Commercialisation Programme Review
Synthesis of Findings

Final Report for

Scottish Enterprise

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Commercialisation Programme Review: Synthesis of Findings

Final Report for Scottish Enterprise

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Executive Summary

Frontline Consultants was commissioned to carry out a review of the Scottish Enterprise Commercialisation Approach. The Approach covers around 18 projects that deliver support to technology based businesses, ranging from investment to intensive support around the development of potential high growth businesses. Projects included the Proof of Concept, ITIs, Enterprise Fellowships, Prospekt, High Growth Start-up Unit, SMART and the Scottish Co-Investment fund amongst others.

The Review of SE's approach was separated into two projects: "Understanding the development journey taken by technology businesses to progress an idea to market". This project did not include beneficiary companies from the ITI programme. The second project was the "Impact Assessment, which included all commercialisation activities, including the ITI outcomes.

In total 1,306 companies engaged with the programme between 2004 and 2008. A minority of companies accessed more than one project within the programme, but most only accessed one intervention. The projects largely focus on technology development, though some also work with companies in taking their products to market. Companies that accessed more than one intervention had a close fit with Scottish Enterprises key sectors, though fit was less clear for those companies who accessed one intervention.

The average company journey from the generation of an idea with commercial potential to a growing business lasts for around five years. The average cost amounted to £1.6 million, less than would be expected in the development of a technology based business. While the objectives of the companies shifted over time, from a technology focus to more commercial objectives, finance remained a barrier in some form across all stages. However, lack of skills (particularly marketing and selling) became an issue as companies moved their product closer to the market. The companies access a range of funding sources including Scottish Enterprise, Scottish Government as well as angel and venture capital investment.

Satisfaction with the programme was high, ranging from how the programme is promoted to the delivery and management of the individual supports. Overall satisfaction compares favourably with that associated with intensive Designated Relationship Management status.

The impact of the programme to date amounted to a peak of 1,769 net additional jobs in 2007 and £115 million of net additional GVA between 2004 and 2007. This amounted to a cost benefit ratio of 1: 1.23. This compared favourably with the impacts achieved by other similar initiatives.

The future impact of the scheme could be substantial, with a peak of 3,424 net additional jobs in 2009 and £419 million of GVA between 2008 and 2018. This could amounts to a cost benefit ratio of 1: 5.88 representing a more positive impact in relation to other schemes. This impact was driven by a small number of firms generating a large impact, with the majority of firms contributing only a modest amount to the overall impact.

The programme was well regarded by businesses and has generated a positive return to date, with the potential for a greater and more substantial impact over time.

Scottish Enterprise have used the findings from the working papers, as well as other wider work in the commercialisation space to introduce a new approach to commercialisation including engagements with a smaller number of companies with greater potential, greater alignment of activities and a clearer focus on line of sight to market.

1 Introduction

If the purpose of government is to grow the economy and Scottish Enterprise to drive enterprise, innovation and investment, then commercialisation is a major contributor to this agenda. If one 'superstar' company with roots in Scotland can make a disproportionate impact on the economy, then the key is providing support that enables this to happen.

Frontline was commissioned to gain a better understanding of this area, by looking at the company journey (the process of company creation and development) and how impact builds up, rather than just the destination of companies and impact achieved. This covered both company development, and in some cases product development within more established businesses. The review looked at what companies, or pre-incorporated entities, do when taking an idea with commercial potential to the market, breaking the process down into a series of stages and evidencing key objectives, supports, finance and its use and barriers to ongoing development.

As this work was based on the experiences of companies who had engaged with Scottish Enterprise the findings may not be representative of all companies who make this journey.

2 Method

This section outlines the study method; background to the Branscomb model used to understand company growth and definition of the projects that make up the commercialisation programme.

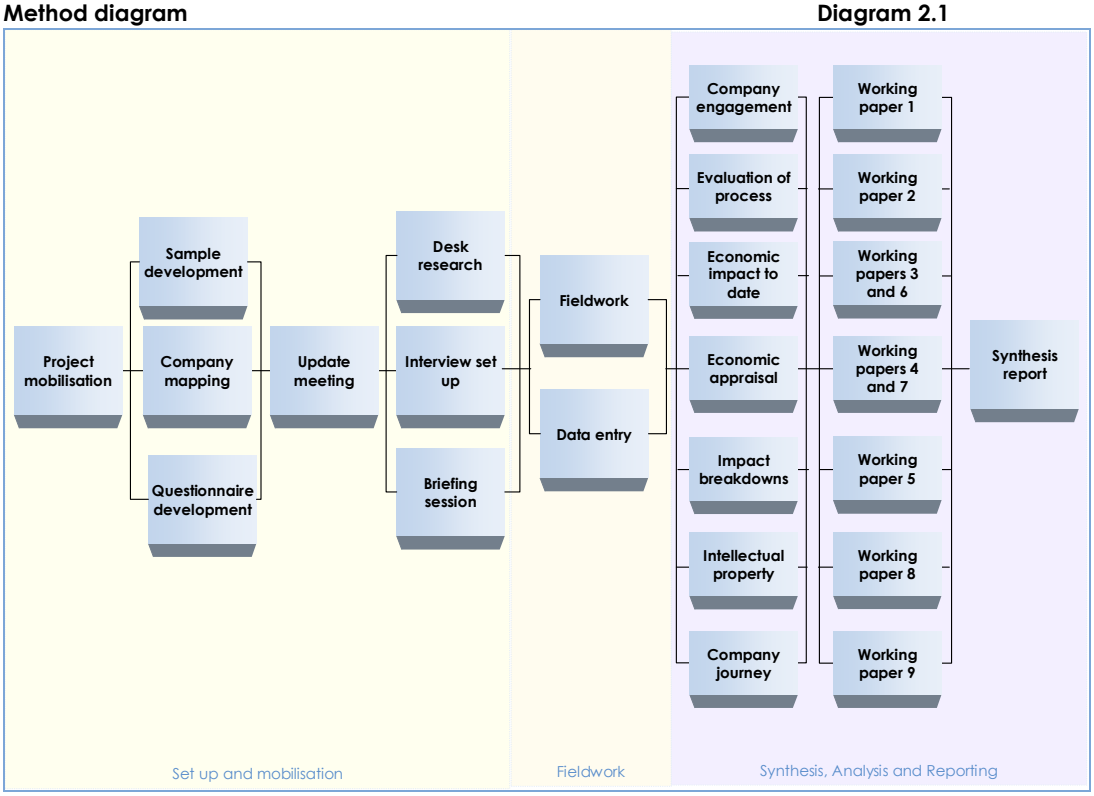
2.1 Method

Frontline's approach to this work focused on developing robust research, evaluation and impact assessment that met best practice guidance in the HM Treasury Green Book, SE Economic Impact Assessment Guidance and Frontline's own evaluation as learning approach.

Our method covered a broad package of work, resulting in the production of nine working papers, as outlined in Diagram 2.1. In addition, Frontline was commissioned to carry out an impact assessment and appraisal of the companies who have purchased a license from the ITIs. While the work was done separately, it used the same time period and question set for understanding impact and was therefore included in the impact assessment. ITI companies were not asked the wider questions around the development journey of technology companies. This meant that there were two elements to the work:

- "Understanding the development journey taken by technology businesses to progress an idea to market" (excluding the companies who own an ITI license)
- impact (including the companies who own an ITI license)

Method diagram **Diagram 2.1**



The main elements of work included:

- a mapping exercise of companies accessing the projects that make up the commercialisation programme

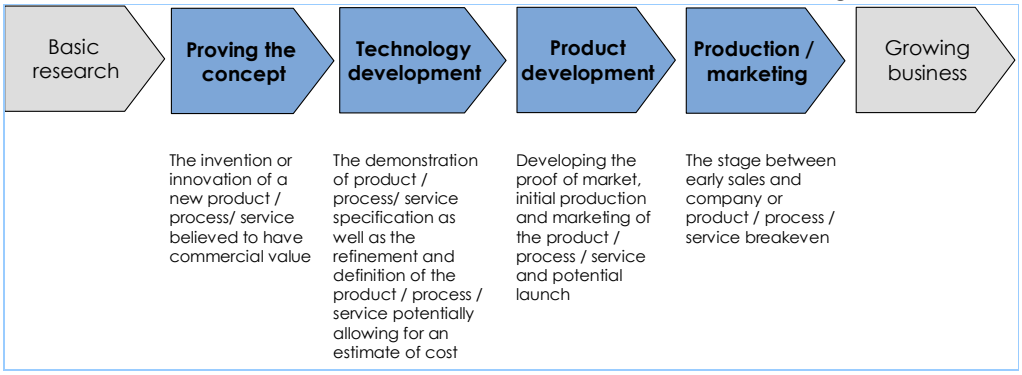
- a survey of 100 companies who had accessed the projects that make up the commercialisation programme (plus eight interviews with companies purchasing a license from the ITIs)
- analysis of the secondary data held on the programme as well as the primary data collected from the survey

This synthesis report brings together the findings of the work and draws out the key messages in a single summary document. Where major sectoral differences (between enabling technology and life science companies[1]) emerge these are drawn out in the text.

2.2 The Branscomb model

In order to develop a deeper and consistent understanding of the companies (and pre-incorporated entities) who have engaged with the commercialisation programme the 'Branscomb Model' was used. This approach mapped the broad stages of company development from basic research to a growing business through four broad stages[2] as outlined below.

The Branscomb model **Diagram 2.2**



While it was understood that the company journey was not linear or easily phased, the Branscomb Model was used to provide consistency of assessment across companies.

2.3 The commercialisation approach

The evaluation covered a range of projects that can be defined as Scottish Enterprise's commercialisation approach. These are summarised in Table 2.1.

The projects that make up the commercialisation programme **Table 2.1**

Projects	
Intermediate Technology Institutes (ITIs) [3]	Small Company Innovation Scheme (SCIS)
Proof of Concept (PoC)	SMART
Enterprise Fellowships	Edinburgh Pre Incubation Scheme (EPIS)
Industry Fellowships	Otocap
High Growth Start-up Unit (HGSU)	Commercialisation Breakthrough
SPUR	Edinburgh Stanford Link
Prospekt	Scottish Co-Investment Fund (SCIF)
Technology Gateway	Scottish SEED Fund
Commercialisation Toolkit	Scottish Venture Fund

[1] There were not enough energy companies in the completed survey to draw out any meaningful comparisons

[2] Branscomb.L, Auerswald.P (2002) *Between Invention and Innovation, An Analysis of Funding for Early Stage Technology Development*, Advanced Technology Programme

[3] The ITIs were not included in the "Understanding the development journey taken by technology businesses to progress an idea to market" work

3 Company Engagement with the Commercialisation Approach

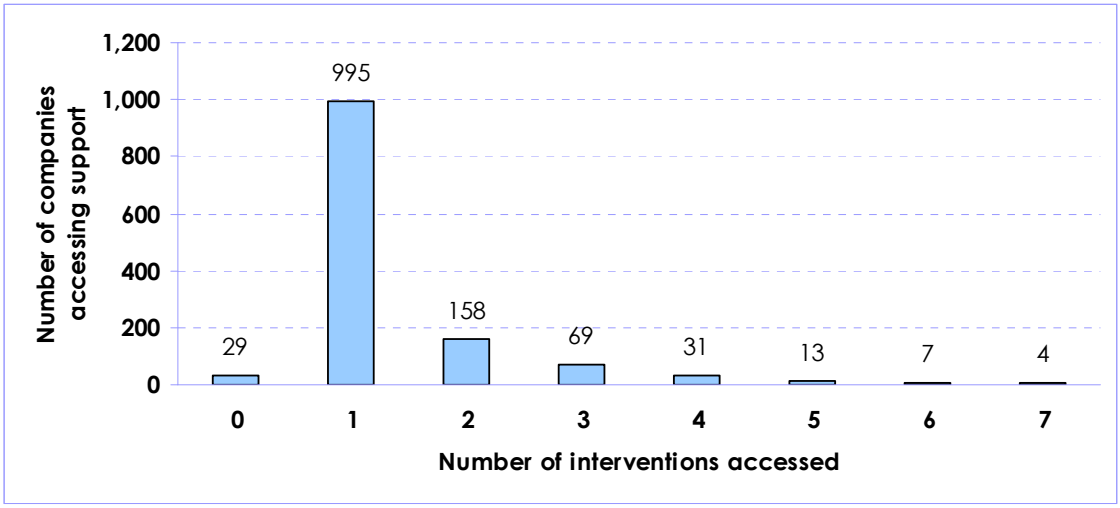
This section outlines how many companies have engaged with the commercialisation programme and who they were. This section does not include responses from ITI licensee companies.

3.1 Number of companies and engagements

The Scottish Enterprise Commercialisation approach provides an array of support mechanisms to a wide range and number of companies. The mapping exercise indicated that 1,306 different companies had engaged with commercialisation activities between 2004 and 2008. As a small number of companies had engaged with more than one project, 1,777 company interactions occurred.

The vast majority of companies (995, or 66%) accessed one project, with 55 companies accessing four or more interventions as outlined in Chart 3.1.

Number of interventions by companies **Chart 3.1**



Note: the 0 intervention companies represent spin outs claimed by Scottish Enterprise between 2004-2008 who had not accessed any further commercialisation programme support

3.2 Projects accessed

The main projects accessed by companies included:

- the Small Company Innovation Scheme, accessed by 386 companies
- the Edinburgh Stanford Link, accessed by 262 companies or pre-incorporated entities
- the Scottish Government SMART scheme, accessed by 224 companies

These three projects accounted for almost 50% of the interventions and focused on a 'one to many' system of support, particularly through the seminars and events associated with the Edinburgh Stanford Link project. The more intensive one to one interventions only supported a smaller number of companies. Between 2004 and 2008:

- the High Growth Start Up Unit (HGSU) provided support to 66 companies or pre-incorporated entities
- the Proof of Concept (POC) programme provided support to 42 companies or pre-incorporated entities

The projects were largely focused on technology development.

3.3 Commercialisation company characteristics

Of the 1,300 companies accessing the programme over half (53%) did not fit within any of the Scottish Enterprise priority sectors[4]. This was a higher proportion than amongst the 100 surveyed firms (46% not classified to a particular sector). This was less the case for multiple intervention companies. The remainder included:

- 26% of companies classified as electronic market firms (compared with 29% amongst the 100 surveyed firms)
- 15% of companies classified as life science firms (against 20% in the 100 surveyed firms)
- 3% of companies classified as chemicals firms (against 2% in the 100 surveyed firms)
- 3% of companies classified as energy firms (the same proportion as amongst the 100 surveyed firms)

Of the 100 companies surveyed, these were mainly:

- private limited (95%)
- trading for over three years (64%)
- small businesses, in effect employing less than 50 staff (94%)
- focused on enabling technologies (63%)
- covering a range of the Branscomb stages – with 34% at the growing business stage, and a further 25% at the production marketing stage

While this provides an overview of the broad characteristics of the companies, they were not a homogenous group.

3.4 Experience of company management teams

The company management teams had a wide range of previous business experience, including:

- general business experience, eg having previously started a business (74%) or managed a business in the past (67%)
- innovation specific experience, eg experience of invention or innovation (65%) and developing a market for a new invention or innovation (64%)

A smaller proportion of the company management teams had accessed training, including:

- general business training, eg management/training advice (38%) or start up advice/training (35%)
- innovation specific training, eg IP protection (21%) and developing prototypes for new inventions or innovation (19%)

3.5 Summary

The key messages arising from the company engagement with the programme were:

- a large number of companies have engaged with the Scottish Enterprise commercialisation programme – though most access one project suggesting few linkages or flows across the programme
- company engagement with the programme largely focuses on technology development as opposed to wider business development

[4] Based on the Standard Industrial Classification Code (SIC) for the 500 companies (from 1,300) for which a code was available mapped against the codes that define the Scottish Enterprise priority sectors

- a small number of companies who engaged with the programme fit with the SE priority sectors – while the fit for the majority is less clear

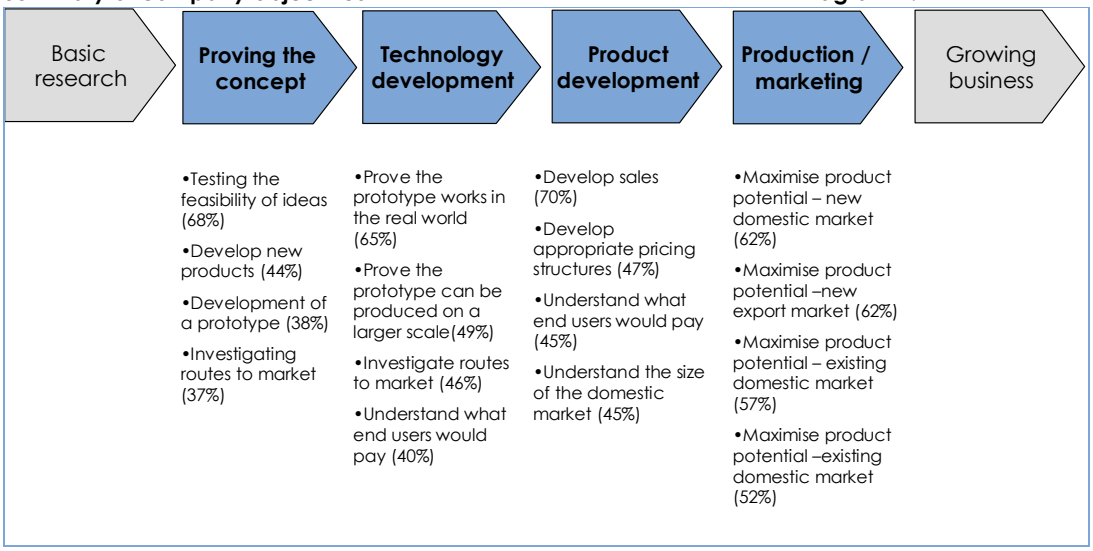
4 The Branscomb Company Journey

This section outlines the company journey, focusing on the key issues faced in company development and growth and outlines the percentage of companies providing each response. This section does not include responses from ITI licensee companies.

4.1 Company objectives

The top four company objectives at each stage are summarised in Diagram 4.1.

Summary of company objectives **Diagram 4.1**



There were a number of sectoral differences:

- enabling technology businesses had a greater focus on understanding what end users would pay at the technology development stage and routes to market at the product development stage
- life sciences firms had a greater focus on research findings and accessing venture capital/angel investment funding at the proving the concept stage, a lower focus on investigating routes to market and developing sales at the technology development stage, a lower focus on understanding the domestic and export market at the product development stage and a lower focus on maximising existing and new domestic sales at the production/marketing phase

Overall, the objectives show a strong transition from technical objectives in the proving the concept and technology development stages to more commercial activities centred on sales in the product development and production/marketing stages.

The Scottish Enterprise company building paper[5] suggested that there were a number of critical tasks needed in the development of early stage firms, including:

- entrepreneurial team development
- proof of product
- investment and funding
- route to market

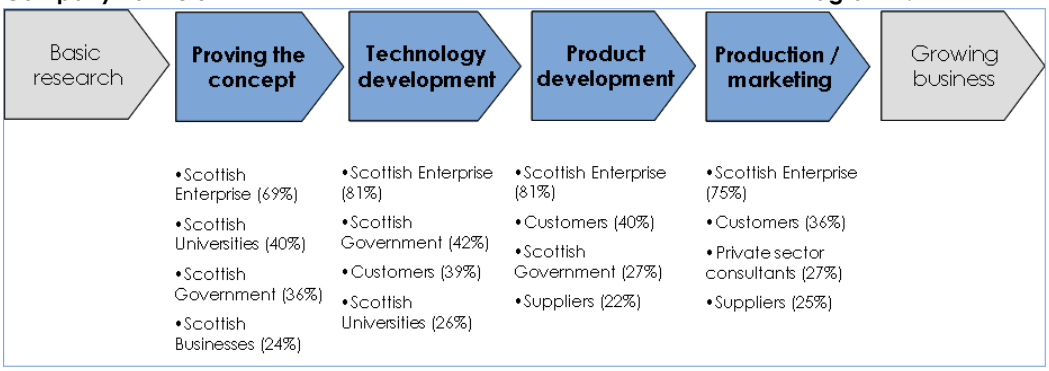
[5] Scottish Enterprise (2008) *Company Building: Supporting Fast Growth Technology Based Businesses*, Innovation and Commercialisation Directorate

Each of these factors show a degree of consistency with the objectives of the businesses surveyed across the Branscomb stages. It therefore highlighted the broad range of tasks, and therefore skillsets, the companies needed in order to develop a growing business.

4.2 Who the companies work with

The top four organisations the companies worked with at each stage are summarised in Diagram 4.2.

Company Partners **Diagram 4.2**



There were a number of sectoral differences:

- enabling technology businesses engaged less with universities at the proving the concept, technology development and product development stages
- life sciences firms engaged more with universities across each of the stages

The company partners are broadly consistency across each of the Branscomb stages. Scottish Enterprise was used by the majority of companies at each stage (to be expected given the firms have accessed at least one commercialisation project). The role of customers peaked during the product development stage, whereas supplier involvement was higher during the production/marketing phase. Not surprisingly, Scottish university involvement peaked during the proving the concept stage and tailed off during the technology development stage.

In addition to the main partners in company development, there was a wide range of organisations who worked with a small number of the companies at the various stages. These included the ITIs, other UK public sector organisations, (such as the Technology Strategy Board), EU departments as well as private R&D companies and consultants.

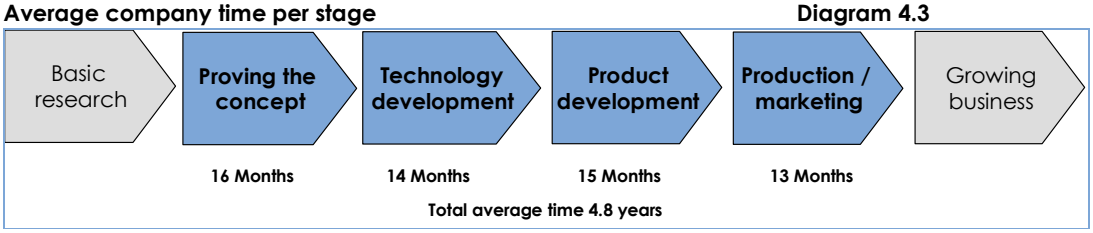
When assessed against the main players in the Scottish innovation system[6] it is apparent that a large proportion of the activity has taken place with a small number of players. This suggested that it is less of a system and more a collection of organisations that operate in the commercialisation space.

4.3 Time

The average time per stage is outlined in Diagram 4.3 and amounted to a total time period of almost five years from idea generation to entering the market.

[6] Roper.S, Love.J, Cooke.P and Clifton.N (2006) *The Scottish Innovation System, Actors, Roles and Actions*, Scottish Government

Average company time per stage **Diagram 4.3**



The Scottish Enterprise company building paper suggested that the time for a business to reach the exploitation stage (broadly equivalent to the growing business stage) amounted to around seven years. This suggests that the companies in the sample, the majority of which had multiple interventions, were developing quicker.

While this represents the average time per company, the findings suggest that for some companies the times were highly variable. For example:

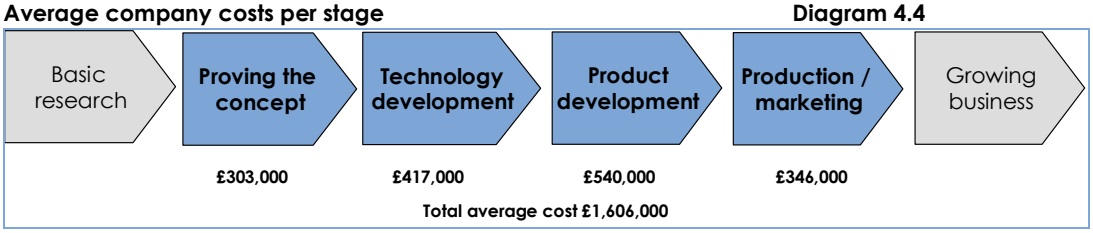
- at the **proving the concept** stage 15% of the companies suggested the stage took less than 6 months to complete, while 18% suggested it took over 2 years
- at the **technology development** stage 7% of companies suggested the stage took less than 6 months to complete, while 11% suggested it took over 2 years
- at the **product development** stage 3% of companies suggested the stage took less than 6 months to complete, while 2% suggested it took over 3 years
- at the **production/marketing** stage12% of companies suggested that the stage took less than 6 months to complete, while 2% suggested it took over 5 years

The implication is that the development of a viable product that is moving into the growing business stage takes time, although there was great variation across stages and companies.

4.4 Costs

The average cost per stage is outlined in Diagram 4.4 and amounted to a total cost of approximately £1.6 million.

Average company costs per stage **Diagram 4.4**



The Scottish Enterprise company building paper suggested that the costs associated with reaching the exploitation stage amounted to around £4.5 million, with the final exploitation stage requiring the greatest levels of investment to scale up delivery and maximise exploitation. This was significantly greater than the companies in the commercialisation sample. This could be because the companies in the sample were cutting costs or were finding more efficient ways of developing the business. Given that access to and scale of finance was cited later as a barrier, it could be that the former was the more likely explanation.

Alternatively, while this represents the average cost per company, the survey findings suggest that for some the costs varied greatly. For example:

- at the **proving the concept** stage 20% of the companies suggested the stage cost less than £50,000, while 10% suggested it took over £1 million

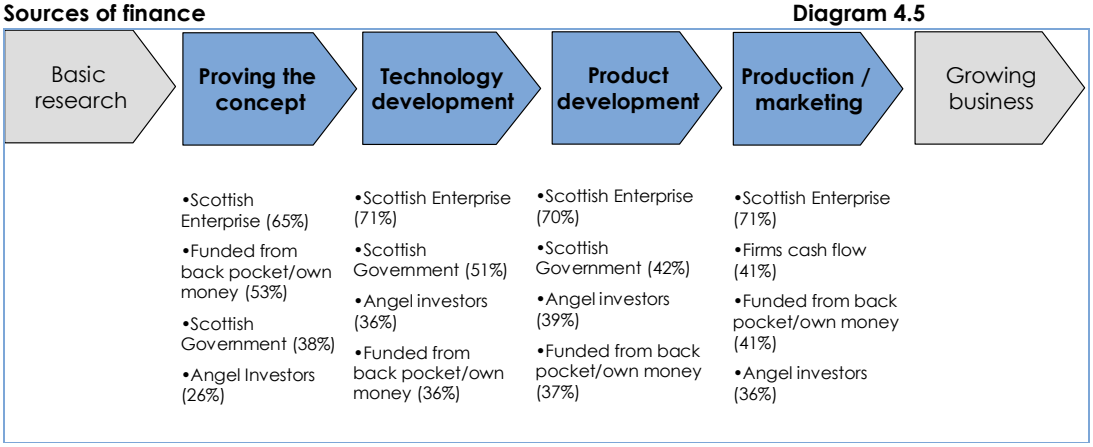
- at the **technology development** stage 13% of companies suggested the stage cost less than £50,000, while 3% suggested it took over £2 million
- at the **product development** stage 11% of companies suggested the stage cost less than £50,000, while 2% suggested it took over £3 million
- at the **production/marketing** stage 22% of companies suggested that the stage cost less than £50,000, while 2% suggested it cost between £2-3 million

The implication was that the development of a viable product can cost around £1.6 million, though again there was great variation across the different companies.

4.5 Source of finance

The top four sources of finance are summarised in the diagram below.

Sources of finance **Diagram 4.5**



There were some differences by sector:

- a greater proportion of enabling technology businesses accessed angel investor finance at the technology development and product development stage and used their own cash flow/profits at the production marketing stage
- a lower proportion of life science firms used their own cash flow/profits at the production/marketing stage

The public sector remains a consistent source of finance for companies across all stages of company development.

Scottish Enterprise and Scottish Government finance accessed by companies was gathered in the company mapping exercise (where available[7]). When the total figure was compared with total company costs it appeared that the public sector contribution amounted to around 20% (largely driven by Scottish Government SMART and SPUR awards). This is unlikely to include any wider or more direct grant support offered to the companies but provided some indication of the scale of public sector funding.

4.6 Use of finance

Finance was used in a variety of ways, including:

- personnel costs, such as salaries, national insurance and pension contributions
- equipment costs, such as purchase of instruments and wider equipment
- overheads

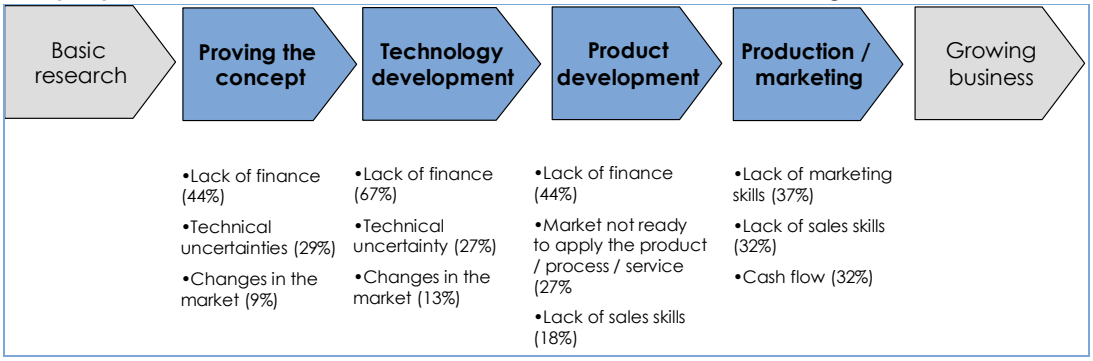
[7] Finance was gathered for SMART, SPUR, Scottish Co-Investment Fund, SEED fund, Venture fund, Business Growth Fund and the Small Company Innovation Scheme

Resources were also used to pay for intellectual property protection. Around 73% of companies held some form of intellectual property protection, including patents, registered domain names, registered company names and registered trademarks. These were held for multiple geographies beyond the UK and EU, with a particular focus on the US.

4.7 Barriers

The top three barriers at each stage are summarised in the Diagram 4.6.

Company Barriers **Diagram 4.6**



There were some differences by sector:

- a higher proportion of enabling technology businesses cited lack of finance at the product development stage
- a lower proportion of life sciences firms cited lack of finance as a barrier at the product development stage, while a greater proportion cited difficulty selling the product and market not ready to apply the product/process/service at the production/marketing stage

Lack of finance covering availability and scale was the main barrier in the early stage – though availability of cash flow in the production/marketing stage suggests that access to finance was a consistent barrier across each of the main stages of company growth.

Finance has consistently been raised as an issue for technology based businesses. For example two recent Scottish Enterprise project evaluations provided evidence around this barrier:

- the evaluation of the Scottish Co Investment Fund[8]: in which 79% of the firms surveyed suggested that accessing capital in Scotland was difficult, very difficult or near impossible
- the Investment Readiness Support Scheme evaluation[9]: in which 71% of the firms surveyed suggested lack of internal finance, 44% lack of debt or loan finance, 38% equity finance and 34% grant finance were barriers that prevented the businesses from pursuing their company objectives

In addition, research[10] carried out by the Department of Trade and Industry (DTI – now UK Department for Business, Innovation and Skills) across the UK suggested that cost factors were the main barrier to innovation:

[8] Hayton Associates and GEN Consulting (2008) *Evaluation of the Scottish Co-Investment Fund*, Scottish Enterprise

[9] PACEC (2007) *Evaluation of the Investment Readiness Support Scheme*, Scottish Enterprise

[10] DTI (2006) *DTI Occasional Paper No.6, Innovation in the UK, Indicators and Insights*, DTI

- excessive perceived economic risks, cited by 13% of businesses as a high barrier
- direct innovation costs to high, cited by 15% of businesses as a high barrier
- cost of finance, cited by 12% of businesses as a high barrier
- availability of finance, cited by 11% of businesses as a high barrier

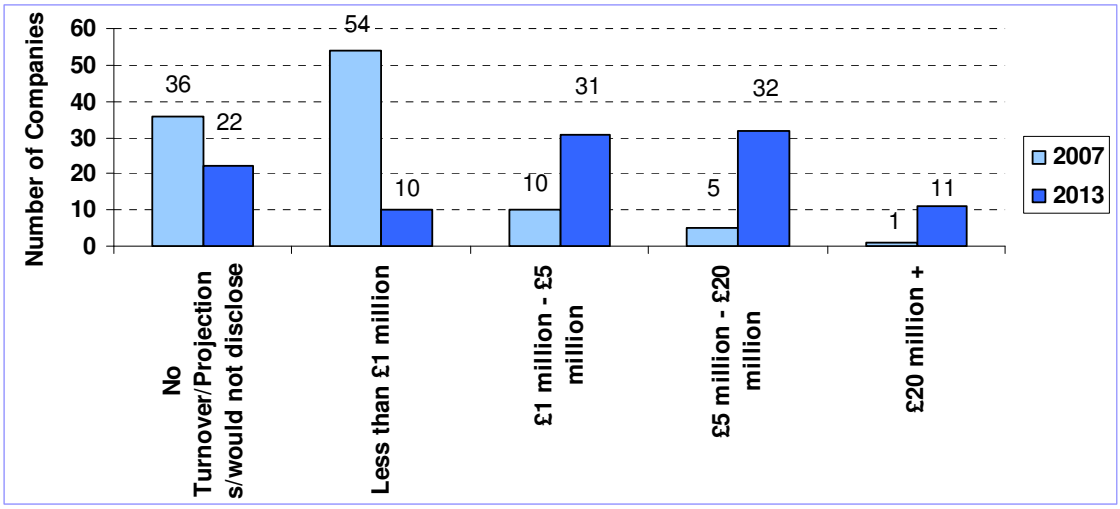
However, there were also wider barriers, including market issues across the stages and skills issues – especially around marketing and selling any new product / process / service in the latter stages.

4.8 Company revenue projections

The companies had set ambitious sales targets relative to their level in 2007. In 2007, six companies had turnover of over £5 million. By 2013 this was projected to rise to 74 companies as outlined in Chart 4.1 below.

Given the timescales, costs and challenges outline above, as well as the 2007 sales figures, this would represent a major shift in the company base.

Company revenue projections **Chart 4.1**



4.9 Summary

The key messages arising from the company journey were:

- the company journey is different for all companies – requiring flexibility to deliver in ways that really meet each companies needs
- it takes time (5 years) and significant resources (£1.6 million plus) for businesses to reach the growing business stage
- companies have ambitious growth plans – though the extent to which these are achievable is questionable
- companies have to develop the whole business (including technology, business model, accessing finance and staff development) – frequently against the reality of constrained finance

5 Rating of Processes and Company Satisfaction

This section outlines satisfaction with the commercialisation programme and how it was delivered. This section does not include responses from ITI licensee companies.

5.1 Promotion of support

At the proving the concept stage the majority of companies found out about support by word of mouth (59%), while in the latter three stages a Scottish Enterprise account manager was the main source. This may be driven by very early stage companies or pre-incorporated entities not having an account manager but gaining one as they start to move through the company development journey and therefore becoming more informed about the Scottish Enterprise offering.

Satisfaction with the promotion of support increased from 57% at the proving the concept stage to 73% at the production/marketing stage.

5.2 Working with Scottish Enterprise

Across all stages the main reason for working with Scottish Enterprise was that the support was appropriate to company needs (around 85% of companies at each stage); in most cases this meant support to access finance.

When not working with Scottish Enterprise, companies suggested that they had been signposted to appropriate support predominately by Scottish Enterprise. In addition, a small but declining minority, suggested that they did not know Scottish Enterprise provided support that would help them meet their objectives at the particular stage. This fell from a third (33%) at the proving the concept stage to one fifth (20%)[11] at the production marketing stage.

This implies that the SE support was meeting company needs, and where they weren't providing support they were signposting companies to others who could provide a service.

5.3 Application and selection

Across all stages the majority of companies (around 60%) rated the application/selection process as either very straightforward or straightforward. By contrast, a fifth suggested that it was either bureaucratic or very bureaucratic.

This suggests that the processes in place for companies to access or be selected for support were working well, with most companies satisfied or very satisfied and few companies dissatisfied.

5.4 Satisfaction with support

Satisfaction with the delivery of support was high. This was consistent across each of the stages for the quality of advice received, communication and project management, including around:

- 84% of companies rating quality of advice as good or very good (across each of the stages)
- 82% of companies rating communication with SE as good or very good (including a high of 90% at the technology development stage)
- 73% of companies rating the quality of project management as good or very good (ranging from 67% at the product development stage to a high of 78% at the production/marketing stage)

[11] By this stage, the sample size reduced to 59 respondents

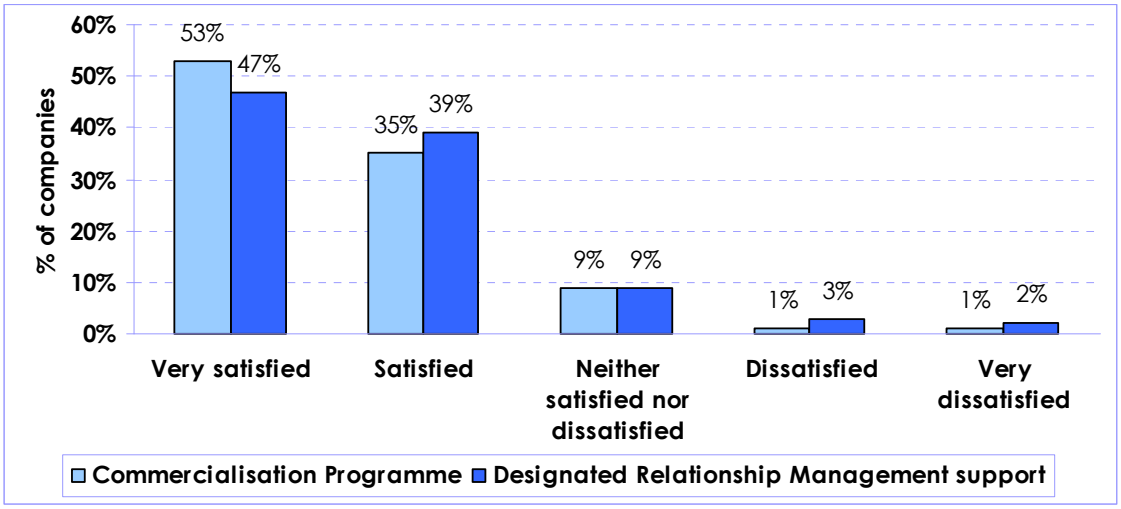
This suggests a high degree of business satisfaction with the way support was delivered, ongoing communication and the management of project delivery.

5.5 Overall satisfaction

Overall satisfaction with the support received was high. In order to put the findings into context a comparison was made between the results from the commercialisation programme and the 2008 evaluation of Designated Relationship Management (DRM) support[12].

Chart 5.1 shows that satisfaction was high across both the programmes, with a higher proportion of commercialisation companies suggesting they were very satisfied with the commercialisation programme than said the same about DRM support.

Overall Satisfaction – Commercialisation Programme and DRM Status **Chart 5.1**



This suggests that the commercialisation programme was well received by companies and was offering a quality service that met the needs of those accessing the support available through it. Given that all the companies accessing the support had very different needs, providing a service that gains high satisfaction indicated that there was sufficient flexibility to ensure it was tailored to the needs of companies.

5.6 Summary

The key messages around company satisfaction were:

- companies suggested support was well promoted across all Branscomb stages
- companies worked with Scottish Enterprise because they felt the support was appropriate to their needs
- overall satisfaction with the programme was high, even when compared with intensive Designated Relationship Management status

[12] Hayton Associates and GEN Consulting (2009) *Economic Impact Evaluation of Scottish Enterprise's Interventions with Account and Client Managed Companies*, Scottish Enterprise

6 Impact Assessment – Impacts to Date

This section outlines the economic impact of the commercialisation programme grossed to the population of 1,306 companies accessing support. The section includes the results from the ITI impact assessment.

6.1 Broad approach to the impact assessment

The approach to economic impact assessment followed best practice guidance as laid out in the Scottish Enterprise Additionality Guidance and the HM Treasury Green Book. The approach involved three broad steps:

- **collection of key impact variables**: this included turnover, employment and GVA (based on turnover less the cost of bought in goods and services). It also included answers to the Scottish Enterprise standard impact question set, which provided responses on deadweight, displacement and leakage (substitution estimated to be zero and multipliers sourced from Scottish Government statistics)
- **adjustment for additionality**: gross impact figures were adjusted for deadweight, displacement, substitution, leakage and multipliers using the intervention options less reference case approach
- **cost benefit analysis**: all net impact figures and costs (converted to 2007 prices) were inputted to the SE cost benefit calculator and discounted at 3.5% per annum as per HM Treasury guidance to arrive at cost benefit ratios for key milestone periods

The table below illustrates the process of taking gross values and adjusting for additionality based on the average values in each year[13]. It should, however, be noted that the calculations used company specific values derived from survey evidence. The averages in Table 6.1 are used for illustrative purposes only[14].

Evaluation Period GVA Additionality Adjustments **Table 6.1**

	2004 (Year 0)	2005 (Year 1)	2006 (Year 2)	2007 (Year 3)
	Gross value	**Gross value**	**Gross value**	**Gross value**
Deadweight	96%	96%	90%	75%
Displacement	4%	4%	4%	4%
Substitution	0%	0%	0%	0%
Leakage	0%	0%	0%	0%
Multipliers	1.68	1.68	1.68	1.68
	Net Impact	**Net Impact**	**Net Impact**	**Net Impact**
Discount 3.5%	1.000	0.9662	0.9335	0.9019
	Net Impact NPV	**Net Impact NPV**	**Net Impact NPV**	**Net Impact NPV**

6.2 Employment impacts

The employment impact of the commercialisation programme reflects both the creation of new jobs and the safeguarding of existing employment.

As the jobs were both created and safeguarded it was not possible to provide a total employment figure across the period, but instead an annual snapshot in each of the years between 2004 and 2007. In total:

[13] Note impact values were calculated on a company by company basis, the values in the table represent the averages across the 100 companies

[14] A full worked example from the GVA additionality sheets for 30 companies in 2007 is included in Appendix 3

- a peak of 1,484 net additional jobs were created or safeguarded as a result of the commercialisation programme in 2007
- a peak of 285 net additional jobs were created or safeguarded as a result of the ITI investment in 2007
- a net additional employment level across the commercial programme and ITIs of 1,769 jobs in 2007

Employment Impact **Table 6.2**

	Commercialisation Programme	ITIs	Total
2004	410	0	**410**
2005	538	0	**538**
2006	793	0	**793**
2007	1,484	285	**1,769**

There was clear evidence of time additionality in relation to employment generation and safeguarding associated with the commercialisation programme. This included:

- 64% of companies who suggested that their 2007 employment level had been brought forward as a result of the commercialisation programme:
  - 24% suggesting it had been brought forward by over 2 years
  - 23% suggesting it had been brought forward by up to 1 year
  - 13% suggesting it has been brought forward by between 1 and 2 years
- 34% of companies who suggested the commercialisation support had made no difference to their 2007 employment level

Employment quality additionality was lower. Over half of the companies (52%) suggested the support had made no difference to the quality of employees or management, though 47% suggested they were either moderately or a lot better.

6.3 GVA impacts

An estimate of impact is the ultimate effect of the commercialisation programme and ITI investment on the economy. This was measured as the net increase in gross value added (GVA) accruing as a direct result of the Scottish Enterprise investment.

In total between 2004 and 2007:

- the net discounted GVA impact of the commercialisation programme amounted to £109.3 million against a discounted cost of £60.7 million; a cost benefit ratio of 1: 1.80
- the net discounted GVA impact of the ITI investment amounted to £6 million against a discounted cost of £33 million; a cost benefit ratio of 1: 0.18
- this amounted to total net discounted GVA of £115 million between 2004 and 2007; a cost benefit ratio of 1: 1.23

The commercialisation programme has generated a return on the initial investment, while the ITI investment has been greater than the GVA benefits realised. When the programmes are combined this amounted to a return of £1.23 for every £1 invested. It should be noted that the cost data only includes direct programme or project costs, it does not include wider staff costs or overheads.

Commercialisation Programme GVA Impact 2004-2007 **Table 6.3**

	Commercialisation Programme	ITIs	Total
Costs (NPV)	£60,688,432	£33,031,625	£93,720,057
GVA (NPV)	£109,291,061	£6,020,183	£115,311,244
Cost Benefit Ratio	**1: 1.80**	**1: 0.18**	**1: 1.23**

There was clear evidence of time additionality in relation to the generation of GVA (proxied from turnover generation). This included:

- 73% of companies who suggested that their 2007 turnover level had been brought forward as a result of the commercialisation programme:
  - 29% suggesting it had been brought forward by up to 1 year
  - 22% suggesting it had been brought forward by over 2 years
  - 15% suggesting it has been brought forward by between 1 and 2 years
- 27% of companies who suggested the commercialisation support had made no difference to their 2007 turnover level

6.4 GVA Impact breakdowns

The GVA impacts were driven by particular types of businesses. These are outlined in Table 6.4 below.

Commercialisation Contributors to Impact **Table 6.4**

Main Contributor to Impact	Contribution to net GVA Impact	Percentage of the Population
Enabling technologies	52%	63%
Businesses trading for over 3 years	89%	64%
Businesses at the growing business stage	76%	34%
Small businesses (10-49 employees)	58%	38%
Companies not accessing university projects	88%	58%
Non spin outs	96%	91%
Companies accessing less than 5 interventions	92%	85%

6.5 Benchmarking GVA

The impacts arising from the commercialisation programme compared favourably to other similar interventions.

The cost benefit ratio (including the ITI impacts) for the commercialisation programme for 2004-2007 amounted to 1: 1.23. Other evaluations using a similar approach[15] (and part of the commercialisation programme) and timeframe have ratios of:

- 1: 0.42 for the Edinburgh Pre Incubation Scheme[16]
- 1: 0.10 for the GTI Business Connection project[17]

In addition, the Department for Business Enterprise and Regulatory Reform (BERR – now UK Department for Business, Innovation and Skills) impact report for the English Regional Development Agencies[18] suggested that science, R&D and innovation infrastructure investment provided the lowest return from the group of business supports highlighting the challenge of generating GVA from very early stage businesses.

Commercialisation interventions take time to generate a return and may provide benefits either just above or below the costs of the support, at least in the short term. The commercialisation programme therefore appeared to be operating within acceptable limits.

[15] In effect Scottish Enterprise standard question set, optimism bias adjustments, failure and acquisition and cost benefit analysis over a 15 year time horizon

[16] Frontline Consultants (2009) *Economic Impact Evaluation of the Edinburgh Pre Incubation Scheme*, Scottish Enterprise

[17] Frontline Consultants (2009) *GTI Business Connections Evaluation*, Scottish Enterprise

[18] PWC (2009) *Impact of RDA Spending – National Report – Volume 1 – Main Report*, Department for Business Enterprise and Regulatory Reform

6.6 Summary

The key messages around the impact to date were that:

- there was a peak of 1,769 jobs created or safeguarded in 2007 as a result of the commercialisation support – as well as clear employment time additionality
- over £115 million of net additional GVA was generated between 2004 and 2007, a cost benefit ratio of 1: 1.23 – with clear GVA time additionality
- this GVA was largely coming from:
    - small businesses
    - enabling technology businesses
    - businesses trading over three years
    - companies at the growing business stage
    - companies accessing projects not delivered/managed by universities
    - non spin out companies
- the programme generated a cost benefit ratio that compared favourably with other similar interventions

7 Impact Assessment – Potential Future Impacts

This section outlines the potential future economic impacts of the commercialisation programme. The section includes the results from the ITI impact assessment.

7.1 Broad approach to the impact assessment

The approach to the future impact assessment followed the same basic principles as the evaluation impact, with future impacts being grossed up to the 1,306 company population. However, in addition to the collection of key impact variables, adjustment for additionality and cost benefit analysis two additional stages were added:

- **adjustment for optimism bias**: all gross projections were adjusted for over optimism based on a performance benchmark with the top UK and EU businesses
- **adjustment for potential acquisition and failure**: all net impact figures were adjusted for potential failure and acquisition, where companies either fail or were bought over by larger companies leaving only a shell company within Scotland

The method and adjustments were outlined in Table 7.1 below for milestone years[19]. Again these are the average values with the actual calculations using company specific data.

Appraisal Period GVA Additionality Adjustments for Milestone Years **Table 7.1**

	2008 (Year 4)	2009 (Year 5)	2011 (Year 7)	2013 (Year 9)	2018 (Year 14)
	Gross value	**Gross value**	**Gross value**	**Gross value**	**Gross value**
Optimism Bias	34%	51%	59%	60%	71%
	Optimism bias adjusted gross impact	**Optimism bias adjusted gross impact**	**Optimism bias adjusted gross impact**	**Optimism bias adjusted gross impact**	**Optimism bias adjusted gross impact**
Deadweight	76%	77%	90%	93%	95%
Displacement	4%	4%	4%	4%	4%
Substitution	0%	0%	0%	0%	0%
Leakage	0%	0%	0%	0%	0%
Multipliers	1.68	1.68	1.68	1.68	1.68
	Net Impact	**Net Impact**	**Net Impact**	**Net Impact**	**Net Impact**
Failures	0%	2%	13%	16%	30%
Acquisitions	0%	4%	26%	32%	61%
	Adjusted net total	**Adjusted net total**	**Adjusted net total**	**Adjusted net total**	**Adjusted net total**
Discount 3.5%	0.8714	0.8420	0.7860	0.7337	0.6178
	Net Impact NPV	**Net Impact NPV**	**Net Impact NPV**	**Net Impact NPV**	**Net Impact NPV**

7.2 Employment impacts

The future employment impact of the commercialisation programme reflects both potential creation and safeguarding of employment over the period 2008-2018.

As the potential jobs covered both created and safeguarded it was not possible to provide a total employment figure across the period, but instead an annual snapshot in each of the key milestone years between 2008 and 2018. In total:

[19] Note impact values were calculated on a company by company basis, the values in the table represent the averages across the 100 companies

- a peak of 3,068 net additional jobs created or safeguarded in 2009 as a result of the commercialisation programme
- a peak of 3,424 net additional jobs created or safeguarded in 2009 as a result of the ITI investment
- a net additional employment level across both programmes of 3,424 jobs in 2009

Employment Impact for Milestone Years **Table 7.2**

	Commercialisation Programme	ITIs	Total
2008	2,702	228	**2,930**
2009	3,068	356	**3,424**
2011	1,325	735	**2,060**
2013	1,491	1,005	**2,496**
2018	962	1,005	**1,967**

Note: employment falls after 2013 as deadweight increases amongst the commercialisation companies

7.3 GVA impacts

An estimate of future impact is the potential future effect of the commercialisation programme and ITI investment on the economy. This was measured as the potential net increase in gross value added (GVA) accruing as a direct result of the Scottish Enterprise investment less optimism bias and potential acquisition and failure.

In total between 2008 and 2018:

- the potential net discounted GVA impact of the commercialisation programme could amount to £145.5 million against a discounted cost of £57.2 million; a cost benefit ratio of 1: 2.54
- the potential net discounted GVA impact of the ITI investment could amount to £273.7 million against a discounted cost of £14.1million; a cost benefit ratio of 1: 19.36
- this could amount to a total net discounted GVA of £419.2 million between 2008 and 2018; a cost benefit ratio of 1: 5.88

Commercialisation Programme GVA Impact 2008-2018 **Table 7.3**

	Commercialisation Programme	ITIs	Total
Costs (NPV)	£57,185,909	£14,136,281	**£71,322,191**
GVA (NPV)	£145,518,192	£273,727,873	**£419,246,065**
Cost Benefit Ratio	1: 2.54	1: 19.36	**1: 5.88**

This means that the commercialisation programme could generate a return on the further investment between 2008 and 2018, while the ITI investment could generate an even more sizeable return. When combined this could amount to a return of £5.88 for every further £1 invested. Again, the costs data only includes direct programmer or project costs, wider staff and overhead costs are excluded from this analysis.

7.4 GVA Impact breakdowns

The same types of companies who contributed to the economic impact to date were likely to drive future impact as well. These are included in Table 7.4 below.

Potential Contribution to Impact **Table 7.4**

Main Contributor to Impact	Contribution to Impact	Percentage of the Population
Enabling technologies	66%	63%
Businesses trading for over 3 years	69%	64%
Businesses at the growing business stage	42%	34%
Small businesses (10-49 employees)	64%	38%
Companies not accessing university projects	68%	58%
Non spin outs	89%	91%
Companies accessing 3 interventions	40%	28%

7.5 Summary

The key messages around the potential future impacts were that:

- there could be a peak of 3,424 jobs in 2009 as a result of the commercialisation support
- GVA to the value of £419 million could be generated between 2008 and 2018; a cost benefit ratio of 1: 5.88
- this GVA could potentially come from small enabling technology businesses over three years old (and at the growing business stage) and accessing projects not delivered/managed by (or spun out from) universities

8 Conclusions

The Scottish Enterprise Commercialisation Programme provides a wide range of support mechanisms to technology based companies and pre-incorporated entities. The commercialisation programme was clearly well regarded by businesses and has achieved a positive impact on the Scottish economy.

By building on the learning from this review, it should be possible for Scottish Enterprise to continually drive up standards and therefore outcomes arising from commercialisation. This section provides an overview of the conclusions and recommendations of the review.

8.1 Scope for further and more co-ordinated support

Despite a small proportion of companies having multiple interventions – up to 7 in some cases – there were few signs of linkages or patterns of flow across the approach, suggesting that it is really a series of projects. With a more co-ordinated approach there could be scope to grow companies and deliver a programme of support in which the sum could be greater than its parts.

The majority of companies only accessed one intervention. While these companies realised good returns, they continued to cite barriers to development. These companies, therefore, presented an opportunity for further intervention which could have increased their potential.

8.2 Fit with the priority sectors

Where companies accessed multiple interventions, there was good alignment with the priority sectors based on SIC classification. This was less clear with single intervention companies, where a high proportion did not fit well. Given the importance of the priority sectors to the Scottish economy, it will be important to ensure appropriate targeting to maximise benefits. This would also help in co-ordination of support since a high proportion of projects in the commercialisation programme are already tailored to suit the needs of the priority sectors.

8.3 A need to broaden the scope of the programme

The projects that make up the commercialisation programme are largely focused on technology development, despite businesses shifting their focus to marketing and sales over the course of their development. This suggests that, as it currently stands, the programme could (and did) only help companies to a point. As companies move towards the market, there is scope to broaden the programme to include more support for marketing, sales and wider business improvement.

8.4 Sector differences

There are clear sectoral differences at different stages in the company journey. Enabling technology companies had an earlier focus on the market and routes to market, while life sciences companies were more focused on research findings and accessing equity investments. Life sciences companies worked more with universities than enabling technology businesses. Finance was a particular barrier for enabling technology companies at the product development stage, while life sciences firms had more difficulties selling there products or services.

8.5 Commercialisation programme interventions have the potential to speed up and reduce the cost of company development

The process of company development appears, on average, to be faster than would have been expected for technology based businesses, ie 5 years compared to 7 years in the wider SE research.

In addition, average cost was lower at £1.6 million, compared to wider research that suggests costs between £4-5 million.

Although these are average times and costs, with companies citing varying responses, they provide evidence to suggest that the programme interventions are making a difference and, if this continues over time, could have a significant impact on the performance of Scottish based technology businesses.

8.6 Finance – a barrier not a brake

Finance was cited as a barrier across all stages, but it was not a brake to development, with companies finding a variety of solutions to minimise the impact. Crucially, the right money at the right time was perceived to be more important than simply more money. This is important given tightening of budgets, but again highlights the benefits that could be realised from a more co-ordinated approach.

8.7 Companies are ambitious but the challenge is great

Companies have ambitious future growth projections. At present 16 companies have turnover above £1 million and 74 have the ambition to achieve this by 2013. In addition, just one company had turnover above £20 million in 2007 though this is projected to rise to 11 companies by 2013. This highlights significant ambition in the companies, but also the shift and scale of challenge to meet these projections.

8.8 Impacts compare favourably with other SE interventions

The impact of the programme to date was positive, amounting to a peak of 1,179 jobs in 2007 and GVA impacts of £115 million between 2004 and 2007. This gave a cost benefit ratio that compared favourably with other similar interventions, especially at a time in the company development process that traditionally delivers limited economic returns.

If future impacts are achieved the impacts could rise to a peak of 3,424 jobs in 2009 and GVA of £419 million between 2008 and 2018. Again, this gave a cost benefit ratio that compared positively with other similar interventions. The programme has had, and could continue to have, a substantial impact on the Scottish economy.

While these impacts are relatively positive, both to date and projected, much of the impact is likely to be driven by a small number of particularly high growth companies.

8.9 Net Impacts are driven by particular companies and the support they access

The net impacts (both realised to date and projected) largely come from:

- small (between 10 and 49 staff) business
- those with an enabling technology focus
- businesses trading for over three years
- those in the market

In addition, spin out and university projects appear to deliver lower net additional benefits, while licenses to existing companies deliver quicker and bigger impacts.

8.10 Benefits are wider than GVA

While the GVA figure was positive, and a measure of success for SE, it should not be the only measure of success when engaging with early stage companies. Indicators such as investment raised, R&D spend, intellectual property generated, innovations produced at the value of employment, would go a long way to providing a more rounded picture of progress.

8.11 High levels of satisfaction

Satisfaction was very high across the range of commercialisation programme interventions with good practice emerging at all levels. Overall satisfaction compared favourably with the more intensive DRM support. This good practice should be drawn out and used to continually improve the offering, ensuring that high levels of satisfaction are maintained.

8.12 Company data needs improving

The data held on companies by Scottish Enterprise was poor and incomplete. These are companies that have often been provided with significant SE resources and have no doubt supplied extensive background information during that time. Better use of systems in place to track and monitor companies would help clarify the extent of the intervention and enable improved targeting and planning of future support.

Frontline Consultants

October 2009

Appendix 1

Companies Surveyed

Companies Surveyed	
3D Visual Simulations Ltd	Futuretec
3MRT	Gas Sensing Solutions
Accura Healthcare	Intellevation
Affective Media	Intrallect
Alan Proctor	Inxstor
Albagaia	Kelvin Connect
Altia Solutions	Lab 901
Amphotonix	Lazy day Foods
Aptuit	Lutess Ltd
Arrayjet	Lux Innovate Ltd
Artilium	M Squared Technology
Avanticell	Mobiqa
Avotec	Nessco
Big DNA	Novabiotics
Biopta	NXVision Ltd
BiP Solution	Ocutec
Boreas	Ovisor Technologies
Brainwave	Photosynergy
C2 Software	Plurion
Calnex	Point 35 Microstructures
Calton Hill	PWB Healthcare Ltd
Calvatec	Quantum Filament Technologies
Ceannard Limited	Rapid Mobile Media Ltd
Cellucomp	Reactec
Centeo Biosciences	ReallInnovations
Cheetah Advanced Technology	Red Spider Technology
Ciqual	Scalar Technologies
Cohort Studios	SFX Technologies
Conjunct	SMAR- AZURE
CXR Bioscience	Spinsight
Cytosystems Ltd	Spiral Gateway
DEM Solutions	SST Sensing Ltd
Denfotex	St Andrews Fuel Cells Limited
Design LED	Stevenson Reeves Ltd
Dharmacom	Strathkelvin Instruments
Dimensional Imaging	Sutherlands Edinburgh Ltd
Dundee Cell Products Ltd	The Medical Phone Company
Dynamic Innovations	Think Tank Maths Ltd
E-Com	Veracity Ltd UK
Ectopharma	Waracle
Emblation Medical	Wide Blue
Environmental Building partnership ltd	Xanic
Eologic	Xeroshield Ltd
Factonomy Ltd	XIPower
Fios Genomics	Xircon Ltd
Flexpansion	York EMC
Formedix	Zero-ed In Ltd

Appendix 2

List of Working Papers

Working papers	
Working paper 1	Company engagement with the programme
Working paper 2	Evaluation of process
Working paper 3	Economic impact to date
Working paper 4	Economic appraisal
Working paper 5	Economic impact analysis
Working paper 6	Economic Impact to date (grossed)
Working paper 7	Economic appraisal (grossed)
Working Paper 8	Intellectual property
Working paper 9	Company journey

Appendix 3

Sample GVA Additionality Sheet

Evaluation Additionality Calculator GVA Year 3 (2007): Frontline Version

	Enter Project Name	Commercialisation Programme																		
Additionality Calculation																				
Intervention Option	Gross Impact	Optimism Bias Adj	Leakage	Displacement	Substitution	Multiplier	Reference Case	Deadweight		Leakage	Displacement	Substitution	Multiplier	**Additionality**	(Grand Total at end →)	Grossing Factor	1) NET GVA Impact	Discount @ 3.5%		NPB
	GI	0%	L	Dp	S	M				L*	Dp*	S*	M*	AI		1				
Label	*Enter gross impacts e.g. 25 (jobs); £1m (turnover)*		*Enter levels of leakage e.g. 25%*	*Enter levels of displacement e.g. 10%*	*Enter levels of substitution e.g. 15%*	*Enter multipliers e.g 1.32, 1.64*		*Enter level of deadweight e.g. 35%*		*Enter Different Reference Case Values if Required*				(jobs)						
Company 1	£220,000	220,000	0%	60%	0%	1.80		90%	198,000	0%	60%	0%	1.8	15,840	15840		£15,840	0.901942706		£14,287
Company 2	£225,400	225,400	0%	0%	0%	1.80		80%	180,320	0%	0%	0%	1.8	81,144	81144		£81,144	0.901942706		£73,187
Company 3	£164,800	164,800	0%	30%	0%	1.40		90%	148,320	0%	30%	0%	1.4	16,150	16150		£16,150	0.901942706		£14,566
Company 4	£960,000	960,000	0%	5%	0%	1.70		90%	864,000	0%	5%	0%	1.7	155,040	155040		£155,040	0.901942706		£139,837
Company 5	£178,200	178,200	0%	0%	0%	1.60		40%	71,280	0%	0%	0%	1.6	171,072	171072		£171,072	0.901942706		£154,297
Company 6	£480,000	480,000	0%	15%	0%	3.10		75%	360,000	0%	15%	0%	3.1	316,200	316200		£316,200	0.901942706		£285,194
Company 7	£22,000	22,000	0%	0%	0%	1.40		70%	15,400	0%	0%	0%	1.4	9,240	9240		£9,240	0.901942706		£8,334
Company 8	£102,000	102,000	0%	65%	0%	3.10		90%	91,800	0%	65%	0%	3.1	11,067	11067		£11,067	0.901942706		£9,982
Company 9	£4,000	4,000	0%	0%	0%	1.40		50%	2,000	0%	0%	0%	1.4	2,800	2800		£2,800	0.901942706		£2,525
Company 10	£6,800	6,800	0%	5%	0%	1.70		90%	6,120	0%	5%	0%	1.7	1,098	1098		£1,098	0.901942706		£990
Company 11	£0	0	0%	0%	0%	1.60		100%	0	0%	0%	0%	1.6	0	0		£0	0.901942706		£0
Company 12	£0	0	0%	0%	0%	1.68		100%	0	0%	0%	0%	1.7	0	0		£0	0.901942706		£0
Company 13	£0	0	0%	0%	0%	1.70		100%	0	0%	0%	0%	1.7	0	0		£0	0.901942706		£0
Company 14	£17,095	17,095	0%	0%	0%	1.40		100%	17,095	0%	0%	0%	1.4	0	0		£0	0.901942706		£0
Company 15	£0	0	0%	0%	0%	1.68		100%	0	0%	0%	0%	1.7	0	0		£0	0.901942706		£0
Company 16	£4,000,000	4,000,000	0%	10%	0%	1.40		95%	3,800,000	0%	10%	0%	1.4	252,000	252000		£252,000	0.901942706		£227,290
Company 17	£0	0	0%	0%	0%	1.70		100%	0	0%	0%	0%	1.7	0	0		£0	0.901942706		£0
Company 18	£47,250	47,250	0%	1%	0%	1.40		100%	47,250	0%	1%	0%	1.4	0	0		£0	0.901942706		£0
Company 19	£30,030	30,030	0%	0%	0%	1.50		90%	27,027	0%	0%	0%	1.5	4,504	4504		£4,504	0.901942706		£4,062
Company 20	£50,000	50,000	0%	0%	0%	1.80		0%	0	0%	0%	0%	1.8	90,000	90000		£90,000	0.901942706		£81,175
Company 21	£0	0	0%	0%	0%	1.90		100%	0	0%	0%	0%	1.9	0	0		£0	0.901942706		£0
Company 22	£120,000	120,000	0%	0%	0%	1.68		0%	0	0%	0%	0%	1.7	201,600	201600		£201,600	0.901942706		£181,832
Company 23	£213,684	213,684	0%	0%	0%	1.40		100%	213,684	0%	0%	0%	1.4	0	0		£0	0.901942706		£0
Company 24	£0	0	0%	0%	0%	1.70		100%	0	0%	0%	0%	1.7	0	0		£0	0.901942706		£0
Company 25	£4,274	4,274	0%	0%	0%	1.40		95%	4,060	0%	0%	0%	1.4	299	299		£299	0.901942706		£270
Company 26	£105,000	105,000	0%	0%	0%	1.70		50%	52,500	0%	0%	0%	1.7	89,250	89250		£89,250	0.901942706		£80,498
Company 27	£0	0	0%	0%	0%	1.50		75%	0	0%	0%	0%	1.5	0	0		£0	0.901942706		£0
Company 28	£0	0	0%	0%	0%	1.40		100%	0	0%	0%	0%	1.4	0	0		£0	0.901942706		£0
Company 29	£150,000	150,000	0%	0%	0%	1.40		100%	150,000	0%	0%	0%	1.4	0	0		£0	0.901942706		£0
Company 30	£89,462	89,462	0%	0%	0%	1.50		0%	0	0%	0%	0%	1.5	134,194	134194		£134,194	0.901942706		£121,035