through M&A – will typically be relatively small, creating limited wealth for a limited number of investors and entrepreneurs to be recycled and truncates the amount of learning achieved by the entrepreneurs and top management team.

The examples of PayPal, Excite, Google, and Facebook, while admittedly extreme cases, highlight the effect of growing businesses to a significant size before exiting on the creation of a new class of angel investors and serial entrepreneurs.⁵⁵ It also begs the question: as the motivation for the acquisition is to obtain the IP with obvious implications for the anchoring of activity in Scotland post exit. Of course, some acquisitions have positive outcomes, with the acquired company being converted into a research centre by its new owner. It therefore follows that from a policy perspective there is a need to enhance the capacity of the supply side to make bigger investments. This can be done in several ways.

First, sources of follow-on finance need to be identified for companies that business angels have seeded. This might be through existing later stage funds such as the Business Growth Fund, or by building relationships between any angel groups and VC firms that can overcome the barriers such as the restriction in the EIS on investing in ordinary shares. Another possibility, discussed at the Royal Society of Edinburgh Business Innovation Forum⁵⁶, is the creation of a VCT-style fund dedicated to investing in early stage companies in Scotland, which might be structured in such a way as to provide a secondary market for angel groups to recycle their cash while securing further funding for suitable portfolio companies.

Second, enabling angel groups to establish side-car funds⁵⁷ to invest alongside the group, as occurs in the USA, would also enable angels to make bigger investments. But this would require HM Treasury action to remove the need for EIS funds to be authorised.

54. Angels dare not tread in drug discovery investment, *The Herald*, 19 February 2012. However, Alida Capital does specialise in investing in life sciences.

55. Former PayPal founders and employees are estimated to have gone on to run businesses that are worth \$30bn (*CNN*: Meet the PayPal Mafia, 26 November 2007). Following its IPO Facebook was estimated to have created 850 millionaires, many of whom have started new companies or become angel investors. Early Facebook investors have funded Instagram, Spotify, Flipboard, Asana, Path, Quora and NationBuilder (Bloomberg: Facebook IPO spawns new wave of social media angels, 21 May 2012; S Lacy: Inside the DNA of the Facebook Mafia, *Tech Crunch*, 13 February 2011; Inc: Meet the Facebook Mafia, Inc. July 2012)

56. The Financing of Business Innovation in Scotland (October 2012), Advice Paper 12-10, Royal Society of Edinburgh

57. A side-car fund is a source of commitment capital that invests alongside the angel group. The fund may be organised to invest automatically alongside group investments, or on pre-set investment criteria, or on the discretion of a fund manager. A side car fund may be restricted to group members, giving them an opportunity to achieve diversification, or may be used to attract capital from non-members.

Third, given the small number of Scottish-based VCs, most of whom do not invest exclusively in Scotland, there is a need to 'import' investment from overseas VCs. The pattern in recent years has been for Scotland to secure various one-off investments from foreign VCs. The challenge is to turn these one-off investments into a regular investment flow as well as seeking to attract new investors (including corporate funds), particularly investors which specialise in sectors in which Scotland has strengths. Better profiling and networking of Scottish companies internationally can help. This could be achieved through the establishment of connections with specific foreign investors to create investment pipelines. The investments made by Morningside Ventures of Boston and Hong Kong following an invitation to Scotland by the Scottish Life Sciences Association⁵⁸ provide an excellent example of the effectiveness of this approach. A new initiative by the New Zealand Venture Investment Fund to enter a co-investment partnership with Taiwan's National Development Fund might also be worth exploring.⁵⁹

Meanwhile, on the demand side it may be that the Scottish economy has to adjust to a new environment in which there is simply less risk capital available. This might mean focusing investments on sectors in which companies are able to 'do more with less' and so have reduced capital requirements.

Or it might involve greater focus on business model (as opposed to technology) innovation. The soft-start model used by many technology firms in Cambridge provides a good illustration of a new business models that require less capital. A high proportion of Cambridge's most significant technology companies originated as soft starts – initially focusing on contract R&D. Venture capital was not involved, or came later and as a consequence most have continued to survive as independent companies.⁶⁰

In the final analysis we need to reflect on a comment by Simon Cook, Managing Partner and CEO of London-based DFJ Esprit comments in the Ernst & Young 2012 Global VC Report that "venture capital really only works by itself in certain regions in the USA, where there is the right ecosystem and the critical mass such that success can make up for losses". His emphasis on the 'right ecosystem' underlines the danger of 'silo' policies. Policies to support the risk capital market need to operate in conjunction with other appropriate forms of support for high growth companies. They cannot be designed and delivered independently. Specifically, there is the issue of what has been termed 'absorptive capacity'. In other words, does Scotland have sufficient companies that can make good use of risk capital? Planys⁶¹ has made a powerful argument that Scottish technology firms have deficiencies in commercial skills. More generally, Scotland has a shortage of managers with experience in fast growing businesses. These are structural issues created by the character of the Scottish economy.

It has also been questioned whether Scotland, through its strong policy emphasis on support for research, IP protection and university commercialisation, is focusing on 'the wrong technologies'. One experienced banker observed that Scotland tends to focus on interesting technologies with small markets whereas somewhere like Cambridge focuses on more mundane technologies that have big markets.⁶² And are the wrong types of entrepreneurs being supported? In the recent studies of Scotland's high growth firms and technology firms it was striking that around 20% were MBOs, MBIs or EBIs.⁶³ Moreover, it is well established that smaller MBOs produce the best returns for investors. Many managers may never have considered an MBO or do not know how to go about it. Many of those who successfully completed an MBO reported how difficult it was.

58. Innovation and Ingenuity, *Scottish Business Insider*, March 2012, pp 21-22.

59. Press release dated 17th October 2012. Available at <http://livemail.livelihoodconnect.com/download/files/40253/1599777/Press%20release%20-%20NZVIF-NDF%20Oct%202012.pdf>

60. Connell, D and Probert, J [2010] *Exploding the Myths of UK Innovation Policy: How 'soft' companies and R&D contracts for customers drive the growth of the Hi-tech economy*, University of Cambridge: Centre for Business Research

61. Planys [2010] Somehow a Miracle Happens: why a lack of commercial capabilities in Scotland ensures continued inability to create indigenous companies of scale: a discussion document. <http://www.planys.com/blog/archives/28.html>

62. A comment that was made by one of the participants at the Access To Finance conference at the University of Strathclyde, 14th September 2012

63. Mason and Brown [2010] and [2012] *op. cit.*



Accordingly, it might be appropriate for policy-makers to consider establishing some kind of MBO school as a means of stimulating interest in MBOs alongside a dedicated Scottish MBO fund. However, there are many managers with the skills to run their own business but for various reasons are unable to undertake an MBO. Thus, an alternative approach, developed by Enterprise Ventures (EV) in North West England with JEREMIE funding, is to encourage management break-outs.⁶⁴ These are defined as individual managers or management teams with a deep understanding of their industry and a track record of running a business successfully for someone else, who want to start their own business, perhaps because their ambitions have been stifled or constrained by the group management. EV's approach is to invest up to £2m alongside co-investors. Here again this approach is consistent with research evidence that corporate spin-offs are more successful than university spin-offs.⁶⁵

In summary, risk capital is a key element in a vibrant entrepreneurial eco-system, a necessary but not sufficient condition to create a thriving entrepreneur-led economy. However, policy-makers face a 'chicken and egg' situation. Risk capital is required to stimulate entrepreneurial activity, but once entrepreneurial activity reaches a certain level it becomes self-sustaining – new firms spin-out from existing companies, successful exits attract new investors and enable entrepreneurial recycling. Their challenge is how to kick start and then maintain this virtuous circle.


64. <http://www.evgroup.uk.com/management-break-outs.aspx>

65. Wenneker, K, Wiklund, J and Wright, M (2012) The effectiveness of university knowledge spill-overs: performance differences between university spin-offs and corporate spin-offs. The Ratio Institute, Stockholm.

Appendices

Appendix 1: Glossary of key terms

Term	Definition
Angels	Private individuals who invest their own capital either alone or part of a syndicate, and who personally own the equity they purchase.
Angel syndicates	Networks of business angel investors, who combine their investments in a company. Also referred to as angel groups.
Deal	The transaction between an individual investor and a company, which may be standalone or part of an investment involving other investors.
DMET	digital media and enabling technologies
DM	digital media, including games, publishing, broadcasting, and in general 'creative digital' such as mobile apps and social networking websites
EIS	HM Revenue & Customs' Enterprise Investment Scheme, designed to help smaller higher-risk trading companies to raise finance by offering a range of tax reliefs to investors who purchase new shares in those companies.
ERDF	the European Union's European Regional Development Fund
ET	enabling technologies, including electronics, engineering, materials, and computing and software
Hybrid investor	An investor with all or part public, voluntary, academic or (occasionally) private sector investors with a policy objective in addition to financial return.
Institutional investors	Organisations which invest on behalf of others and offer guidance and advice on investment. These include Venture Capital companies, partnerships, corporations and corporate venture firms, banks and investment trusts.
ICT	information and communications technology
Investment	A discrete purchase of share capital in a company by one or more investors at a given time.
LINC Scotland	The national association for business angels in Scotland, with a membership network of hundreds of investors including those operating individually, many groups and syndicates, and some private offices.
LLP	limited liability partner, an investor in a VC fund, often a large foundation, insurance group, or pension fund, which wishes to include venture capital to the asset classes in which it invests
LS	life sciences
M&A	mergers and acquisitions, including the sale of one company to another
New investment	The first significant external equity investment in a company, excluding early small scale investment by founders, friends, and family.



Others	The category 'others' refers to individual investors who are not part of an angel group (and are not 'founders, family, or friends'), but also includes investors whose identity it has not been possible to determine.
Public	Public sector investments include those by the Scottish Investment Bank funds and by Highlands and Islands Enterprise.
SCF	The Scottish Investment Bank's Scottish Co-investment Fund
SE	Scottish Enterprise
SEIS	Seed Enterprise Investment Scheme, a special extension of the EIS (see above) to encourage investment in companies at the start-up stage
SIB	Scottish Investment Bank, a division of Scottish Enterprise that provides investment funds to support company growth in Scotland.
Spinout	An organisation that started life within an academic or other research institution and is now an independent trading company, typically with a university shareholding. A spinout company can take assets, intellectual property, technology, and/or existing products from the parent organisation.
SSF	The Scottish Investment Bank's Scottish Seed Fund
SVF	The Scottish Investment Bank's Scottish Venture Fund
Syndication	Investment by two or more groups or firms, investing under the same terms and conditions in order to increase the total deal size.
VC	Venture capital
VCF	Venture capital firm, specialist investors who invest on behalf of others. Typically, VCs are investing funds with a specified time scale, often ten years, within which they aim to generate returns on the investments of the fund's LLP (limited liability partner) stakeholders.



Appendix 2: Definitions and exceptions

This report covers equity investments by independent third party investors, and excludes investments by founders and management, and investments in the form of convertible loans (which are only included if converted into equity) or other debt. Convertible loans are included at the date of conversion into shares.

Although MBO/MBI activity is generally omitted from the figures in this series of Reports, the following exceptional investments have been included in the deals list, in respect of the investment allocated to growth:

Amor Group

£21.8 million - May 2009

Amor Group was formed in May 2009 to acquire the Real Time and Pragma businesses from Sword Group. The investment was made by Growth Capital Partners and the Scottish Venture Fund, with debt funding from Clydesdale Bank.

Glacier Energy Services

£5 million - March 2011

Maven Capital Partners and Simmons Parallel Energy invested in this newly formed oil & gas services company founded through the acquisition of two divisions of MB Aerospace (Roberts pipeline machining technologies, and WellClad specialist welding services), with the Clydesdale Bank providing £3.5 million in finance.

Electro-Flow Controls

£6 million - December 2009

Maven Capital Partners alongside Simmons Parallel Energy Fund backed a management buy-in at Aberdeen-based specialist controls business Electro-Flow Controls, with the Clydesdale Bank providing banking facilities.

Appendix 3: Methodology

Stage 1: Data collection

Companies

The project started with the compilation of a list of known investment deals over the period 2009-2011. This data was prepared from deals listings from YCF, LINC Scotland, and the Scottish Investment Bank. The resulting list of companies was supplemented by those which are similar in origin or nature, but were not known to have secured investment. This included companies from the previous Risk Capital Market reports and previous YCF deals listings, winners of SMART awards, presenters at pitching events such as Connect Scotland and Informatics Ventures' EIE, tenants of science parks and incubators, and Scottish companies supported by NESTA, the Technology Strategy Board, and other relevant early stage support organisations. All of these companies (approximately 900 in all) were approached, by telephone and email, to establish if they had secured external investments which were not on the first list.

The Companies House database was also checked for all these companies, to establish the dates of any returns indicating the issue or allotment of shares.

In previous reports in this series, researchers were able to use Companies House 88(2) returns, which gave not only the date and number of new shares issued, and in most cases the price, but also the identities of the investors. The new form which has replaced the 88(2) is a return for the allotment of shares, SH01, which gives the date, number, and price of share allotments but does not indicate the identity of the investor(s). This meant that the identity of investors in a deal had to be researched from other sources (web searches, and in some cases direct contact with investees). SH01 forms were used to verify the actual amount of investments, and took precedence over other information sources; frequently this meant using a lower value for an investment than that reported in press releases or other deal reports.

Investors

In addition to checking the investments made by those investing organisations included in the SIB, LINC, and YCF lists, other key early stage investors were researched to establish whether or not they had made investments in Scotland in 2009-2011. Some 80 investors were identified; 56 of these had made investments in Scottish companies during the period covered by the survey, and 19 confirmed that they had not. We were unable to get responses from the remainder.

Stage 2: Consultation

In parallel with the quantitative research for this report, a series of consultation interviews was held to build an understanding of the dynamics and future trends of investment in the sector. 37 individuals were interviewed across the whole range of participants in this sector – investors (17), entrepreneurs (6), non-executive directors representing several young companies (3), intermediaries (5), universities (2), and senior Scottish Enterprise staff (4).

This was followed by a half-day workshop on 22nd February, with 14 invited participants, at which the draft findings of the research were presented and discussed.

Appendix 4: Investors by type and location

The following investors all made investments in Scottish companies in the period 2009-2011.

Angel groups

Individual investors were allocated to regions where known, otherwise grouped with 'Others'

Scotland

East	Alida Capital, Archangel Informal Investment, Capital Angels, Daedalus, Equity Gap, Melville, Murray Capital, Par Equity, Rutland Square Partnership
West	Barwell plc, Hamilton Portfolio, Kelvin Capital
South	TRI Capital, Jeanfield
Tayside	Braveheart Investments, Discovery Investment Fund, Innova Partnerships, Kapital Assets, ESM Investments, Souter Investments
Aberdeen	Aurora, Grampian BioPartners, Stacey Ventures
Highlands & Islands	Highland VC
Other UK	Beer & Partners

VCs and institutional investors

Scotland

East	Frontier IP, Old College Capital, Sigma Capital
West	Carswell Securities, Panoramic Growth Equity, Pentech, SEP, STV Group, Upstarts
Tayside	Alliance Trust, DC Thomson, SSE Venture Capital
Other UK	Albion Ventures, Amadeus, Cancer Research, ED Capital, Elsingham Investment, Evolve Capital, Foresight, Growth Capital Partners, Imprimatur Capital, Innotec/Anglo Scientific, Intelligent Energy, IP Group, IQ Capital, Longbow Capital, Low Carbon Accelerator, NBGI Ventures, NCB Corporate Finance, Octopus Ventures, Piton Capital, Seraphim Capital, Tate & Lyle Ventures, Torch Partners, TT International
Outside UK	ABB Technology Ventures, ACT Venture Capital, Andromeda Capital, Aescap Venture Management, Aloe Private Equity, Alstom, ASFM Beteiligungs AG, bieMEDIA, Delta Partners, Elephant Capital, Energy Ventures, Herald Ventures, Lime Rock Partners, Logispring, Morningside Group, NCB Corporate Finance, Palo Alto Investments, SET Venture Partners, Shell Technology Ventures/Kenda Capital, Siemens Technology Accelerator, Simmons Parallel Energy, SM Trust, Sofinnova, Thales, TT International



Acknowledgments

We acknowledge with thanks the contributions of the following individuals and organisations to the research and analysis undertaken for this report.

Researchers: John Archibald, Sophie Archibald, Russell Matthews, and Lisa Massie

Salient Point, who conducted the majority of the consultation interviews, and prepared and presented the subsequent workshop.

Professor Richard Harrison of Queen's University Belfast, who presented an initial analysis of the findings of the Report at the workshop in Edinburgh.

Joan Gordon and Bob Lawrie of the Scottish Investment Bank.

Interviewees, workshop participants, and respondents:

Airborne Energy, Amadeus Capital Partners, Archangel Informal Investment, Ascendant, Aurora Private Equity, Barwell PLC, Bill Buckie, Braveheart Ventures Limited, Cascade Technologies, Chrysalix SET, Company Creators, David Campbell, Delta Partners, Design LED, Discovery Investment Fund, Emerald Technology Ventures, Energy Capital Management, European Policies Research Centre, FanDuel (HubDub), Grampian BioPartners, Highland Venture Capital, Hunter Centre for Entrepreneurship, Imperial Innovations, Innovation Centres (Scotland), IP Group, Jim Reid, Johnston Carmichael, Kelvin Capital, LINC Scotland, Macdonald Henderson, MBM Commercial, NESTA, Octopus Ventures, Old College Capital, Par Equity, PowerPhotonics, Rob McKean, Salient Point, Scottish Enterprise, Sensewhere (SATSIS), SEP, Siemens Technology Accelerator, SSE Venture Capital, Strathclyde University Incubator, TRI Cap, University of Edinburgh, University of Strathclyde, UWI Technology



Authors

Jonathan Harris

Editor, Young Company Finance

Jonathan Harris is editor of Young Company Finance (www.ycfscotland.co.uk), a monthly publication which tracks and reports on the progress of early stage high growth companies in Scotland, from start-up or spin-out to maturity, with special reference to how they finance their development. Since it started in 1998, YCF has given detailed reports of over 1,000 investment deals, together with news and features about investors, major grants, funding initiatives, business awards, company pitches, and analysis and comment on the sector.


Since February 2011, the operations of YCF Scotland have been licensed to LINC Scotland, the national business angel association. Outside Scotland, YCF initiated and runs the PraxisUnico Spinouts UK Survey, an online database of all spinouts and start-ups since 2000 from universities across the UK (www.spinoutsuk.co.uk).

Professor Colin Mason

Professor of Entrepreneurship, Adam Smith Business School, University of Glasgow

Colin Mason is Professor of Entrepreneurship in the Adam Smith Business School at the University of Glasgow, having served in the same role in the Hunter Centre for Entrepreneurship at the University of Strathclyde from October 2001 to September 2012. Prior to this Colin was Professor of Economic Geography in the Department of Geography at the University of Southampton. He has an MA (Hons) in Geography and Economic History from the University of Edinburgh and a PhD in Geography from the University of Manchester. He has also held a number of short-term visiting positions in universities in Canada, Australia and New Zealand and has also taught for many years on a Masters Degree on Small and Medium Sized Enterprises at the Universidad Nacional General Sarmiento, Argentina.

Professor Mason has published extensively on topics such as the new firm formation process, the geography of new firm formation and growth, the impact of small business policy, and entrepreneurial finance. Over the past twenty years his main research has been concerned with the availability of venture capital for entrepreneurial businesses. He is founder and co-editor of *Venture Capital: An International Journal of Entrepreneurial Finance* (Routledge) and has recently been appointed as consulting editor for the *International Small Business Journal* (Sage). He also serves on the editorial boards of five entrepreneurship/small business journals.



This report was prepared for Scottish Enterprise
by Young Company Finance

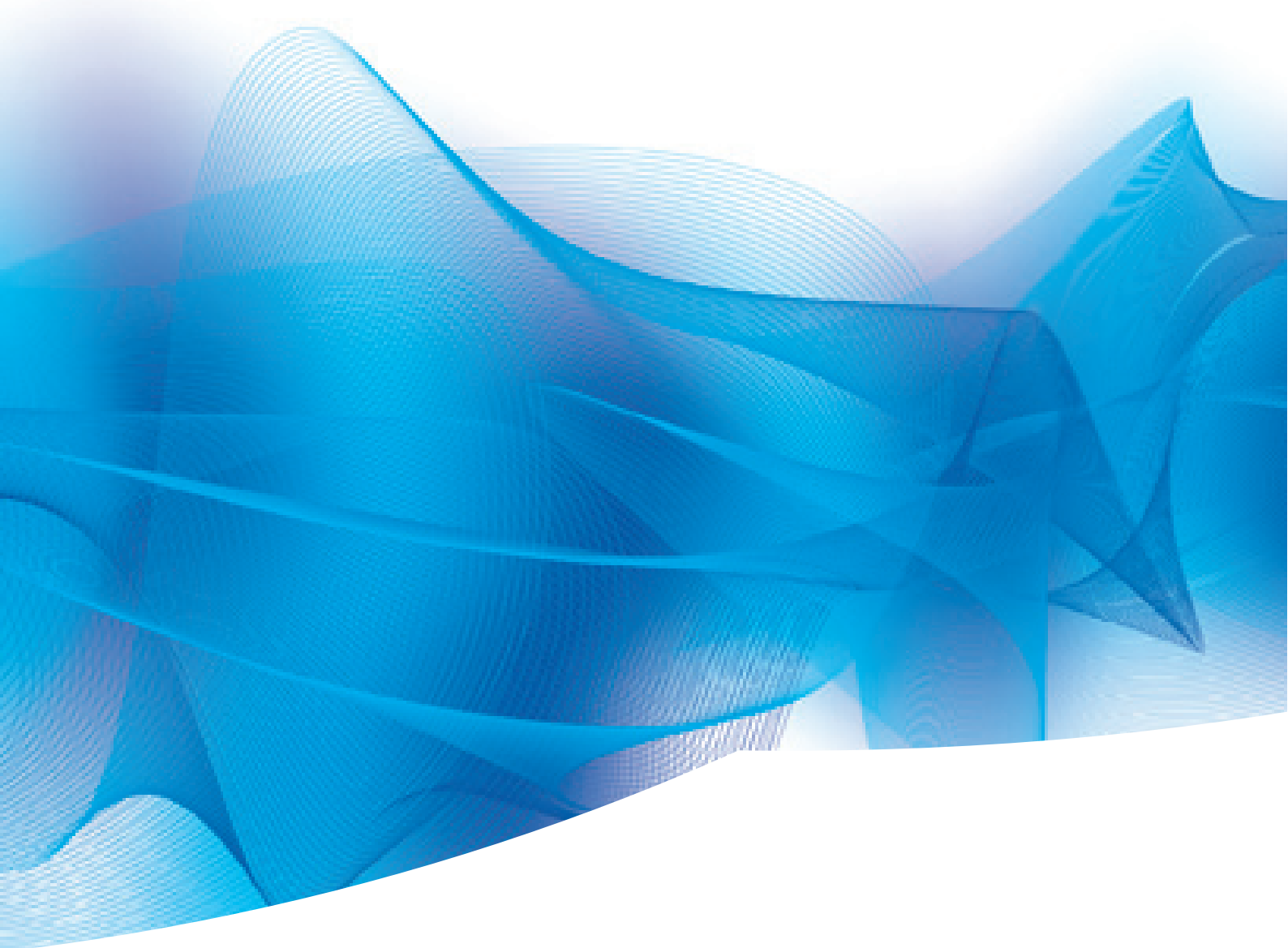
www.ycfscotland.co.uk

Young Company Finance is the trading name of
Edinburgh House Publishing Ltd,
8 Oxford Terrace,
Edinburgh
EH4 1PX

0131 315 4443



Scottish Enterprise
Atrium Court
50 Waterloo Street
Glasgow
G2 6HQ
Helpline:
0845 607 8787
Email:
enquiries@scotent.co.uk
www.scottish-enterprise.com



SIB Scottish
Investment
Bank



EUROPE & SCOTLAND
European Regional Development Fund
Investing in your Future


Scottish Enterprise