Commercialisation programme longitudinal review: final report

for

Scottish Enterprise



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Executive Summary

Policy makers have long recognised the important contribution of commercialisation¹ to improving innovation, productivity and GDP growth and it has been to the fore of economic development thought and policy in Scotland since the Royal Society of Edinburgh Commercialisation Enquiry in 1996.

Scottish Enterprise (SE) has long had a clear strategic commitment to commercialisation, developing and investing in a number of initiatives and programmes to support 'IP to IPO'. However, despite significant potential in the science and company base and considerable investment in support to commercialise, this had translated into a very small number of high growth, large scale companies.

In an attempt to improve Scotland's performance, SE undertook a strategic review of its commercialisation activity in 2008 and, as a result, introduced a radical re-shape of its commercialisation support. The approach is now focused on a fewer number of companies with the ambition to achieve significant scale and directs SE support towards:

- building strong business management teams from the outset;
- understanding line-of-sight to market entry from the outset;
- taking a single coordinated approach to advisory and funding support;
- de-selecting underachieving projects, where appropriate, and focusing resources onto the strongest propositions;
- where possible, seeking to ensure new businesses are anchored in Scotland.

Commercialisation Review 2011

As a follow up to the initial commercialisation review in 2008, a follow-up review was undertaken in 2011 with the aims to:

- examine the progress made by companies since they were first interviewed in 2008;
- interview a new set of companies many of which have benefitted from up to 2 years of the re-focused commercialisation support;
- compare the findings between the 2008 and 2011 cohort of companies;
- quantify the current and projected impacts from our investment in commercialisation; and
- better understand the development needs for companies and to consider their implications for current policy and support.

The 2011 Review surveyed 82 companies: 52 from the original 100 interviewed in 2008 and 32 new companies supported since 2008.

Key Messages

Despite challenging trading conditions during the period 2008-2011, the majority of companies surveyed have increased their turnover and employment and raised additional finance. However, the recession has slowed company growth and all companies are behind projected turnover levels.

The impact from SE's support on company performance has significantly increased since the initial Review in 2008. The 'return on investment' to the public sector purse between 2004 and 2011 has increased from £1.2 to £3.2 for every £1 spent. Future impacts, for the full period to 2004-13,

¹ Commercialisation is defined as assisting researchers, entrepreneurs and innovative companies to convert ideas into successful commercial ventures.

forecast a return of £6.1 for every £1 spent and £509.9 million of net additional GVA to the Scottish economy.

The majority of impacts are driven by a small number of start-up companies in the Enabling Technologies sector. However there is a gradual increase in the contribution from spinout companies and Life Science businesses from 2016 onwards.

How have companies performed between 2008 and 2011?

Of the 52 companies interviewed in 2008 and 2011:

- Fewer companies than expected had stopped trading: 25% companies have failed and 4 have been acquired against expected company failure rate of 30%;
- More companies are in the market with a product and have grown both turnover and employment (62% compared to 42% in 2008);
- 81% of companies are exporting or trading internationally through Joint Ventures or distribution arrangements, and 62% of those communicated higher proportions of export sales in 2010/11;
- Company growth is episodic and growth spurts are triggered by significant change e.g. move into a new markets or a change in company leadership;
- More companies recognise the importance of a commercially-focused management team to future growth and their ability to raise finance;
- Companies are finding it harder and more time consuming to raise investment. However, while bank loan finance has almost disappeared, angel and VC finance have held up better;
- More companies are funding future plans from their own cash at the early stages and profits at the latter stages.

What's different about the new companies?

New businesses in the survey are:

- Taking slightly longer to get to market, and, as a result, it is costing more;
- More outward looking, building stronger competitive positions with competitors and customers and attracting new sources of finance and support from outside of Scotland;
- Focusing on the market and routes to market earlier;
- Showing a significant increase in the use of Scottish Development International (SDI) support with 80% of companies are looking to export and set up overseas.

Lessons for policy and support

There are clear signs that the re-focusing of SE's commercialisation approach is demonstrating early signs of greater impact.

Evidence is also coming through that the single coordinated approach to advisory and funding support is appreciated by companies and is contributing to their future success and forecasted impacts.

Almost all companies cite benefits arising directly from the wider support they have accessed from SE. As direct benefits from SE support companies have attributed:

- Increased company value;
- Increased sales;
- Improved skills; and
- A more robust product portfolio.

However, two significant barriers to growth are emerging that require further investigation to assess how they need to be addressed, namely:

- Increased difficulty in securing external investment, especially at the later stages of getting products ready for the market;
- New forms of support suggested helping to improve marketing capability, to better understand their customers and to de-risk the test and demonstration of products.

1 Introduction

Frontline was commissioned by Scottish Enterprise (SE) to conduct the 2011 Commercialisation Review, a longitudinal study aimed at understanding the development cycle of technology based businesses within the commercialisation arena. The work was designed to build on the 2008 Review.

Since the 2008 Review, SE has introduced a new commercialisation approach that has re-focused SE's support towards:

- building strong business management teams from the outset
- understanding line of sight to market entry from the outset
- taking a single coordinated approach to advisory and funding support
- selecting fewer projects in and providing greater acceleration of strongest propositions
- de-selecting underachieving projects, where appropriate, and focusing resources onto the strongest propositions
- where possible, seeking to ensure new businesses are anchored in Scotland.

A number of activities have been fundamentally reshaped in response to the 2008 Review, raising the level of ambition for the outcomes from SE investment including most significantly ITI integration. The support has also been restructured into a new team approach.

Commercialisation support is now defined by the following structure:



Businesses may also have been supported through other projects which have since stopped (and in many cases by SE's more mainstream product portfolio through Account Management support). During the period of the 2008 Review (2004-2008) SE's commercialisation approach was integrated with innovation, hence that review included a wider range of SE supports.

1.1 Approach and the Branscomb Model

The Branscomb Model was adopted during the 2008 Review as the framework for mapping company development from basic research to a growing business in four stages² as outlined below. While it was understood that the company journey was not linear or easily phased, this approach was used to provide consistency of assessment across companies. For consistency this model was used in the 2011 Review.



1.2 Approach

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

The aims of the work were to:

- determine the development needs, in terms of technology, market, management and investment for companies at each stage
- examine how businesses progress from one stage to the next and what are the routes to business growth
- assess what are the drivers, enablers and constraints to making progress across Branscomb stages
- determine how preferred routes to commercialisation vary between sectors and business origin
- determine whether or not success and failure profiles can be defined with precision
- investigate correlations between potential inputs and outputs, and assess whether successful outcomes are scalable
- compare outputs, outcomes and impacts across the two periods of the study.

The work included:

- review of the original questionnaire, focussing on additional areas for exploration due to the changing SE model of support for technology companies, while still allowing for direct longitudinal comparison
- longitudinal surveying of the original 100 companies
- pre-population of longitudinal company data prior to interview
- survey sampling of new companies who had accessed the commercialisation programme since 2008
- analysis of findings across the longitudinal (2008 and 2011) sample and new companies – investigating differences as companies move along their journeys towards growing businesses
- economic impact assessment across the longitudinal and new samples.

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

The analysis focuses on two sample groups:

- longitudinal companies³ those companies that were re-interviewed during 2011 to compare their journeys from 2008 to 2011 52 interviews from the original 100 companies were realised. These are referred to as 'Wave 2 Longitudinal' or 'longitudinal sample' through that report
- new companies the 32 interviewed for the first time in 2011, representing businesses supported since 2008 under the revised SE approach to commercialisation. These are referred to as 'Wave 2 – New' or 'new sample' throughout this report.

Further, the samples were segmented by sector (namely Life Licences and Enabling Technologies⁴) and origin (university spin out or start-up⁵) to determine whether differences could be attributed.

1.3 **Population overview**

In Wave 1, 100 companies were interviewed at various stages of company development. In addition, eight Intermediate Technology Institute (ITI) companies were interviewed to capture impact only.

At Wave 2, 84 companies were interviewed:

- 52 companies from Wave 1 now the Wave 2 Longitudinal sample; and
- 32 companies that had been supported since 2008 Wave 2 New sample

Characteristic	Wave 1 – 2008	Wave 2 – Longitudinal	Wave 2 – New	
Sample size	100	52	32	
Origin	33% spin outs	33% spin outs	44% spin outs	
Company status	95% limited company	96% limited	91% limited	
Company status	75% Infined company	company	company	
	63% enabling	63% enabling	44% enabling	
Sector split	technologies	technologies	technologies	
	29% life sciences	31% life sciences	41% life sciences	
Trading status	29% pre revenue	12% pre revenue	34% pre revenue	
Support Status	85% Account	94% Account	78% Account	
300001 310103	Managed	Managed	Managed	

The table below summarises the characteristics of each sample⁶.

Tables showing Wave 1 – 2008, Wave 2 – longitudinal, new for 2011 and the original 2008 split across Branscomb stage, industry sector and sub sector, origin and SE Account Management status are in set out in Appendix 1. The original Wave 1 2008 sample data also describes which companies are now insolvent.

³ Wave 1 is defined as 2004-2007 (implemented in 2008) and Wave 2 as 2008-2010 (implemented in 2011)

⁴ Enabling Technologies include companies with capabilities in electronics, photonics, electrical systems, ICT, biosciences, advanced materials and advanced engineering

⁵ Start-up include traditional industry/individual based start-ups and those started through an ITI license as the sample of ITI was too small to conduct any separate analysis

⁶ For Wave 1 – 2008, the table excludes the ITI companies as we only had impact data, and therefore presents the findings for 100 companies.

2 Economic Impact

This section presents the main economic impact findings. A summary impact report is included as Appendix 2 and a full set of impact tables is attached in Appendix 5.

2.1 Net GVA impact and impact: cost ratios

2.1.1 Net GVA Impact to date (2010)

SE supported 1,306 'Wave 1' companies to commercialise in 2004 - 2008. Estimated (grossed up) impact from 'Wave 2 Longitudinal' interviews yields attributable net GVA impact of **£429.6m (PV**⁷)⁸ from SE support to the Scottish economy by 2010 (year 7).

In 2008/9 SE evolved its commercialisation support, becoming more selective about the companies it supported and offering more intensive support where appropriate. By 2010 SE worked with 323 'Wave 2 New' supported technology businesses. Estimated (grossed up) impact from interviews with these companies, yields a net GVA impact attributable to SE support (to the Scottish economy) of **£9.3m (PV)**⁹ by 2010 (year 3).

Net GVA impact on the Scottish economy attributable to SE support across 2004/5-10/11 (inclusive), is estimated at **£438.8m (PV)**.

2.1.2 Projected 10 year net GVA impact

For Wave 1, the attributable net GVA impact on the Scottish economy over ten years (i.e. by 2013, year 10) from SE support is estimated at **£630.7m (PV)**.

For Wave 2, the attributable net GVA impact on the Scottish economy over ten years (i.e. by 2017, year 10) from SE support is estimated at **£303.9m (PV).**¹⁰

Net GVA impact on the Scottish economy attributable to SE support across both cohorts over a ten year period is estimated at **£934.6m (PV)**.

2.1.3 Impact: cost ratios

The cost of SE support to the Wave 1 companies supported from 2004 to date (inclusive of appropriate ITI costs) is estimated at ± 103.0 m (PV). The cost of SE support to the Wave 2 New companies to date (again inclusive of appropriate ITI costs) from 2008 is estimated at ± 36.9 m (PV).

The (mid-point estimate) impact: cost ratios of SE support over 10 years are estimated to be:

- Wave 1 companies £6.1 net GVA impact in the Scottish economy by 2013 for every £1 of SE spend¹¹
- Wave 2 New companies £8.2 net GVA impact in the Scottish economy by 2017 for every £1 of SE spend

⁷ impacts and costs have been discounted back to 2004 prices

⁸ this value is the mid-point estimate of the range of impact; the margin or error being estimated at c+/-17% in year 1

⁹ this value is the mid-point estimate of the range of impact; the margin or error being estimated at c+/-14% in year 1

¹⁰ Note: the 10 year timeframe for each wave does not necessarily represent time from first instance of SE support

¹¹ Note: this value is higher than that reported in 2008, mainly on account of a strong achieved performance since the previous exercise. Figure A2.1 (Appendix 2) sets out the annual cost-impact ratios for each Wave

Considering margins of error for the samples, and corresponding confidence intervals, the level of performance estimated for Wave 2 New companies represents a statistically *significant* improvement on that quoted for the original 2008 exercise (over a 10 year timeframe) and compares favourably with the return on investment expected from SE's interventions, as set out in the 'Scottish Enterprise Business Plan 2011/14'.

In comparing the (predicted) performance of the two cohorts, a key factor is the speed to which the new cohort consolidates impact, as evidenced by the gradient of the lines in Figure 2.1. From the company interviews, see Chapter 3, one hypothesis to explain the differences would be the improved holistic end-market focus from the outset of the commercial venture which defines the new approach to commercialisation.

Note: these estimates are at a single point in time and do not assume any further costs (to SE) being realised. Additional costs incurred will reduce the impact ratios quoted. The robustness of these estimates are tested by application to a number of scenarios as set out in Appendix 2.

As Figure 2.1 shows, the impact: cost ratios are estimated to continue to improve, reaching £13.6 to £1 for the Wave 2 New supported companies by 2021, £11.1 to £1 for the Wave 1 companies, and £11.3 for both cohorts combined.



2.2 Net employment impact

For Wave 1 businesses, by 2013 (year 10) net employment impact (in job years) to the Scottish economy attributable to SE support is estimated to reach 1,334 net jobs. This is equivalent to a cost per net job of **£77.2k** (PV) over the ten year period.

For Wave 2 businesses, by 2017 (year 10) net employment impact (in job years) to the Scottish economy attributable to SE support is estimated to reach 722 jobs. This is equivalent to a cost per net job of **£51.2k** (PV) over the ten year period. This suggests that SE's new approach to supporting technology companies may be creating proportionately more net jobs in the Scottish economy from the amount invested.

2.3 Drivers of impact

The evidence suggests that greater net GVA impact and return on investment per company will ultimately be achieved from the Wave 2 New companies – those supported since 2008 under a more selective and intensive commercialisation support programme. Notwithstanding consideration of margins of error, Wave 2 businesses are projected to deliver proportionally higher impact than Wave 1 businesses, accounting for over 40% of total GVA impact from 2016 onwards from 37% of total companies supported.

These higher projected impacts could be influenced by changes in behaviour in the Wave 2 New companies compared to the Wave 1 ones, such as earlier market focus and commercial management, which are reported in the next section.

These companies exhibit:

- deadweight levels which are slightly higher than across Wave 1 companies, suggesting that more resilient companies, less dependent on state subsidy, may be being supported under the New programme
- displacement levels which are slightly lower than across Wave 1, suggesting that more knowledge intensive, export oriented businesses may be focused upon under the New programme

A **small number of top performing companies drive aggregate impact** projections – the five largest net GVA contributing companies projected for the year 2021 account for 46% of total impact, while the top 20% will account for 80% of total impact. Naturally, where impact is driven by a small number of businesses this introduces risk to overall programme performance.

Spin out companies are projected to deliver a bigger proportionate share of net GVA impact than non-spin outs – over 40% of impact after 2016 from 37% of companies.

Life science companies are also projected to deliver a bigger proportionate share of net GVA impact than enabling technology ones – 45% of impact after 2016 come from 34% of companies (note: numbers are skewed by the two highest impact businesses in the sample).

2.4 Wider impacts

In consideration of wider benefits to the economy, it is recognised that the outcomes from the programme contribute towards the Scottish Government's performance targets.

SE support is delivering **productivity** impact, thereby contributing to the Purpose Target of ranking Scotland in the top quartile against key trading partners. At £92k and £90k average GVA per worker in the Wave 2 New and Wave 2 Longitudinal samples respectively, productivity is much higher than in the average Scottish firm (c£50k per employee)¹².

Programme outcomes also contribute to the following National Indicators:

 narrowing the gap in research and development spending – the nature of business activity will contribute significantly to levels of Business Expenditure in Research & Development, BERD (although it is not possible to determine actual expenditure figures)

¹² Note: the questionnaire did ask for full and part time work patterns but did not apportion calculations on this basis. Resulting productivity impacts are therefore likely to be higher than those quoted

grow exports at a faster rate than GDP - SE support is helping companies to access new export markets (35%) and to improve export sales (25%). Going forward, all companies are projecting significant increases in the proportion of their sales derived from exports – from 21% to 60%, 2010-16, across the Wave 2 New companies and from 42% to 70% across the Wave 2 Longitudinal companies. Net additional impact from exports is estimated to grow from £59m net additional GVA in 2010/11 (across both cohorts) to £288.3m per annum by 2017/18.

With regards to *timing additionality* (i.e. the extent to which the intervention(s) had the effect of bringing forward activity earlier than would otherwise have been the case), SE support is helping companies to generate sales (55% of all companies) and to create employment of staff (52% of companies) **sooner** than they otherwise would have. Tables 2.14 and 2.15 detail the extent of 'timing additionality' by business cohort.

Considering the guarantee of competitive advantage gained through intellectual property protection SE support has helped companies to **protect their IP** – 63% of Wave 2 New and 80% of Wave 2 Longitudinal companies.

Considering wider spillover benefits, despite experiencing skills barriers throughout the development journey (see Section 3.11), companies are experiencing improvements in skills within their businesses (Section 3.13).

3 Commercialisation Journey

Then key findings from this chapter are:

- Companies have shown growth in employment, turnover and investment despite difficult trading conditions
- More companies are exporting, with export revenues expected to reach over 80% of turnover by 2016
- New companies are taking longer to get to market that in 2008 and as a result it is costing more
- More companies are focused on routes to market earlier, particularly in the new sample cohort
- More companies are building the commercial focus of their management team through recruitment of both executive and non-executive directors
- Companies are more outward looking, building connections with more business, customers and universities
- Companies are needing more money to get to the market and the time to product launch is becoming more critical
- As bank finance becomes more difficult to access companies have become more innovative in sourcing investment, with more companies funding future plans from cash flow and profits
- Lack of finance, skills gaps and technical and market challenges remain key issues
- Public sector support remains crucial and has expanded beyond both SE and Scotland
- Wide ranging benefits are cited resulting from SE support, including increased company value and increased sales

3.1 Introduction

This section discusses the company journey across the Branscomb stages. It compares the Wave 2 – Longitudinal companies, the Wave 2 – New and the original Wave 1 sample as appropriate. The Branscomb model is presented below.



3.2 The company journey

The table below summarises how things have changed since Wave 1. The detailed findings that demonstrate this change are presented throughout this section.

What's happened to companies 2008 – 2011:	How are the 2011 companies different:			
 More companies are trading and have grown both in turnover and employment More companies are exporting Average exports across the sample are increasing and projected to reach over 80% of turnover by 2016 More companies are realising the importance of having the right, commercially-focused management team Growth is linked to moving into new markets – predominately exports – and having the right staff skills Companies are finding it harder and more time consuming to raise investment Bank loan finance has almost disappeared, while angel and VC finance have held up better More companies are funding future plans from their own money at the early stages and profits/cash flow at the latter stages Companies in the product launch/growing business stage are funding more of this from company profits with less reliance on SE 	 Company mix is more evenly distributed by sector and origin Companies are taking longer to get to market and as a result it is costing more Companies are more outward looking, building a stronger competitive position and attracting new sources of finance Companies are building stronger management and leadership teams Companies are focusing on market and routes to market earlier Barriers to growth are still finance, skills and technical and market uncertainty – SE is helping them overcome or minimise these Then role of SDI has shown significant increase as companies look to export and establish overseas offices and supply chains 			

3.3 Companies are progressing to product launch – the Branscomb growing business stage

Companies are moving along the Branscomb stages, such that almost two thirds (62%) of businesses in the Wave 2 Longitudinal sample had reached the market with a product (as defined by Branscomb growing business stage), compared to 42% in the Wave 1 sample.

In consideration of time elapsed the Wave 2 New sample has more companies (31%) in the production/marketing stage than the longitudinal sample, while less had reached the growing business stage (22%). This suggests that the longitudinal sample in 2008 had more companies at the product launch stage and was therefore more mature than the Wave 2 New sample.

Stage split by sample					Table	3.1
		Wave 2 - Lo	- Wave 2 - New			
Branscomb Stage	2008				2011	
	Absolute	%	Absolute	%	Absolute	%
Proving the Concept	4	8%	1	2%	1	3%
Early Stage Technology Development	5	10%	3	6%	7	22%
Product Development	10	19%	7	13%	7	22%
Production/Marketing	11	21%	9	17%	10	31%
Growing Business	22	42%	32	62%	7	22%
Total	52	100%	52	100%	32	100%

In the Wave 2 Longitudinal sample:

- 28 (54%) companies stayed at the **same stage** of these 20 were already in the Branscomb growing business stage and had launched products. Of those eight companies who had remained at the same stage (excluding those having already reached growth business):
 - three businesses in production/marketing all cited issues around sales and marketing skills gaps as a key reason for not moving forward as quickly as intended
 - three cited problems with the technology and the need to do further testing & product development to meet market need
 - two businesses had just commenced a stage during the Wave 1 exercise and were hopeful of moving on to the next stage soon
- 22 (42%) companies moved forward, of these, six moved by two or three stages
- only two companies had moved backwards one company changed its business model, shifting from Life Sciences to the Oil and Gas sectors

There was no significant difference across sector and origin.

3.4 Earlier focus on understanding routes to market

There is evidence that more companies are focusing on understanding routes to market earlier in their journey:

- proving the concept phase 52% of Wave 2 New companies were investigating routes to market at this stage compared to 38% of Wave 1
- early stage technology development 59% of Wave2 New companies were investigating routes to market compared to 46% of Wave 1

This indicates that SE's new approach to commercialisation may be influencing change towards a market focus at an earlier stage in the company development. It helps explain why some Wave 2 New companies highlight sales and marketing skills gaps in these phases, while no Wave 2 Longitudinal companies did so.

Putting an increased, earlier focus on routes to market was frequently reported as something companies would do differently if they could revisit these development stages.

3.5 Increased focus on exports

Companies are putting more focus on exporting. During the growing business phase more of Wave 2 New companies (100%) and Wave 2 Longitudinal companies (81%) reported export sales as an objective compared to 59% in Wave 1¹³.

The average proportion (by turnover) of export sales was 65% for the longitudinal sample in 2010; this was projected to increase to an average of 84% by 2016. The new sample has a slightly lower average export level (61.7%) in 2010, increasing to 82.2% by 2016; therefore the gap had narrowed slightly. This, coupled with a shift towards a greater and earlier focus on exports, suggests commercialisation support will contribute to the GES target of growing exports faster that the average rate of GDP.

The support role of SDI is increasingly cited. In the growing business phase 41% of the longitudinal sample was using this support, compared to 0% in Wave 1. In the new sample, a higher proportion of companies cited SDI from an early stage. This

¹³ Note these figures relate to those companies that are in the growing business phase only i.e. Wave 1 22 companies, Wave 2 Longitudinal 32 companies, Wave 2 New 7 companies.

aligns with the earlier market focus, and in particular export market development, where companies were using SDI for trade missions, exploring the market and helping develop future distribution channels.

3.6 Increased commercial focus of the management team

Management team experience is recognised as a key variable in commercialisation success. In general, the **commercial experience** of the management team in the longitudinal sample has increased, with new team members bringing in additional experience, while existing members have received training and support to improve their skills.

Almost one third (31%) of the longitudinal sample (as recorded in the 2011 exercise) sought support to **build their management team**. This was through the addition of new skills sets and experiences, particularly in sales and finance. In the new sample this increased to 40%. Changes in the management team included new CEOs and directors to new team members and adding investment experienced non execs to the board with previous commercial experience. Key to all these appointments is the need for companies to build a stronger competitive position by getting to market earlier marketing, improving business development and sales, and raising investment.

A slight increase in management team experience of those who had previously started a business (from 75% to 79%) and those who had previously managed a business (from 71% to 75%) was cited.

Management training also shows a slight increase in the Wave 2 Longitudinal sample, with 83% of companies reporting that their management teams had received some training to improve commercial skills (up from 76% in Wave 1).

Spin out¹⁴ companies were more likely to undertake management training (94%) compared to start ups (77%). A higher proportion of spin outs also sought support to build their management team (41% compared to 26%). This greater need for management training and support in spin outs aligns with the perception that in these types of companies the majority of senior management teams are coming from a non-commercial background. The high level of uptake is evidence that spin-out companies are understanding this need and are acting to create a sustainable business.

With regards to the sectoral dimension, in the Longitudinal sample there appears a similarity of performance across the sectors. In the Wave 2 New sample, however, a higher proportion of **life sciences** companies sought support to build their management team (50%) compared to **enabling technologies** companies (31%).

3.7 Companies are more outward looking

There is evidence that companies are increasing their **connections** with other businesses, universities and support providers. The proportion of Wave 2 Longitudinal companies working with other businesses (including suppliers and customers) during the production/marketing(71%) and the growing business (75%) stages is higher than those in Wave 1 (56% and 61% respectively).

In the Wave 2 Longitudinal sample the proportion of companies working with **universities** increased across all Branscomb stages, with the biggest increase during the growing business stage i.e. from 34% in 2008 to 59% in 2011.

¹⁴ Defined by university spin outs only



In the Wave 2 New sample, a significantly higher proportion worked with **universities** during the proving the concept stage (76% compared to 50% for Wave 2 Longitudinal). As slightly over one third (37%) of the respondents were spin outs, this is not the key driver of this increase.

Companies were also drawing increasingly on support from **private sector specialists** and consultants; this peaked during the production/marketing stage.



The main driver for using the private sector was a **skills gap** – either through companies having insufficient finance to recruit the right calibre of individual fulltime or the company being unable to source someone within the product development timescales.

3.8 Public sector support remains crucial and has expanded beyond SE and Scotland

Public sector support (particularly SE) is viewed as contributing to successful development by the majority of respondents. With 94% of the longitudinal sample and 78% of the new sample currently **Account Managed** this is not surprising.

Companies are now increasingly linking with wider UK and international public sector agencies, such as the Technology Strategy Board (**TSB**), the Department for Business, Innovation and Skills (**BIS**), the Department for Energy and Climate Change (**DECC**), the National Institute for Health (**NIH**) and the NHS. The longitudinal sample has shown a slight increase (up to 23% accessing this support during production/marketing), however the new sample is making more use of the

UK public sector at an earlier stage, peaking at 35% during early stage market development.

There was no significant difference across sector and origin.

3.9 Companies need more money to get to the market and are funding this in various ways

The average cost for a company to reach the marketplace is rising. For the longitudinal sample in Wave 1 (2008) it was $\pounds1.5m$ rising to $\pounds2.1m$ in 2011. When reviewing the Wave 2 New sample this increases further to $\pounds3.8m$. This dramatic rise in the Wave 2 New sample will be influenced by the change in the types of companies SE now supports, i.e. more life science companies and spin-outs who have the potential to achieve a scale of impact but which require higher development cost.

Co	sts of stages –	Table 3.2		
Stage		Longi	New	
		Wave 1 2008 Wave 2 2011		Wave 2 2011
PC	min:max	£2.5k, £1.3m	£2.5k, £4m	£4k, £1.8m
	average	£275k	£3467k	£337k
	median	£150k	£150k	£200k
ESTD	min:max	£2.5k, £6.5m	£2.5k, £6.5m	£5k, £9m
	average	£380k	£468k	£976k
	median	£150k	£180k	£270k
PD	min:max	£2.5k, £1.5m	£2.5k, £5m	£5k, £9m
	average	£434k	£558k	£2.1m
	median	£250k	£262k	£300k
PM	min:max	£2.5k, £3m	£2.5k, £8m	£5k, £1m
	average	£391k	£701k	£398k
	median	£150k	£175k	£150k
Total average cost				
to rea	ch GB stage	£1.5m	£2 .1	£3.8m

As a result of the increased cost and the changing financial climate companies are now using a different mix of investment and finance sources to grow and develop their businesses, such that in Wave 2:

- private sector investment (VC, angel and banks) remained high with between 45% and 70% of businesses using this at various stages of development
 - more life sciences than enabling technologies companies were accessing private investment. This may be explained by their higher development costs
 - spin out companies accessed less private finance at early stages of development than non-spin outs; on reaching production/marketing stage this situation reversed. This may be because spin out overhead sand other costs are comparatively low when located on-site at a university
 - the Scottish Co-Investment Fund (SCIF) was the most frequently accessed investment, used by 42% of Wave 2 Longitudinal and 23% of the Wave 2 New samples – feedback on this investment stream indicated that this has been extremely valuable to companies, often leading to further equity investment from private investors

¹⁵ Note the consistently higher mean figures in comparison to the median, which describes a distribution skewed to the left (where more businesses respond at a level nearer the lower end of the cost spectrum and overall totals are influenced by a smaller number of high cost incurring businesses).

- banks were commonly cited during Wave 1, are now rarely used and no companies in the Wave 2 New sample accessed this route, many having been turned down for general bank finance and the new Enterprise Finance Guarantee Scheme (EFGS) or put off due to the higher risk associated with the scheme
- **public sector support** (grants, equity and loans), although fluctuating across the stages, remained the highest funding source overall, peaking during early stage technology development with 85% of the Wave 2 Longitudinal and 94% of the Wave 2 New sample
- the proportion of **company finance** (firm profits/cash flow) being reinvested increased as companies moved towards the growing business stage and were therefore generating sales. By 2011, 94% of the longitudinal sample was using company finance at the growing business stage compared to only 66% in 2008, suggesting an increased level of maturity in the sample
- **own money finance** was highest during the proving the concept stage (62% of Wave 2 Longitudinal); this decreased to 13% by the growing business stage. In Wave 1, over one third of business (36%) were still using own money at the growing business stage

In addition to the mix of finance sources used, the proportion of funding has also changed. This was most marked in the Wave 2 New sample which has accessed more public monies as well as more company finance. This is shown in Table 3.4. In the Wave 2 New sample the majority of public money is accessed at an early stage. While this money is often unmatched during the proving the concept stage by early stage technology development 100% is matched (60% private sector and 40% company/own money).

-			•	• •		
	Private	Public	Company	Own	Total	Average
Longitudinal	27.6	9.3	11.5	2.7	51.1	1.22
(42 respondents)						
New	25.6	17.1	13.0	1.8	57.5	2.21
(26 respondents)						

Total Funding overview – Wave 2 Longitudinal and New (£000s)¹⁶ Table 3.3

Table 3.3 shows that total funding across the Wave 2 samples has increased, with an average company in the new sample requiring $\pounds 2.21$ m compared to $\pounds 1.22$ m in the longitudinal sample.

In financing this increase, the amount of public funding has significantly increased from \$9.3m to \$17.1m (i.e. from \$222k to \$659k average per company). This higher level of public support is partly due to the new model of commercialisation which is targeting prospective 'high achievers' and therefore they are likely to need more money to reach their potential.

3.10 Time to product launch becoming more critical to companies

A difficulty cited across all stages was the **length of stage** being too long. The evidence supports this as it now takes an average of four to five months longer to reach the growing business stage across the full sample. Table 3.4 presents the average stage lengths in months across the samples, (a full breakdown showing maximum, minimum and median is provided in Appendix 4).

¹⁶ These figures are taken directly from the survey and are only based on figures provided by the companies.

Mean length of stage cut by sample

Branscomb Model Stage								
Sample	Proving the Concept	Early Stage Technology Development	Product Development	Production/Marketing				
	Months	Months	Months	Months				
Wave 2 - Longitudinal 2008	14	12	13	12				
Wave 2 - Longitudinal 2011	14	13	15	14				
Wave 2 - New	17	15	13	15				

The common reasons for stage length increase, in order of importance, were:

- sales and marketing skills gaps specifically during product development and production/marketing stages which slowed down products getting to market or in some cases resulted in companies staggering product launch
- technology took longer to get ready for the market because technical uncertainties increased the product development stage
- **technology skills gaps** technology skills gaps during early stage technology development and product development stages which increased the length of these stages
- **sales cycles** took longer than anticipated, through both setting up distribution channels and establishing the sales process
- **regulatory approval** took longer than anticipated, particularly for life sciences companies
- difficulty in finding partners/collaborators to support the development of the product

As 'time is money', increasing stage length is having a negative impact and has resulted in some companies running out of money, or having to source investment to the detriment of other business priorities.

In the Wave 2 longitudinal sample there was minimal difference in results by business origin, however across the new sample, **spin outs** indicated a shorter product development stage – 9 months compared to 13 for the overall sample. In contrast, the non-spin outs took on average 17 months to go through this stage. The difference at the product development stage may be due to the amount of early stage development that occurs within spin outs prior to company launch, thereby reducing the time further along their company journey. Alternatively, it may be that these spin outs have underestimated the time required, as half of this sample had only recently moved into this stage.

In the Wave 2 Longitudinal sample, **enabling technologies** companies were slightly quicker through all stages than **life sciences**. This confirms the Wave 1 findings which indicated that life sciences technologies take longer to develop due to the nature of the product, i.e. predominately human-focussed, and the need for regulatory approvals.

3.11 Lack of finance, skills gaps and technical and market challenges remain key issues

The majority of companies reported challenges at all stages of developing their businesses. Lack of finance – both in the form of investment and operating cash flow – was a common theme throughout. For the longitudinal sample in 2011, this problem peaked during the early stage technology development, and although gradually reducing over time, over one third (38%) still cited this during the growing business stage.



In the new sample, although proportionally lower, lack finance was the most commonly cited gap.

For those companies highlighting finance issues, the ability to raise both loans and equity finance were most frequently cited, with companies stating that, "banks were not lending to anyone". Although equity finance was accessible, companies indicated that this was taking longer than expected to negotiate, and that this was having a negative effect on the development of the product and cash flow. Lack of finance was also affecting the ability to attract and afford the right calibre of staff.

We were unable to draw conclusions at a sector or origin level due to the small respondent sample sizes.

In Wave 2 **skills barriers** peaked during product development and production/marketing stages. While technical skills gaps, for example design engineers or lead scientist, were cited across all stages, sales and marketing was the main gap during product development and production/marketing. In the Wave 2 New sample, sales and marketing gaps started to be cited during early stage technology development. It was at the product development stage before these were cited frequently in Wave 1.



Some examples of skill barriers included:

- recruiting sufficiently experienced and skilled design engineers
- a lack of engineering graduates with industry/practical experience
- a lack of graduates with good technical skills
- a lack of sales and business development skills

The most commonly cited **challenges** were technical, market and customer related issues

- technical mostly at the early stages this varied by sector, with many life sciences companies experiencing issues due to changing regulatory regimes, increased demand for clinical data set and trials – resulting in increases in the technology and product development stage length
- **market** this included the market not taking off &/or growing as "predicted", or the market still not being ready for the product. The impact of the recession was also viewed as a contributing factor. The fact that companies are now looking at markets earlier, and particularly the routes to market, suggests this challenge many be mitigated in the future
- customer many companies faced difficulties in making connection with customers until very late in their development process – resulting in costly and time consuming product re-engineering.



Some examples of technical uncertainties included:

- <u>'</u>big pharma' companies wanting more clinical trials data prior to signing any deals, and so companies are needing to take products a stage further in the clinical trials process which is costing more, requiring further investment to be raised
- set backs due to changing government regulatory regimes, and the adoption and policing of these.

3.12 Wide ranging benefits of support from SE

Almost all companies continued to cite benefits arising directly from SE support. Since the Wave 1 survey a higher proportion of companies report:

- improved skills increased from 36% to 71% of companies
- increased value of company increased from 32% to 60%
- increased sales increased from 25% to 58%
- quality of staff increased from 46% to 60%

Only three companies reported no benefits.

The nature of the **business based intangible assets** also changed in Wave 2 Longitudinal sample, with companies increasing growth plans, expanding their networks and improving their personal development plans. The main increases were:

- growth plans increased from 66% to 78% with biggest increases in strategy development, business plans and organisational vision
- networks increased from 49% to 76% with biggest increase in university affiliations, business and personal networks
- 66% now have some sort of intellectual asset inventory or portfolio (compared to 57%)

These changes are another sign that companies in Wave 2 Longitudinal sample are maturing.

Anecdotal feedback indicates that SE support has also helped in product development while facilitating new connections with clients and partners. Account managers, were also valued as being external sounding boards and "a voice of reason".

Some specific company feedback cited included:

- help with development of sales through support to find channel partners
- support to take forward a product portfolio (as opposed to a single product)
- assistance to develop a more robust company structure and business model
- invaluable organisational, leadership and staff development, enabling quicker progress than would have been possible otherwise

Respondent sample sizes were too small to report at a sector or origin level.

3.13 Evaluation of SE support

Companies were asked to rate the SE support at each Branscomb stage.

Across all stages between 80% and 89% of Wave 2 companies worked with SE because the support was **appropriate to company needs**; this is similar to Wave 1.

Over 80% rated **communication with SE** as good or very good across all stages and this has not changed from Wave 1.

Advice remains the highest rated service with around 90% rating this as good or very good from early stage technology development onwards. This appears testament to the support from both the HSGU advisors and Account Managers. Some companies stated that they would not be where they are now without the SE support, while others stated that they would no longer be trading.

Perceptions of the **promotion of SE support** remains similar to the 2008 sample, with 61% to 75% of companies rating this good or very good across the stages. The lowest was during the proving the concept stage. The proportion citing poor or very poor decreases as companies move towards the product development and production/marketing stages. This reflects the high proportion of companies that are Account Managed by the time companies are at these stages, and are therefore more aware of what SE has to offer.

The rating of **application and selection process** followed a similar pattern, with between 60% and 67% rating this as good or very good. Around 20% highlighted

that processes were bureaucratic across all stages, irrespective of Account Management support. This related mainly to grant applications.

It was noted by some that SE and SDI are responsive to company requirements, and quick to respond. Other positive comments included:

"great support - introductions and leads"

"very proactive"

"in terms of strategy and policy I feel we now going in the right direction as a result of the (SE) support"

Overall satisfaction with support received increased for the Wave 2 – longitudinal sample from 59% to 70% stating they were very satisfied; this increased further to 79% for the Wave 2 – New sample. In particular, respondents praised the support they had received from their Account Manager, with many saying their Account Manager was "excellent" or "very good". While appreciating that Account Managers were likely to change over time, the best relationships were those who had worked longest with their Account Manager – therefore building a better understanding of the needs of the company.

Some specific feedback included:

"delighted with support, always good and our Account Manager is great"

"SDI and SE are both very helpful – key is to have continuity of Account Management – helps in the relationship building and not having to go over the same ground multiple times"

"SE is very proactive; our Account Manager has introduced us to and helped us with investment; we are currently using SDI to help us set up an overseas office in the US"

"very satisfied with the support - excellent Account Manager"

"Account Manager is very good; the support has helped the company move in the right direction"

"SE has an experienced team - who know the market, they are very responsive"

4 Conclusions

The key findings from this chapter are:

- Companies are maturing they have moved into new markets, increased their networks, developed their management teams, have started to develop a second generation of new products, have started to invest from their own profits and become less reliant on SE
- Characteristics of the best performing companies are better understood despite the recession companies have grown their turnover, raised more investment and increased employment. The best performing companies are a small elite group with a clear focus on their customer, a commercially focused management team and with early sales
- Drivers, enablers and breaks on growth vary companies report challenges around sales and marketing skills gaps, the need to improve the commercial focus of the management team and technical challenges. SE Account Managers are viewed as essential in providing direction and support to help overcome these challenges
- Validation of SE's new approach to commercialisation there are clear signs that the re-focusing of SE's commercialisation approach is demonstrating early signs of greater impact. Evidence is also coming through that the single coordinated approach to advisory and funding support is appreciated by companies and is contributing to their future success and forecast impacts
- A substantial return on their investment for Scotland while the Wave 1 businesses currently deliver a return on investment for SE, the new companies have a greater long term potential
- Lessons for Scottish Enterprise the changes to the support structure for technology companies is already making a difference

4.1 Companies are maturing

Companies are not only growing, they are maturing. This is evidenced in a number of ways:

- <u>the move into new markets</u> companies are using the support from their Account Manager and SDI, along with their previous experience, to improve their reach in new markets, evidenced by higher levels of both exporting and internationalisation
- <u>business linkages increasing</u> companies are broadening their linkages and networks, reconnecting with universities, using private sector consultants (including to fill skills gaps) and widening supplier relationships
- <u>companies are investigating routes to markets earlier</u> companies were noted to focus more on routes to market at an earlier stage – this is observed particularly within the Wave 2 new sample, and aligns with the changing SE commercialisation strategy
- <u>expansion of management and leadership teams</u> is a notable change since 2008, with several examples of companies doing this and signs that the Wave 2 new sample companies are focusing on management team capability at an earlier stage
- <u>companies are starting to develop new products and services</u> many of the companies that have reached the growing business stage have

already started to develop their second phase of *new* products and services

- relationships with SE and the public sector have changed SE has been a constant factor in the majority of longitudinal companies, from the early support of the HGSU and the subsequent on-going support from their Account Manager. However, the support has expanded into SDI as companies seek to enter new markets. This is also happening earlier in the new sample. As funding tightens across the public sector, companies are seeking support beyond Scotland from UK and European sources
- <u>financial relationships changing</u> companies now have less reliance on banks (by necessity as a result of the banking crisis) and are focussing on private investment, including angel and VC finance to help fund their development. As companies start to grow and generate revenue the level of internally generated finance has increased. Companies use SE through the Scottish Investment Bank (SIB) to access a range of investment products; some companies are accessing the same investors directly without the SE link

4.2 Characteristics of the best performing companies

Company performance should be considered in the context of recession and sluggish recovery of the Scottish economy since 2008. Scottish GDP growth was negative for eight quarters between Q4 2008 and Q3 2010, including four quarters where the economy shrunk by 3.3% - 4.3% year on year¹⁷. Growth was a low 1.3% year on year, in Q1, 2011. Furthermore, employment in Scotland was 2.605 million in 2008 and fell by 5.9% to 2.452 million in 2010¹⁸. The employment rate (16-64 year olds) fell from 74.3% (Apr-Jun 2008) to 71.9% (Apr-Jun 2011).

Despite this economic environment, the majority of the longitudinal companies have shown evidence of growth at three levels:

- <u>Turnover</u> actual total turnover increased by over 64%, with a median increase of £600k per annum up from £311k per annum in 2008
- <u>Investment</u> rose from £38.6m to £74.1m in 2010 (increase of 92%) across the longitudinal sample
- <u>Employment</u> despite the impact of the recession, the longitudinal sample has increased 15% in employment since 2008

The best performing companies (those driving impact across the sample) are a small elite group, representing 5% of the total sample, which have exhibited the following set of characteristics:

- several periods of episodic growth their growth is not linear or sustained and periods of growth are triggered by substantial change, for example entering a new market or a change in leadership
- early market focus and customer engagement the best performing companies tend to be those who are most market-focused at the earliest stage in their evolution. They have built connections with customers and have achieved their first sales early
- building the management team the best performing companies tend to have the most commercially focused management teams. There is a growing recognition of the need to boost the capacity of the management team at an earlier stage of company development
- **finance and investment** difficulties accessing finance continue to be the principal brake on development. The best perfoming companies have not

¹⁷ Annual GDP Growth Rates, Scottish Government, 2011

necessarily received the highest levels of investment but they seem to have had sufficient finance at key stages in their development

 technology development – the best performing companies have dealt with this challenge while simultaneously developing a marketable product(s) which customers want to purchase

4.3 Drivers, enablers and breaks to growth and how they can be overcome

The research has shown that the growth of supported technology businesses has numerous drivers, enablers and brakes, all of which need to be considered when designing support:

Drivers – the main driver for the large majority of companies is finance, to fund both day-to-day operations and future growth. Another driver is market focus, as opposed to technology focus. The new sample is demonstrating this earlier than its longitudinal counterpart, with a higher proportion of companies focusing on routes to market from early-stage technology development. Reflecting on what companies would do differently, they commonly said they would have looked at the market sooner.

Enablers – the ability to make early sales is a key enabler as it brings credibility in the market and confidence to the sales team. International sales, supported by good international distribution channels are also enablers. Support from SE through HGSU and Account Managers, and from SDI, helps companies establish, develop and grow. Without this support company progress would be slower.

Brakes – lack of finance, particularly bank finance, was cited almost unanimously as the key barrier to growth. Despite this, average investment levels per company have risen. The replacement of the Small Firms Loan Guarantee Scheme (SFLGS) by the Enterprise Finance Guarantee Scheme (EFGS) was viewed as a constraint because the risks to the company owners were heightened, reducing uptake. The need for earlier and bigger investment was highlighted as a brake by in those cases some Life Sciences companies, especially those that work with 'big pharma'. In those case, companies needed to take ideas closer to fully functioning products before 'big pharma' would commit to development funding and licensing. Companies reported, however, that this would result in more value in the product in the longer term.

Companies also reported a number of development needs to help them overcome the range of challenges to the growth of their businesses. Their most common needs are:

- sales and marketing skills gaps are cited throughout the findings. By developing the management team and recruiting director level staff, companies expect this gap to reduce over time
- increased commercial focus in the management and leadership team was viewed as a key issue during Wave 1. However, change in the SE commercialisation approach appears already to be delivering improvements in this area. The new sample companies are considering this issue earlier in their development and the longitudinal sample has increased its recruitment and training focus to overcome this issue
- **technical challenges** continue and as the company develops and starts to create new products these are likely to increase. The expansion of business and technical networks, and specifically the increased links with universities, has the potential to minimise this

Account Management support has been essential in the growth and development of companies. They provide sounding boards as well as support and direction when companies are going through periods of difficulty. They have linked many respondent companies to SDI, which provided essential support in the growth and internationalisation of supported technology companies. This support was viewed as essential in helping companies overcome challenges.

The majority of companies interviewed cited the recession as having an adverse impact on their growth. This has reduced demand for their goods & services and constrained bank finance for investment, which has reduced considerably since the Wave 1 study. In contrast the level of venture capital financing increased.

4.4 Validation of SE's new approach to commercialisation

There are clear signs that the re-focusing of SE's commercialisation approach is demonstrating early signs of greater impact.

Evidence is also coming through that the single coordinated approach to advisory and funding support is appreciated by companies and is contributing to their future success and forecast impacts.

Almost all companies cite benefits arising directly from the wider support they have accessed from SE. Companies have attributed increased company value, increased sales, improved skills and a more robust product portfolio as direct benefits from SE support.

As yet, few companies supported have reached either the investment or turnover targets established as part of the new approach in 2008, namely £10m investment or £5m turnover¹⁹. These benchmarks were set high to differentiate those companies with the potential to achieve scale of impact. Since 2009 SE has prioritised support to those projects with the strongest potential to achieve this scale-up within 5 years from first round investment and/or first significant sales.

From the full sample of 84 companies in Wave 2, four companies have met the investment criterion (of these, three are from the new sample) and one company meets the turnover criterion.

This high level of investment in companies in the new sample is a positive sign that companies are raising significant levels of investment and that investment targets will be met by a substantial number of firms. And currently, seven companies from the Wave 2 New sample that are projected to meet the turnover criteria. A further two will meet the criteria, but will take slightly longer.

There are also four Wave 2 New companies that could meet the investment criterion in terms of value, but will take longer than 5 years to do this.

4.5 Substantial return on the SE investment for Scotland

SE support for technology companies is estimated to be generating increasing value for the Scottish economy, having increased significantly since the initial Review in 2008. The 'returns' to the public sector purse after 10 years are estimated to be as follows: (mid-point estimates of) $\pounds 6.1$ and $\pounds 8.2$ respectively for each $\pounds 1$ spent for the Wave 2 Longitudinal and Wave 2 New company cohorts.

The majority of impacts are driven by a small number of start-up companies in the Enabling Technologies. However, there is a gradual increase in the contribution from spinout companies and Life Science businesses predicted from 2016 onwards.

¹⁹ These turnover projections are unadjusted for optimism bias

4.6 Policy lessons for Scottish Enterprise

The findings and conclusions suggests that SE has already learned from its previous technology company support programme, and that it has made appropriate changes in its new support programme by focusing on four key areas.

In this regard, SE is already focusing its support on a much smaller group of high growth potential companies. It is suggested that SE and SDI should continue to critically appraise the potential and progress of existing and potential new clients, including their willingness to implement change likely to facilitate growth and increase or reduce support as appropriate on a company-by-company basis.

While SE's current investment and turnover targets seem challenging, with few companies in the Wave 1 and Wave 2 samples achieving them, the potential in the Wave 2 New sample is promising. The role of SE in supporting companies in achieving this cannot be underestimated.

Despite the substantial support available to, and accessed by, companies, two significant barriers to growth have emerged that require further investigation to assess how they might to be addressed:

- Increased difficulty in securing external investment, especially at the later stages of getting products ready for the market; and
- New forms of support targeted helping to improve marketing capability, to better understand their customers and to de-risk the test and demonstration of products.

Appendix 1

Company Profiles

Wave 1 – 2008 - not interviewed as part of the study

Note that sectoral profiling was as per the company's main business sector and not as per SIC classification – this fully aligns with the approach taken in Wave 1.

Company Name	What business stage were you on in 2008	Spin Out	Sector	Account Managed	Status
3MRT	4	No	Enabling Technologies	yes	Acquired
Accura Healthcare	5	No	Life Sciences	yes	Active
Aptuit	5	Yes	Life Sciences	yes	Active
Big DNA	2	Yes	Life Sciences	yes	Dissolved
Boreas	1	No	Energy	yes	Active
Calton Hill	3	No	Enabling Technologies	yes	Dissolved
Calvatec	2	No	Enabling Technologies	yes	Active
Centeo Biosciences	2	Yes	Life Sciences and Enabling Technologies	yes	Active
Cheetah Advanced Technology	5	No	Enabling Technologies	yes	Active
Ciqual	2	No	Enabling Technologies	yes	Active
Cohort Studios	5	No	Enabling Technologies	no	Dissolved
Dem Solutions	4	No	Enabling Technologies	no	Active
Denfotex	5	No	Life Sciences	yes	Acquired
Dharmacon - Thermo Scientific Genomics	2	Yes	Life Sciences	yes	Dissolved
Dynamic Innovations	4	No	Life Sciences	no	Dissolved
Ectopharma	1	No	Life Sciences	no	In default
Environmental Building partnership	3	Yes	Other	no	In default
Eologic	4	Yes	Enabling Technologies	yes	In liquidation
Hydrosense	3	No	Life Sciences	yes	Dissolved
Immunosolv	4	Yes	Life Sciences	yes	Active
Infiniti	5	No	Enabling Technologies	yes	Active
Intellevation	5	No	Enabling Technologies	yes	Active
Inxstor	3	Yes	Enabling Technologies	yes	In liquidation
Kelvin Connect	5	No	Enabling Technologies	yes	Active
Lab 901	4	Yes	Life Sciences	yes	In receivership
Lutess Ltd	3	No	Life Sciences	no	Dissolved
MOBIQA	5	Yes	Enabling Technologies	yes	In liquidation
NXVision Ltd	2	No	Enabling Technologies	yes	In liquidation
Ovisor Technologies	1	No	Enabling Technologies	no	Dissolved
Plurion	2	No	Energy	no	
PWB Healthcare Ltd	4	No	Life Sciences	yes	In liquidation
Quantum Filament Technologies	2	Yes	Enabling Technologies	yes	Dissolved
Rapid Mobile Media Ltd	3	Yes	Enabling Technologies	yes	Active
Real Innovations (RealismaOptical)	4	No	Enabling Technologies	no	Active
Red Spider Technology	4	No	Energy	yes	Active
Scalar Technologies	4	No	Enabling Technologies	yes	Active
SFX Technologies	4	Yes	Enabling Technologies	yes	Active
SMAR - Azure	5	No	Enabling Technologies	yes	Active
Spiral Gateway	3	Yes	Enabling Technologies	yes	In liquidation
SST Sensing Ltd	4	No	Enabling Technologies	yes	Dissolved
St Andrews Fuel Cells Limited	2	Yes	Energy	yes	Active
Sutherlands Edinburgh Ltd	4	No	Enabling Technologies	yes	Dissolved
The Medical Phone Company	0	No	Enabling Technologies	yes	Active
Xanic	2	Yes	Enabling Technologies	yes	In liquidation
XI Power	3	No	Enabling Technologies and Energy	no	Dissolved
Xicon Ltd	5	No	Other	yes	Active
York EMC	5	No	Enabling Technologies	no	Active
Zero-ed In Ltd	4	No	Enabling Technologies	no	Insolvent

Wave 2 – Longitudinal 2008 - 2011

Company Name	What business stage were you on in 2008	What business stage are you now at?	How many stages have you progressed?	Spin Out?	Sector	Account Managed?
BiP Solutions	5	5	0	No	Other	yes
Aetia Solutions	5	5	0	No	Enabling Technologies	no
Avotec	5	5	0	No	Enabling Technologies	yes
Albagaia	2	3	1	No	Life Sciences	yes
Veracity UK Ltd	5	5	0	No	Enabling Technologies	yes
Intrallect	5	5	0	No	Enabling Technologies	yes
Photosynergy	3	3	0	No	Energy	yes
Affective Media	2	3	1	Yes	Enabling Technologies	yes
Wide Blue	5	5	0	No	Enabling Technologies	yes
Brainwave Discovery	4	5	1	Yes	Life Sciences	yes
Factonomy Ltd	4	5	1	Yes	Enabling Technologies	yes
Novabiotics	3	4	1	No	Life Sciences	ves
Ocutec	3	3	0	No	Life Sciences	ves
Amphotonix (Kamelian)	4	4	0	Yes	Enablina Technologies	ves
Formedix	5	5	0	No	Life Sciences and Enabling Technologies	yes
Memstar Limited	5	5	0	No	Enabling Technologies	yes
Gas sensing Sloutions	3	5	2	No	Enabling Technologies	ves
Thinktank Maths Ltd	3	5	2	Yes	Enabling Technologies	yes
Spinsight	1	4	3	Yes	Enabling Technologies	yes
Flexpansion	3	3	0	Yes	Enabling Technologies	yes
Giltech	5	5	0	No	Enablina Technologies	ves
Deep Casing Tools (formerly Futuretec)	1	2	1	No	Energy	yes
Ingenza	5	5	0	No	Life Sciences	yes
Arrayjet	5	5	0	Yes	Life Sciences	yes
Avanticell	3	5	2	Yes	Life Sciences	yes
C2 Software	5	5	0	No	Enabling Technologies	yes
Stevenson - Reeves Ltd	5	5	0	No	Enabling Technologies	yes
Ice Robotics	3	4	1	No	Enabling Technologies	yes
Cellucomp	3	3	0	No	Enabling Technologies	yes
Conjunct	3	4	1	No	Enabling Technologies	yes
Biopta	4	5	1	Yes	Life Sciences	yes
Cytosystems Ltd	1	2	1	No	Life Sciences	yes
Dimensional Imaging	4	5	1	Yes	Enabling Technologies	yes
Technology M Saurel/M2 Lasers	4	5	1	No	Enabling Technologies	yes
Ceannard Limited	5	4	-1	Yes	Enabling Technologies	no
Dundee Cell Products Ltd	4	5	1	Yes	Life Sciences	yes
Xeroshield Ltd	1	1	0	Yes	Life Sciences	yes
Nessco	5	5	0	No	Enabling Technologies	yes
3D Visual Simulations Ltd	5	5	0	No	Enabling Technologies	no
emblation medical	2	3	1	No	Life Sciences and Enabling Technologies	yes
Design LED	4	4	0	Yes	Enabling Technologies	yes
Reactec (spin out)	4	4	0	Yes	Enabling Technologies	yes
CXR Bioscience	5	5	0	No	Life Sciences	yes
Lazy Day Foods	4	5	1	No	Other	yes
Waracle	2	4	2	No	Enabling Technologies	yes
Artilium	5	5	0	No	Enabling Technologies	yes
Calnex Solutions	4	5	1	No	Enabling Technologies	yes
E-Com	5	5	0	No	Enabling Technologies	yes
Fios Genomics	2	5	3	Yes	Life Sciences and Enabling Technologies	yes
Lux Assure	5	2	-3	No	Energy	yes
Strathkelvin instruments	5	5	0	No	Life Sciences	yes
Proctor Group	5	5	0	No	Other	yes

Wave 2 – New

Company Name	What business stage are you at	Spin Out	Sector	Account Managed
Almac Sciences Limited	5	No	Life Sciences	No
Anarkik 3D	2	Yes	Enabling Technologies	Yes
Blackford Analysis	3	Yes	Enabling Technologies	Yes
Catalent	5	Yes	Life Sciences	No
Cellartis	3	No	Life Sciences	Yes
Company X	1	No	Life Sciences	No
Deliverics	4	Yes	Life Sciences	Yes
Destina Genomics	2	Yes	Life Sciences	No
Ecometrica	5	No	Enabling Technologies	Yes
Edinburgh Instruments	5	No	Enabling Technologies	Yes
Energyflo	4	No	Other	Yes
Flexicage Ltd	3	Yes	Enabling Technologies	Yes
Funky Moves	4	No	Enabling Technologies	Yes
12eye Diagnostics	2	Yes	Life Sciences	Yes
Intelligent Flow Solutions	2	No	Other	Yes
Ipsox (Insulin Pump Sox)	5	Yes	Life Sciences	Yes
Metaforic	4	No	Enabling Technologies	Yes
Mobile Acuity	4	Yes	Enabling Technologies	Yes
Neuro Org	3	Yes	Other	Yes
NGenTec	2	Yes	Energy	No
Ohmedics	4	Yes	Life Sciences	Yes
Power Photonic	4	No	Enabling Technologies	Yes
Procenseo	3	No	Enabling Technologies	Yes
Pyreos	4	Yes	Enabling Technologies	Yes
Quest Robotics	2	Yes	Energy	No
Quorate	2	No	Enabling Technologies	Yes
Renishaw Diagnostics	3	No	Life Sciences	Yes
Scottish Agricultural College	5	No	Life Sciences	No
Taconic Artemis	4	No	Life Sciences	Yes
TES	5	No	Enabling Technologies	Yes
Traak Systems	4	No	Enabling Technologies	No

Appendix 2

Detailed Economic Impact Assessment

Introduction

This section details the economic impacts resulting from the SE Commercialisation Programme of support to both Wave 2 Longitudinal and Wave 2 New companies over a ten year horizon, namely:

- between 2004/5 and 2013/14 for companies in the Wave 2 Longitudinal sample
- between 2008/9 and 2017/18 for companies in the Wave 2 New sample

Approach to Assessing Economic Impact

The economic impact estimates are based on SE best practice guidance and discussions with the SE Appraisal and Evaluation team, and are built on the evidence gathered from clients using the standard SE question set for assessing economic impact. Following collection of key impact variables the following tasks were undertaken:

- adjustment for consistent pricing
- discounting costs and benefits to a base year
- adjustment for optimism bias
- gross to net calculations, via making adjustment for additionality (deadweight, leakage, displacement, substitution and multipliers)
- adjustment for business failure and acquisition
- grossing up impact from sample to population

Full details of the impacts for all years are provided in Appendix 5.

Businesses supported and costs incurred

Wave 2 Longitudinal businesses

SE assisted 1,306 clients through its support to Wave 2 Longitudinal businesses in 2008 (for consistency, on account of difficulty in determining a full population number, this total was assumed back to 2004 – year 1 of the longitudinal exercise). From 2008 on population adjustments are made for business failure (at a rate of 10% per annum) and acquisition (at a rate of approximately 1.5% per annum). This revises the number of companies supported to 483 by 2017. These adjustments are based on recent research from the Department of Business Enterprise and Regulatory Reform and the University of Glasgow's Training and Employment Research Unit respectively, and are consistent with the failure and acquisition trends observed across the sample between 2008 and 2011.

The cumulative cost of supporting these companies has increased from $\pounds7.4$ million in 2004 to $\pounds112.8$ million in 2010. By way of illustration this equates to a cumulative cost per business to SE of $\pounds5.7k$ in 2004, rising to $\pounds107.7k$ in 2010²⁰. N.B. No further expenditure beyond 2010 has been assumed; were further support to be provided in the future, impact: cost impact ratios would fall.

²⁰ As the commercialisation programme is designed to offer up-front investments in anticipation of a long term return, cumulative cost per job provides a more appropriate measure than year on year cost per job for this programme
				IUDIE AZ. I
	Year 1 2004/5	Year 3 2006/7	Year 5 2008/9	Year 7 2010/11
Businesses supported	1,306	1,306	1,306	1,047
Costs incurred (cumulative)	£7.4m	£47.0m	£97.7m	£112.8m
Cost per business (cumulative)	£5.7k	£32.0k	£74.8k	£107.7k

Costs of Wave 2 Longitudinal business support and number of businesses supported Table A21

Wave 2 New businesses

For the Wave 2 New business cohort, SE focussed its support to 323 companies between 2008/9 and 2011. The same assumptions as in the Wave 2 Longitudinal sample for business failure and acquisition beyond 2010/11 have been applied. This revises the number of Wave 2 New businesses in 2017/18 to 149.

The more 'selective' approach to company commercialisation support has been coupled with more intensive support to these Wave 2 New businesses, particularly in the early years. The cumulative cost of supporting these companies has increased from £32.1 million in 2008/9 to £37.1 million in 2010/11, with the cumulative cost per business supported rising from £99.4k in 2008 to £114.7k in 2010. N.B. Again, no further expenditure beyond 2010/11 has been assumed; were further support to be provided in the future, impact: cost impact ratios would fall.

Costs of Wave 2 New business support and number of businesses supported Table A2.2

	Year 1 2008/9	Year 3 2010/11
Costs incurred (cumulative)	£32.1m	£37.1m
Cost per business (cumulative)	£99.4k	£114.7k

Impact adjustments

Wave 2 Longitudinal businesses

The key assumptions from the GVA estimations are summarised in Table A2.3 below.

Key assumptions: wave 2 Longituainal sample GVA impact				
GVA	Year 1 2004/5	Year 3 2006/7	Year 5 2008/9	Year 10 2013/14
Optimism bias	0%	0%	0%	27%
Deadweight	96%	93%	85%	82%
Leakage	0%	0%	0%	0%
Displacement	9%	9%	9%	16%
Substitution	0%	0%	2%	2%
GVA Multiplier	1.5	1.5	1.6	1.5
Grossing factor (to population) ²¹	7.2	9.2	10.2	5.7
Discount factor (STPR)	1.00	0.93	0.87	0.73

²¹ To avoid over-counting of impact for the years '40-'08 grossing was based on a variable of numbers of interventions accessed, while from '08-'11 the methodology was based on variables addressing sample to population ratios and proportion of costs incurred

This shows that:

- as all GVA impact information provided by companies for the years prior to 2010 was based on actual observed turnover and cost of sales, no optimism bias was applied. However, an **optimism bias** factor of 27% was applied to the 2013/14 figure²². This was because the businesses interviewed predicted, on average, a 27% higher level of turnover per employee than the average for their respective sectors²³
- high levels of deadweight have been calculated in the majority of cases as the businesses interviewed stated that they would have generated most or all of the GVA anyway in the absence of SE support. Deadweight assumptions decreased over time, as the proportion of businesses receiving intensive support grew
- as the impact survey questions related only to impact generated within Scottish-based operations, zero **leakage** was assumed in all years
- low average levels of displacement suggest that support is, in the main, not supporting growth at the expense of other Scottish-based businesses (likely to a great extent on account of the novel nature of product/service development)
- a substitution adjustment was made to any business which replaced one form of activity with another solely to benefit from public sector support; this occurred in few cases and adjustment was marginal
- a GVA multiplier²⁴ was applied to account for indirect and induced impacts that may accrue to the Scottish economy, i.e. supply chain impacts and wage effects within the economy. These assumptions were based on Type II GVA sectoral multipliers presented in Scottish Government Input-Output tables²⁵, which typically ranged between 1.5 and 1.7 (i.e. total impacts to Scotland are c50%-70% above those estimated at the company level)
- aggregate impacts were **grossed** up from sample to total population using a formula which combined percentage share of total business base and percentage share of total SE expenditure
- **Social Time Preference Rates (STPR)** of 3.5%, as advised by HM Treasury, were applied to costs and impacts, setting 2004 as the base year, in recognition that benefits are valued more highly in the present than in the future

(ey assumptions: Wave 2 Longitudinal sample employment impact				Table A2.4
Employment	Year 1 2004/5	Year 3 2006/7	Year 5 2008/9	Year 10 2013/14
Optimism bias	0%	0%	0%	27%
Deadweight	95%	85%	81%	79%
Leakage	0%	0%	0%	0%
Displacement	6%	5%	17%	7%
Substitution	0%	0%	0%	0%
Employment Multiplier	1.7	1.6	1.6	1.6
Grossing factor (to population)	3.1	5.7	12.1	5.9

The same approach with slightly different assumptions was applied in the employment impact modelling:

²⁴ average multiplier effect figures presented can change year on year depending upon which companies with which multiplier effects are driving total impact

²² This is based on comparing the GVA impacts anticipated by each business with those which they would receive should their employment forecast hold, and should they operate at the average labour productivity level for the best performing businesses in their sector. Where this produced a lower GVA value, any differences were treated as optimism bias and removed. Full details of our methodological approach to optimism bias are provided in Appendix 6.

²³ In comparing observed 2010 turnover in the longitudinal sample with the 2010 turnover forecasts for these companies in the Wave 1 interviews we noted that actual turnover in this year was 65% below that initially predicted. However, we have used a lower optimism bias assumption than this for two reasons a) the Wave 1 survey was undertaken at the onset of a global recession, and b) much of this differential was attributed to time optimism, where the business predicted the volume of orders they would receive with reasonable accuracy, but misjudged how quickly they would be able to complete their sale).

²⁵ http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads

- in 2013 optimism bias was estimated at 27%²⁶, while in most other years a lower optimism bias factor was applied to the employment model, as employment forecasts tended to appear less over-optimistic than GVA ones
- **deadweight** adjustment is based on the proportion of employment that businesses attributed to SE support; employment deadweight observed was lower than GVA deadweight observed
- leakage was again applied at 0%
- the same displacement assumptions were applied to each business as with the GVA calculation (see above); the overall weighted-average displacement assumption was lower however, on account that the businesses reporting greatest employment impacts tended to report lower levels of displacement than those reporting high levels of GVA impact,
- none of the businesses interviewed reported any employment **substitution** so no adjustment was made
- Type II sectoral **employment multipliers** from the Scottish Government Input-Output tables were again applied, yielding indirect and induced impacts of typically c60%-70% above those estimated at the company level
- identical grossing factors were assumed on a business-by-business level in the employment impact estimation. The weighted average tended to differ yearon-year depending upon whether the employment impacts were dominated by businesses that were part of the ITI programme or not

Wave 2 New businesses

Table A2.5 summarises the key assumptions made in the Wave 2 New sample GVA impact model:

Key assumptions: Wave 2 New sample GVA impact				
GVA	Year 1 2008/9	Year 3 2010/11	Year 5 2012/13	Year 10 2017/18
Optimism bias	0%	0%	5%	52%
Deadweight	99%	95%	87%	85%
Leakage	0%	0%	0%	0%
Displacement	4%	1%	1%	1%
Substitution	0%	0%	0.2%	0.2%
GVA Multiplier	1.6	1.6	1.6	1.6
Grossing factor (to population)	2.4	3.3	4.3	4.9
Discount factor (STPR)	1.00	0.93	0.87	0.73

- **optimism bias** has been applied from year 4 onwards (2011/12). As with the Wave 2 Longitudinal sample, optimism bias increases over time as client turnover projections become based on increasingly limited information. Unsurprisingly the level represented at year 10 will be higher than for the earlier cohort on account of the difficulty in projecting turnover data and the greater number of years of unrealised data
- **deadweight** assumptions are marginally higher (in the case of the Wave 2 New businesses), meaning that the businesses apportion a slightly lower proportion of their impact to SE support. This may mean that the programme now supports more resilient businesses that are less dependent on state subsidy
- zero leakage was again assumed

²⁶ This is based on the converse methodology of comparing the employment impacts anticipated by each business with those which they would receive should their GVA forecast hold, and should they operate at the average labour productivity level for the best performing businesses in their sector. Where this produced a lower employment value, any differences were treated as optimism bias and removed. The effective outcome of this cautious approach is to apply an optimism bias adjustment to either the employment or the GVA forecast of every business in the sample. It should be noted that the fact that both figures in 2013 were 27% was purely coincidental

- lower levels of displacement were identified among the Wave 2 New companies, which may reflect a refocusing of commercialisation support towards more knowledge intensive, export oriented sectors of the economy
- **substitution** was negligible amongst Wave 2 New businesses
- **multiplier** adjustments are slightly higher for Wave 2 New businesses, implying that these businesses operate within sectors with better developed or higher value supply chains across Scotland
- lower grossing factors were applied to the Wave 2 New sample because higher proportions of the total client population were interviewed for this cohort
- 2008 was set as the base year for the Wave 2 New sample, with Social Time Preference Rates (STPR) applied to future impacts beyond 2008

Key assumptions: Wave 2 New	Table A2.6			
Employment	Year 1 2008/9	Year 3 2010/11	Year 5 2012/13	Year 10 2017/18
Optimism bias	0%	0%	13%	5%
Deadweight	89%	85%	81%	85%
Leakage	0%	0%	0%	0%
Displacement	1%	1%	2%	2%
Substitution	0%	0%	0%	0%
Employment Multiplier	3.0	2.3	1.5	1.5
Grossing factor (to population)	3.3	4.1	3.6	5.0

Key assumptions in the Wave 2 New sample employment model were as follows:

- **optimism bias** was estimated using the same methodological approach as in the Wave 2 Longitudinal model (see above); again this produced lower optimism bias projections for employment than for GVA. It would appear that these businesses were less optimistic about employment forecasts than turnover relative to the best performing businesses in their sector
- employment deadweight was again below GVA deadweight in the Wave 2 New business sample
- zero leakage and employment substitution were again assumed; the evidence also suggested lower levels of displacement than in the longitudinal sample
- **multipliers** were again higher amongst the Wave 2 New businesses than in the Wave 2 Longitudinal cohort
- grossing factors were again lower, reflecting the higher proportion of client population interviewed

GVA Impact and impact ratios

The tables below summarise the GVA impact assessment of the commercialisation programme. Based on survey evidence and the assumptions and methodology described above, findings are subject to margins of error calculated to be +/- 17% for the Wave 2 Longitudinal population (1,306 businesses) and +/- 14% for the Wave 2 New population (323 businesses)²⁷. Note: These margins reduce over time as the populations reduce. For reasons of complexity annual margins of error are not listed here. As such the impacts set out represent the mid-point estimates of the range.

²⁷ These figures are based on the ratio between interviewed and non-interviewed companies in year 1 of the programme, and a 95% level of significance

Wave 2 Longitudinal businesses

In year 1 of the programme (2004/5), net additional GVA impact is estimated at \pounds 13.0 million (PV) which, when compared to the £7.4 million cost incurred, equating to a return of $\pounds 1.75$ per $\pounds 1$ of SE money invested.

By year 10 (2013/14), cumulative impact of SE support is estimated to rise to $\pounds 630.7$ million net additional GVA (PV) which, when compared to the cumulative cost of £103.0 million, equates to a return of £6.13 per £1 of SE money invested.

Wave 2 Longitudinal Sample GVA impact			Table A2.7	
	Year 1 2004/5	Year 3 2006/7	Year 5 2008/9	Year 10 2013/14
GVA impact for year (£m)	13.0	39.1	124.1	109.8
Cumulative GVA impact (£m)	13.0	85.7	268.0	759.7
Cumulative GVA impact (£m, PV)	13.0	82.0	242.6	630.7
Cumulative costs (£m)	7.4	47.0	97.7	113.7
Cumulative costs (£m, PV)	7.4	45.0	90.2	103.0
Impact ratio (£, PV)	1.75	1.82	2.69	6.13

Wave 2 New businesses

Many more businesses in the Wave 2 New sample were still pre-revenue in year 1 (in comparison to the more established previous cohort at this same stage) and overall the average age was younger than in the Wave 2 Longitudinal sample. £1.1 million (PV) net additional GVA impact was estimated in year 1, and the impact: cost ratio in year 1 was estimated at £0.03 for every £1 of SE money invested.

However, the Wave 2 New businesses experienced rapid growth in the first four years of the programme, while the level of additional SE support invested in each year began to fall. Net additional GVA is estimated to rise to $\pounds 37.2$ million (PV) by year 10, and the impact: cost ratio is estimated to rise to £8.23 back from £1 invested by SE by year 10.

Wave 2 New business sample GVA impact				Table A2.8
	Year 1 2008/9	Year 3 2010/11	Year 5 2012/13	Year 10 2017/18
GVA impact for year (£m)	1.1	6.0	41.8	37.2
Cumulative GVA impact (£m)	1.1	9.8	73.0	380.1
Cumulative GVA impact (£m, PV)	1.1	9.3	65.1	303.9
Cumulative costs (£m)	32.1	37.1	37.2	37.2
Cumulative costs (£m, PV)	32.1	36.8	36.9	36.9
Impact ratio (£, PV)	0.03	0.25	1.76	8.23

Year on year comparison

Figure A2.1 shows how the return on investment (cumulative, discounted net additional GVA divided by cumulative, discounted costs) delivered by the programme changes over time by calendar year. It shows that:

the return on investment delivered by both samples is expected to increase considerably over the next 10 years

- while the Wave 2 Longitudinal sample of businesses currently delivers a higher return on investment for SE (in 2010/11 mainly because of the maturity of the business cohort), the Wave 2 New companies have greater long term potential, and their return on investment is expected to exceed that of the Wave 2 Longitudinal sample from 2017/18 onwards²⁸
- note in the Wave 2 Longitudinal sample the 'kink' in growth at 2007/8. This is
 partially attributable to the change in the methodological approach to
 grossing from this point²⁹, and partly to a number of businesses commencing
 trading
- the 'full population' line closely follows the pattern of 'longitudinal companies' line. This is because these companies make up the majority of the total population of supported companies
- the 'new companies' line increases at a steeper gradient from 2010 onwards, indicating, in comparison, more rapid growth
- impacts match SE's current levels of potential performance, that "every £1 of operational spend in 2011-12 could generate an additional economic impact (GVA) of between £6 to £9 for Scotland over the next ten years"³⁰

Cumulative discounted cost impact ratios across Wave 2 New, Wave 2 Longitudinal and combined samples (by calendar year) Figure A2.1



Figure A2.2 shows the same impact: cost ratio data re-based (to programme start year) for ease of comparison. This better highlights the steeper impact gradient of the Wave 2 New company cohort. Considering the mid-point estimates for economic impact it shows that the Wave 2 Longitudinal sample will generate higher levels of impact in years 1 to 6, with the Wave 2 New sample recording higher impact from year 7 onwards.

²⁸ In this figure, a 2004 base year for the longitudinal sample and full population, and a 2008 base year for the new business sample, are assumed

²⁹ To avoid over-counting of impact for the years '40-'08 grossing was based on a variable of numbers of interventions accessed, while from '08-'11 the methodology was based on variables addressing sample to population ratios and proportion of costs incurred ³⁰ Scottish Enterprise Business Plan 2011/2014



Cumulative discounted cost impact ratio across Wave 2 New and Wave 2 Longitudinal samples (programme year) Figure A2.2

Breakdown of sample impacts

This section provides evidence on impact by business types.

Top performing companies

In an attempt to understand the distribution of impact across the two samples it was identified that the five top contributors - based on their projected net attributable additional GVA contribution - to Scotland in 2021 may account for almost half of the impact across the samples in that year. Clearly there are a number of outright 'successes', while the majority of businesses are offering moderate growth.

Figure A2.3 shows that by the end of the period the top 20% of businesses will account for just over 80% of the total net GVA impact while 40% of the impact will come from the top 5% of businesses. These proportions were significantly higher between 2004 and 2007, as a high proportion of the businesses were still pre-trading during this period.



Proportion of Net GVA impact attributable to best performing businesses Figure A2.3

Impact by sector and business type (2021)

Table A2.10 provides a breakdown of the anticipated net additional GVA impact in 2021 by sector and business type. It shows that life science businesses and spin outs may have an impact on GVA that is disproportionate to their size; this is not the case for enabling technology businesses.³¹

The Wave 2 New business sample is expected to generate an impact that is disproportionate to its share of the survey sample.

Impacts by sector and business type			Table	A2.10
Sector or type	Impact £m	% of impact	Number of companies	% of companies
			Interviewed	Interviewed
Wave 2 Longitudinal sample	37.2	56%	52	63%
Wave 2 New business sample	29.6	44%	31	37%
Top 5 businesses	30.7	46%	5	6%
Enabling technology	29.3	44%	47	57%
Life sciences	29.9	45%	28	34%
Spin out businesses	31.5	47%	31	37%
Non spin out businesses	35.3	53%	52	63%
Spin outs in the life science sector	23.3	35%	13	16%
Enabling technology spin outs	4.2	6%	15	18%

Figure A2.4 below shows net GVA impact in each calendar year between 2004 and 2021 by sample. It shows that, from 2015 onwards, the (mid-point estimate) proportion of impact attributable to businesses in the Wave 2 New business sample will exceed that sample's 37% share of the survey sample.

³¹ when making absolute comparisons the margins of error discussion, as set out earlier, should be borne in mind



Figure A2.5 below provides a similar split by business type over time. It shows that, although spin out businesses only account for 37% of the business base in each year, they are expected to account for over 40% of total impact from 2016 onwards.







Figure A2.6 shows that from 2008 onwards the net GVA impact share attributable to the life science sector is expected to grow considerably, while the proportion attributable to the enabling technologies sector is expected to decline. This is largely due to the very high levels of growth expected by two Life Science companies over this period.



Employment impact and cost per net job

This section presents net employment impact figures.³²

Wave 2 Longitudinal businesses

For Wave 2 Longitudinal businesses the net employment impact was estimated at 97 jobs in 2004/5 (year 1), anticipated to rise to 1,334 by 2013/14 (year 10). The corresponding discounted cost per net job is estimated to be $\pounds77.2k$ over 10 years³³.

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Net Employment impacts and cost per net job: Wave 2 Longitudinal sample

			Tuble A	2.11
	Year 1 2004/5	Year 3 2006	Year 5 2008	Year 10 2013
Total employment impact	97	799	2,377	1,334
Cumulative costs (£m)	7.4	47.0	97.7	113.2
Cumulative costs (£m, PV)	7.4	45.0	90.2	103.0
Cumulative cost per job (£k, PV)	76.2	56.3	37.9	77.2

Wave 2 New businesses

Although the Wave 2 New business sample is smaller, its businesses had a higher estimated aggregate employment impact in programme years 1 and 3. The net employment impact was estimated at 367 jobs in 2008/9 and anticipated to rise to 722 by 2017/18. The corresponding discounted cost per net job is estimated to be \pounds 51.2k over 10 years.

³² These relate to the total number of headcount employee jobs in the particular year. Unlike the 'job year' measure, jobs have not been aggregated across programme years. Depending upon the survey respondent's interpretation of the question, it may not include unpaid work by project directors, nor will it normally include labour procured on a consultancy or free-lance basis. The figures also treat both part time workers (who accounted for 21% of the sample in 2010) and full time workers as a single job, meaning that the figures quoted are likely to be lower than those under the full time equivalent job measure.

³³ In both samples, the cost per job generally fell in the years up to 2011, as the level of SE investment declined and the businesses recorded employment growth. Beyond 2011, the figures fluctuated upwards and downwards dependent upon changes to the value of gross employment, optimism bias, and deadweight, with a big increase in deadweight observed in 2011.

ymeni impacis ana cosi pei job. W	inpucis una così per job. Mave z New su		Tuble A	L. I Z	
	Year 1 2008/9	Year 3 2010/11	Year 5 2012/13	Year 10 2017/18	
Total employment impact	367	707	596	722	
Cumulative costs (£m)	32.1	37.1	37.2	37.2	
Cumulative costs (£m, PV)	32.1	36.8	37.0	37.0	
Cumulative cost per job (£k, PV)	87.5	52.1	62.1	51.2	

Employment impacts and cost per job: Wave 2 New sample Table A2.12

Turnover impact

In addition to the above assessments of GVA and employment evidence of turnover impact is also presented for completeness, as set out in Appendix 5.

Wider impacts

Alongside economic impact, it is recognised that there are a number of wider benefits to the economy resulting from the activity supported in this space. These include improvements to productivity, expenditure on research and development and access to overseas markets; all contributors to Scottish Government targets and areas recognised to be fundamental for creating a strong, sustainable growth economy. Other benefits include use of intellectual property mechanisms and skills improvements.

Productivity

Assuming that each of the supported businesses will operate at a level of productivity which is consistent with all other businesses in their sector, GVA per head productivity impact is estimated at £87.9k per head for the Wave 2 Longitudinal sample and £91.9k for the Wave 2 New sample (based on headcount employment). Both of these figures are significantly higher than Scotland's average GVA per employee of c£50k per annum³⁴, suggesting that the programme will make a positive contribution towards the Government Economic Strategy target to "rank in the top quartile for productivity against our key trading partners in the OECD by 2017". Note: this calculation uses the head-count measure in consideration of numbers of jobs and will therefore underestimate productivity levels where part-time employment exists.

Exports

37% of Wave 2 Longitudinal businesses said that the support had allowed them to access new export markets while 31% of the Wave 2 New businesses stated this. Similarly, 37% of Wave 2 Longitudinal and 5% of Wave 2 New businesses said that the programme had helped them to improve export sales.

Impact on exports	exports Table A2.13			
	Wave 2 Longitudinal	Wave 2 New	Combined	
% accessing new export markets	37%	31%	35%	
% reporting improved export sales	37%	5%	25%	

Figure A2.7 below shows the proportion of turnover from exports estimated by the companies in both samples³⁵. These show strong projected growth in the export content of turnover in the future, with the Wave 2 New sample projecting growth from 21% to 60%, 2010/11-16/17, and the Wave 2 Longitudinal sample projecting growth from 42% to 70%.

³⁴ Based on the last published figures for this measure (£45,741 in 2007) inflated to 2011 prices. See <u>http://www.scotland.gov.uk/Resource/Doc/933/0085474.xls</u>

³⁵ for caution, where companies could not or did not provide exporting data, export sale proportions were assumed to be zero

The share of net additional GVA impact attributable to exports was estimated for both cohorts by applying company data on export sale proportions³⁶ to net additional GVA impacts on a company by company basis and then grossing up to the population. Net additional GVA impact from exports is estimated in 2010/11 to be £59m across all SE supported companies, £54.9m from the Wave 1 companies and £4.1m from the Wave 2 New companies. This estimated to grow to £288.3m in 2017/18.



Business Expenditure in Research & Development (BERD)

The nature of business activity ensures a significant contribution to levels of Business Expenditure in Research & Development - although it is not possible to determine actual expenditure figures.

Time additionality

Ensuring that a product/service offering hits the market at the right time is a critical success factor, especially for technology based businesses. Importantly, 65% of Wave 2 Longitudinal businesses and 39% of Wave 2 New businesses reported that SE support helped them to generate sales sooner than they would have done otherwise, in 27% of cases on average by over two years.

Time additionality - Turnover			Table A2.14
	Wave 2 Longitudinal	Wave 2 New	Combined
Brought forward 1 year	15%	13%	14%
Brought forward 1-2 years	15%	13%	14%
Brought forward more than 2 years	35%	13%	27%
No difference	35%	61%	45%
Delayed	0%	0%	0%

Similarly, 71% of Wave 2 Longitudinal businesses and 37% of Wave 2 New businesses stated that SE support helped them to employ a member of staff sooner than would otherwise have been possible.

³⁶ again, for caution, 0% export sale proportions were assumed where the company data did not exist

Time additionality - Employment

Table A2.15

	Wave 2 Longitudinal	Wave 2 New	Combined
Brought forward 1 year	12%	19%	15%
Brought forward 1-2 years	12%	9%	11%
Brought forward more than 2 years	37%	9%	26%
No difference	39%	63%	48%
Delayed	0%	0%	0%

Intellectual property protection

Considering the competitive advantage positions gained through intellectual property protection, 80% of the Wave 2 Longitudinal businesses and 63% of Wave 2 New businesses reported that the programme had helped them to protect their intellectual property. This included:

- 63% of Wave 2 Longitudinal businesses and 50% of Wave 2 New businesses who had secured a registered company name through their participation in the programme
- 63% of Wave 2 Longitudinal businesses and 50% of Wave 2 New businesses who had registered a domain name, and
- 62% of Wave 2 Longitudinal businesses and 16% of Wave 2 New businesses who had secured a copyright on their works

Other benefits

Other benefits associated with the programme included:

- **improved skills** 71% of the Wave 2 Longitudinal sample and 77% of the Wave 2 New business sample cited this as a benefit
- increased value of company 60% of the Wave 2 Longitudinal sample and 45% of the Wave 2 New business sample cited this as a benefit
- **increased sales** 58% of the Wave 2 Longitudinal sample and 50% of the Wave 2 New business sample cited this as a benefit
- quality 60% of the Wave 2 Longitudinal sample and 50% of the Wave 2 New business sample stated that SE support has made the quality of staff better, while 23% of the Wave 2 Longitudinal sample and 9% of the Wave 2 New business sample stated that SE had helped improve their quality standards

Sensitivity tests

Four sensitivity tests were run for each sample to assess the robustness of the levels of impact calculated (as set out above). This is achieved by altering the environment under which the impacts would be generated to test whether a positive return on investment is still likely given these corresponding changes in scenario. The following parameters were tested:

• Sensitivity 1: continuing support requirements – the baseline impact estimation is based on the assumption that businesses in both samples will not receive any further support from SE in the remaining programme years. While this is unlikely to be completely the case, there is evidence that future expenditure levels will be low, given that SE expenditure on Wave 2 Longitudinal businesses in 2010/11 was £528k, a marginal sum (0.35%) when set against the £150.4 million invested across the seven preceding years. A sensitivity test has been run to examine how the return on investment would change if the level of investment provided in 2010/11 were repeated in each of the remaining programme years

- Sensitivity 2: multipliers removed the baseline impact estimation is based on the assumption that other businesses in the Scottish economy will benefit indirectly from the programme either as a result of purchases made in supported company supply chains, or by those made by the company staff. This sensitivity test examines what would happen if this were not the case
- Sensitivity 3: increased deadweight the deadweight assumptions in the baseline were based on the information provided by the company. This sensitivity test examines what the impact would be if respondents overstated the proportion of their impacts attributable to SE. It is based on a 10% increase in the deadweight levels of each company citing an attributable impact
- Sensitivity 4: combined sensitivity this sensitivity examines the impact that would occur in the highly cautious scenario, in which the 2010 costs were repeated in all future years, the multipliers were removed, and the deadweight levels were increased

Wave 2 Longitudinal businesses

The impact of these sensitivities on the Wave 2 Longitudinal sample is as follows:

Sensitivity tests – Wave 2 Longitud	inal sample		lable A	2.16
	Year 1 2004/5	Year 3 2006/7	Year 5 2008/9	Year 10 2013/14
Impact ratios				
Baseline	£1.75	£1.82	£2.69	£6.13
Sensitivity 1	£1.75	£1.82	£2.69	£5.24
Sensitivity 2	£1.18	£1.17	£1.70	£3.89
Sensitivity 3	£0.07	£0.20	£1.32	£4.04
Sensitivity 4	£0.05	£0.12	£0.81	£2.49
Cost per job (£k)				
Baseline	£76.2	£58.8	£41.1	£84.8
Sensitivity 1	£76.2	£58.8	£41.1	£102.0
Sensitivity 2	£127.5	£103.6	£66.3	£138.3
Sensitivity 3	£151.5	£128.5	£51.6	£100.8
Sensitivity 4	£247.9	£226.8	£81.8	£163.7

Table A2.16 shows that:

- the extrapolation of 2010/11 costs will have only a minor impact on the impact: cost ratio and cost per job in year 13, as the costs in 2010/11 are low in comparison to those incurred in earlier years
- the removal of the multiplier, therefore citing impacts at the beneficiary level alone and not across the wider economy through supply chain and wage effects, will have a greater impact, particularly in the later years, where businesses tend to perform more strongly and impacts tend to be greater
- the changes to the deadweight factors will also have a substantial effect on the bottom line impact, particularly in the earlier years of the programme when attribution to SE tends to be higher
- however, even when all three of these impacts are combined, the programme will return a positive impact ratio over the 10 year evaluation period

Wave 2 New businesses

The impact of these sensitivities on the Wave 2 New sample is as follows:

Sensitivity tests – Wave 2 New san	nple		Table A	2.17
	Year 1 2008	Year 3 2010	Year 5 2012	Year 10 2017
Impact ratios				
Baseline	£0.03	£0.25	£1.76	£8.23
Sensitivity 1	£0.03	£0.25	£1.58	£5.91
Sensitivity 2	£0.02	£0.15	£1.07	£5.02
Sensitivity 3	£0.02	£0.17	£1.02	£5.52
Sensitivity 4	£0.01	£0.11	£0.64	£3.45
Cost per job (£k)				
Baseline	£87.4	£52.4	£62.4	£51.5
Sensitivity 1	£87.4	£52.4	£70.8	£76.1
Sensitivity 2	£184.5	£96.0	£97.3	£75.8
Sensitivity 3	£90.7	£54.7	£66.4	£58.3
Sensitivity 4	£194.1	£101.2	£103.8	£87.1

These sensitivities follow a similar pattern to those in the Wave 2 Longitudinal sample, with the continued cost sensitivity again having the least substantial impact and the multiplier sensitivity again having the greatest impact over the ten year period. As in the case of the longitudinal sample, even in the combined zero multiplier, increased deadweight and continued costs scenario, the programme will generate a positive return on investment by year 10.

Appendix 3

Finance Overview Tables

This Appendix has been omitted due to commercial sensitivities.

Appendix 4

Stage length overviews

Stage length overviews

All figures relate to the number of months

Sample		Proving the Concept								
	Max	Min	Median	Mean	Count					
Wave 1 - 2008	30	3	15	15	84					
Wave 2 - Longitudinal 2008	30	3	9	14	46					
Wave 2 - Longitudinal 2011	30	3	9	14	46					
Wave2-New	30	3	15	17	27					

Sample		Early Stage Technology Development								
	Max	Min	Median	Mean	Count					
Wave 1 - 2008	30	3	9	14	75					
Wave 2 - Longitudinal 2008	30	3	9	12	40					
Wave 2 - Longitudinal 2011	30	3	9	13	43					
Wave 2 - New	30	3	9	15	21					

Sample		Product Development								
	Max	Min	Median	Mean	Count					
Wave 1 - 2008	42	3	12	15	60					
Wave 2 - Longitudinal 2008	30	3	9	13	34					
Wave 2 - Longitudinal 2011	42	3	9	15	39					
Wave 2 - New	42	3	9	13	18					

Sample		Production/Marketing									
	Max	Min	Median	Mean	Count						
Wave 1 - 2008	66	3	9	14	43						
Wave 2 - Longitudinal 2008	30	3	9	12	23						
Wave 2 - Longitudinal 2011	30	3	9	14	32						
Wave 2 - New	30	3	15	15	10						

Appendix 5

Impact tables

GVA impact longitudinal

NPV @ 3.5% p.a.			_							
EVALUATION DATE		Oct-11				_				
	Commercialisation I	Programme								
YEAR										
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A. Total Costs (Annual)	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16.678.867	£7.316.416	£7.778.199	£397.475	£0	f0
B. Total Costs (Cumulative)	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004	£113,172,004
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£124,095,393	£92,543,806	£134,086,307	£80,687,089	£107,639,998	£109,792,246
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
G. Total Benefits (Annual, post adjust adjust)	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£124,095,393	£92,543,806	£134,086,307	£80,687,089	£96,371,899	£88,008,606
H. Total Benefits (Cumulative)	£12,979,255	£46,618,643	£85,701,234	£143,862,551	£267,957,944	£360,501,750	£494,588,057	£575,275,146	£671,647,045	£759,655,651
NET UNDISCOUNTED COST	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0	£0
NET UNDISCOUNTED BENEFITS	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£124,095,393	£92,543,806	£134,086,307	£80,687,089	£96,371,899	£88,008,606
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337
NET PRESENT COST* (Annual)	£7,402,595	£17,312,128	£20,255,633	£30,649,870	£14,534,669	£6,160,226	£6,327,570	£312,412	£0	£0
NET PRESENT COST* (Cumulative)	£7,402,595	£24,714,723	£44,970,356	£75,620,227	£90,154,895	£96,315,121	£102,642,691	£102,955,103	£102,955,103	£102,955,103
NET PRESENT BENEFITS* (Annual)	£12,979,255	£32,501,825	£36,484,017	£52,458,176	£108,141,966	£77,919,402	£109,079,297	£63,419,323	£73,185,934	£64,574,640
NET PRESENT BENEFITS* (Cumulative)	£12,979,255	£45,481,079	£81,965,096	£134,423,272	£242,565,237	£320,484,639	£429,563,936	£492,983,258	£566,169,192	£630,743,832
TOTAL NET PRESENT COST* =	£102,955,103									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Costs	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004	£113,172,004
Costs (Discounted)	£7,402,595	£24,714,723	£44,970,356	£75,620,227	£90,154,895	£96,315,121	£102,642,691	£102,955,103	£102,955,103	£102,955,103
Benefits	£12,979,255	£46,618,643	£85,701,234	£143,862,551	£267,957,944	£360,501,750	£494,588,057	£575,275,146	£671,647,045	£759,655,651
Benefits (Discounted)	£12,979,255	£45,481,079	£81,965,096	£134,423,272	£242,565,237	£320,484,639	£429,563,936	£492,983,258	£566,169,192	£630,743,832
Impact Ratio	1.75	1.84	1.82	1.78	2.69	3.33	4.19	4.79	5.50	6.13

GVA impact longitudinal (cont)

	NPV	@	3	.5%	p.
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NPV @ 3.5% p.a.									
EVALUATION DATE:									
YEAR :									TOTAL
		0045		00.17		0040			
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	0110 170 001
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
B. Total Costs (Cumulative)	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	£167,121,483	£162,045,315	£219,435,118	£219,170,972	£218,906,827	£218,642,681	£218,378,535	£208,223,001	£2,424,631,322
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	£119,939,570	£104,122,221	£126,237,915	£112,886,875	£100,947,707	£90,271,120	£80,723,609	£68,912,191	
H. Total Benefits (Cumulative)	£879,595,221	£983,717,442	£1,109,955,357	£1,222,842,232	£1,323,789,938	£1,414,061,058	£1,494,784,668	£1,563,696,859	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
NET UNDISCOUNTED BENEFITS	£119,939,570	£104,122,221	£126,237,915	£112,886,875	£100,947,707	£90,271,120	£80,723,609	£68,912,191	
DISCOUNT FACTOR @ 3.5% p.a.	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£102,955,103
NET PRESENT COST* (Cumulative)	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	
NET PRESENT BENEFITS* (Annual)	£85,027,418	£71,318,069	£83,542,144	£72,180,337	£62,363,655	£53,881,985	£46,553,783	£38,398,133	£1,144,009,355
NET PRESENT BENEFITS* (Cumulative)	£715,771,250	£787,089,319	£870,631,463	£942,811,799	£1,005,175,454	£1,059,057,439	£1,105,611,222	£1,144,009,355	
TOTAL NET PRESENT COST* =									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	
Costs	£113.172.004	£113.172.004	£113.172.004	£113.172.004	£113,172,004	£113.172.004	£113.172.004	£113.172.004	
Costs (Discounted)	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	
Benefits	£879,595,221	£983,717,442	£1,109,955,357	£1,222,842,232	£1.323,789,938	£1,414,061,058	£1,494,784,668	£1.563.696.859	
Benefits (Discounted)	£715.771.250	£787.089.319	£870.631.463	£942.811.799	£1.005.175.454	£1.059.057.439	£1,105,611,222	£1,144,009,355	
Impact Ratio	6.95	7.64	8.46	9.16	9.76	10.29	10.74	11.11	

GVA impact new

NPV @ 3.5% p.a. EVALUATION DATE: Oct-11 EVALUATION TITLE: Commercialisation Programme YEAR : Total costs (undiscounted) 2004 2005 2006 2007 2008 2009 2010 2011 2012 A. Total Costs (Annual) £2,432,38 £5,887,62 £7,129,77 £11,166.02 £5,480,44 £2,404.07 £2,555.80 £130,60 £ B. Total Costs (Cumulative) £2.432.38 £8.320.00 £15,449,78 £26,615,80 £32.096.24 £34,500,32 £37.056.127 £37,186,73 £37,186,732 **BENEFITS** (undiscounted): G. Total Benefits (Annual, pre adjust) £1.083.5 £2 656 49 £6.034.7 £25,799.4 £41.758.31 Failure adjustment 09 0% 0 00 Acquisition adjustment Adjustment factor (year) 1.0 1.00 1.00 1.11 10 10 1.00 1.00 1.0 Adjustment factor (cumulative) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.117 G. Total Benefits (Annual, post adjust adjust) £ f £ £1,083,50 £2,656,49 £6,034,78 £25,799,43 £37,386,92 H. Total Benefits (Cumulative) £1.0 £9.774.7 £35.574.3 £72.961.14 NET UNDISCOUNTED COST £2.43 £11.16 NET UNDISCOUNTED BENEFITS £25,799.4 F6 034 7 £37 386 9 £1.0 DISCOUNT FACTOR @ 3.5% p.a. 1.000 0.901 0.8714 1.00 1.00 1 000 1.000 0.96 0.93 NET PRESENT COST* (Annual) £2,432,3 £5.887.62 £7,129,77 £11,166, £5,480,44 £2,322,7 £117,7 £2,385,8 NET PRESENT COST* (Cumulative) £8,320,0 £15,449,78 £34,419, £2,432 £26.615. £32,096,2 £36,804,8 £36,922,6 £36,922,69 NET PRESENT BENEFITS* (Annual) NET PRESENT BENEFITS* (Cumulative) £1 (£3.6 FQ 2 £32.5F TOTAL NET PRESENT COST* = £36.922.69 * A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost Appraisal and Evaluation combined Year 1 Year 3 Year 4 Year 5 Year 2 Costs £2.432.389 £8.320.009 £15,449,780 £26,615,807 £32.096.248 £34,500,320 £37.056.127 £37.186.732 £37.186.732 Costs (Discounted) £2,432,389 £8,320,009 £15,449,780 £26,615,807 £32,096,248 £34,419,023 £36,804,896 £36,922,694 £36,922,694 Benefits £72,961,142 £0 £0 £0 £0 £1,083,506 £3,739,997 £9,774,784 £35,574,216 Benefits (Discounted) £0 £0 £0 £0 £1,083,506 £3,650,164 £9,283,702 £32,553,312 £65,133,857 Impact Ratio 0.00 0.00 0.00 0.00 0.03 0.11 0.25 0.88 1.76

GVA impact new (cont)

NPV @ 3.5% p.a.								
EVALUATION DATE:								
EVALUATION TITLE:								
YEAR :								
Tatal agets (undiagounted)	2014	2015	2016	2017	2019	2010	2020	2021
A Total Costs (Annual)	2014	2013	2010	2017	2018	2019	2020	2021
R. Total Costs (Annual) B. Total Costs (Cumulative)	£37 186 732	£37 186 732	£37 186 732	£37 186 732	£37 186 732	£37 186 732	£37 186 732	£37 186 732
	201,100,102	201,100,102	201,100,102	201,100,102	201,100,102	201,100,102	201,100,102	201,100,102
BENEFITS (undiscounted):								
G. Total Benefits (Annual, pre adjust)	£87,431,609	£78,838,055	£148,104,643	£148,104,643	£148,104,643	£148,104,643	£148,104,643	£147,465,756
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022
G. Total Benefits (Annual, post adjust adjust)	£62,747,825	£50,657,394	£85,202,503	£76,283,233	£68,297,660	£61,148,043	£54,746,870	£48,804,351
H. Total Benefits (Cumulative)	£168,001,453	£218,658,847	£303,861,350	£380,144,583	£448,442,243	£509,590,285	£564,337,155	£613,141,506
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0
NET UNDISCOUNTED BENEFITS	£62,747,825	£50,657,394	£85,202,503	£76,283,233	£68,297,660	£61,148,043	£54,746,870	£48,804,351
DISCOUNT FACTOR @ 3.5% p.a.	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0
NET PRESENT COST* (Cumulative)	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694
NET PRESENT BENEFITS* (Annual)	£51,045,396	£39,816,254	£64,703,765	£55,971,370	£48,417,496	£41,883,090	£36,230,564	£31,205,705
NET PRESENT BENEFITS* (Cumulative)	£143,368,661	£183,184,914	£247,888,680	£303,860,050	£352,277,546	£394,160,636	£430,391,200	£461,596,905
TOTAL NET PRESENT COST* =								
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.								
Appraisal and Evaluation combined	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Costs	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732
Costs (Discounted)	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694
Benefits	£168,001,453	£218,658,847	£303,861,350	£380,144,583	£448,442,243	£509,590,285	£564,337,155	£613,141,506
Benefits (Discounted)	£143,368,661	£183,184,914	£247,888,680	£303,860,050	£352,277,546	£394,160,636	£430,391,200	£461,596,905
Impact Ratio	3.88	4.96	6.71	8.23	9.54	10.68	11.66	12.50

GVA impact combined sample

NPV @ 3.5% n.a										
EVALUATION DATE		Oct-11	1							
	Commercialisation F	Programme				1				
YEAR	: Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Tetel and the Parameter D	0004	0005	0000	0007	0000		0010	0014	0010	0010
1 otal costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A. Total Costs (Annual)	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
B. Total Costs (Cumulative)	£9,834,984	£33,640,657	102,408,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£125,178,899	£95,200,297	£140,121,094	£106,486,521	£149,398,318	£150,077,677
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
G. Total Benefits (Annual, post adjust adjust)	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£125,178,899	£95,200,297	£140,121,094	£106,486,521	£133,758,824	£120,301,092
H. Total Benefits (Cumulative)	£12,979,255	£46,618,643	£85,701,234	£143,862,551	£269,041,450	£364,241,747	£504,362,841	£610,849,362	£744,608,187	£864,909,279
NET UNDISCOUNTED COST	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
NET UNDISCOUNTED BENEFITS	£12,979,255	£33,639,388	£39,082,591	£58,161,317	£125,178,899	£95,200,297	£140,121,094	£106,486,521	£133,758,824	£120,301,092
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337
NET PRESENT COST* (Annual)	£9,834,984	£23,000,651	£26,911,350	£40,720,987	£19,310,557	£8,184,389	£8,406,720	£415,066	£0	£0
NET PRESENT COST* (Cumulative)	£9,834,984	£32,835,634	£59,746,984	£100,467,971	£119,778,528	£127,962,918	£136,369,638	£136,784,704	£136,784,704	£136,784,704
NET PRESENT BENEFITS* (Annual)	£12,979,255	£32,501,825	£36,484,017	£52,458,176	£109,086,178	£80,156,096	£113,988,600	£83,697,443	£101,577,997	£88,268,637
NET PRESENT BENEFITS* (Cumulative)	£12,979,255	£45,481,079	£81,965,096	£134,423,272	£243,509,450	£323,665,546	£437,654,146	£521,351,589	£622,929,586	£711,198,223
TOTAL NET PRESENT COST* =	£136,784,704									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined										
Costs	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
Costs (Discounted)	£9,834,984	£32,835,634	£59,746,984	£100,467,971	£119,778,528	£127,962,918	£136,369,638	£136,784,704	£136,784,704	£136,784,704
Benefits	£12,979,255	£46,618,643	£85,701,234	£143,862,551	£269,041,450	£364,241,747	£504,362,841	£610,849,362	£744,608,187	£864,909,279
Benefits (Discounted)	£12,979,255	£45,481,079	£81,965,096	£134,423,272	£243,509,450	£323,665,546	£437,654,146	£521,351,589	£622,929,586	£711,198,223
Impact Ratio	1.32	1.39	1.37	1.34	2.03	2.53	3.21	3.81	4.55	5.20

GVA impact combined sample (continued)

			NID) (

NPV @ 3.5% p.a. EVALUATION DATE:									
YEAR :	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	TOTAL
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
B. Total Costs (Cumulative)	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	£254,553,092	£240,883,370	£367,539,761	£367,275,615	£367,011,469	£366,747,324	£366,483,178	£355,688,756	£3,596,507,922
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	£182,687,396	£154,779,615	£211,440,418	£189,170,107	£169,245,367	£151,419,163	£135,470,480	£117,716,542	
H. Total Benefits (Cumulative)	£1,047,596,674	£1,202,376,289	£1,413,816,707	£1,602,986,814	£1,772,232,181	£1,923,651,344	£2,059,121,823	£2,176,838,365	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
NET UNDISCOUNTED BENEFITS	£182,687,396	£154,779,615	£211,440,418	£189,170,107	£169,245,367	£151,419,163	£135,470,480	£117,716,542	
DISCOUNT FACTOR @ 3.5% p.a.	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£136,784,704
NET PRESENT_COST* (Cumulative)	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	
NET PRESENT BENEFITS* (Annual)	£129,510,532	£106,015,634	£139,927,737	£120,956,152	£104,556,706	£90,380,678	£78,126,626	£65,592,102	£1,546,264,390
NET PRESENT BENEFITS* (Cumulative)	£840,708,755	£946,724,389	£1,086,652,126	£1,207,608,278	£1,312,164,984	£1,402,545,662	£1,480,672,288	£1,546,264,390	
TOTAL NET PRESENT COST* =									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined									
Costs	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
Costs (Discounted)	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	
Benefits	£1,047,596,674	£1,202,376,289	£1,413,816,707	£1,602,986,814	£1,772,232,181	£1,923,651,344	£2,059,121,823	£2,176,838,365	
Benefits (Discounted)	£840,708,755	£946,724,389	£1,086,652,126	£1,207,608,278	£1,312,164,984	£1,402,545,662	£1,480,672,288	£1,546,264,390	
Impact Ratio	6.15	6.92	7.94	8.83	9.59	10.25	10.82	11.30	

Turnover impact longitudinal sample

NPV @ 3.5% p.a.									
EVALUATION DATE:		Oct-11							
	Commercialisation F	rogramme							
YEAR :									
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012
A. Total Costs (Annual)	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0
B. Total Costs (Cumulative)	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£166,516,126	£140,624,703	£180,173,494	£144,043,261	£191,871,120
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117
G. Total Benefits (Annual, post adjust adjust)	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£166,516,126	£140,624,703	£180,173,494	£144,043,261	£171,785,438
H. Total Benefits (Cumulative)	£18,360,408	£62,223,288	£113,743,654	£185,267,614	£351,783,740	£492,408,443	£672,581,937	£816,625,197	£988,410,635
NET UNDISCOUNTED COST	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0
NET UNDISCOUNTED BENEFITS	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£166,516,126	£140,624,703	£180,173,494	£144,043,261	£171,785,438
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594
NET PRESENT COST* (Annual)	£7,402,595	£17,312,128	£20,255,633	£30,649,870	£14,534,669	£6,160,226	£6,327,570	£312,412	£0
NET PRESENT COST* (Cumulative)	£7,402,595	£24,714,723	£44,970,356	£75,620,227	£90,154,895	£96,315,121	£102,642,691	£102,955,103	£102,955,103
NET PRESENT BENEFITS* (Annual)	£18,360,408	£42,379,594	£48,094,812	£64,510,515	£145,109,184	£118,402,226	£146,571,253	£113,216,701	£130,455,846
NET PRESENT BENEFITS* (Cumulative)	£18,360,408	£60,740,002	£108,834,815	£173,345,329	£318,454,513	£436,856,739	£583,427,993	£696,644,693	£827,100,540
TOTAL NET PRESENT COST* =	£102,955,103								
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Costs	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004
Costs (Discounted)	£7,402,595	£24,714,723	£44,970,356	£75,620,227	£90,154,895	£96,315,121	£102,642,691	£102,955,103	£102,955,103
Benefits	£18,360,408	£62,223,288	£113,743,654	£185,267,614	£351,783,740	£492,408,443	£672,581,937	£816,625,197	£988,410,635
Benefits (Discounted)	£18,360,408	£60,740,002	£108,834,815	£173,345,329	£318,454,513	£436,856,739	£583,427,993	£696,644,693	£827,100,540
Impact Ratio	2.48	2.46	2.42	2.29	3.53	4.54	5.68	6.77	8.03

Turnover impact longitudinal (cont)

NPV @ 3.5% p.a.										
EVALUATION DATE:										
YEAR :										TOTAL
			0045		0047					
<u>1 otal costs (undiscounted)</u>	2013	2014	2015	2016	2017	2018	2019	2020	2021	0440 470 004
A. Total Costs (Annual)	£0	£0	£0	£0	£U	£0	£U	£0	£0	£113,172,004
	2113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	2113,172,004	1113,172,004	2113,172,004	
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	£176,294,438	£254,710,528	£248,450,388	£333,366,392	£333,008,901	£332,651,411	£332,293,920	£331,936,430	£316,577,777	£3,667,786,500
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.248	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	£141,316,243	£182,800,384	£159,641,803	£191,780,962	£171,520,588	£153,400,410	£137,194,368	£122,700,277	£104,772,615	
H. Total Benefits (Cumulative)	£1,129,726,877	£1,312,527,261	£1,472,169,064	£1,663,950,026	£1,835,470,614	£1,988,871,025	£2,126,065,393	£2,248,765,669	£2,353,538,285	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
NET UNDISCOUNTED BENEFITS	£141,316,243	£182,800,384	£159,641,803	£191,780,962	£171,520,588	£153,400,410	£137,194,368	£122,700,277	£104,772,615	
DISCOUNT FACTOR @ 3.5% p.a.	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£0	£102,955,103
NET PRESENT COST* (Cumulative)	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	
NET PRESENT BENEFITS* (Annual)	£103,688,104	£129,590,631	£109,345,968	£126,917,438	£109,670,977	£94,767,980	£81,890,031	£70,761,975	£58,379,697	£1,712,113,341
NET PRESENT BENEFITS* (Cumulative)	£930,788,644	£1,060,379,275	£1,169,725,243	£1,296,642,681	£1,406,313,658	£1,501,081,638	£1,582,971,669	£1,653,733,644	£1,712,113,341	
TOTAL NET PRESENT COST* =										
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	
Costs	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
Costs (Discounted)	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	£102,955,103	
Benefits	£1,129,726,877	£1,312,527,261	£1,472,169,064	£1,663,950,026	£1,835,470,614	£1,988,871,025	£2,126,065,393	£2,248,765,669	£2,353,538,285	
Benefits (Discounted)	£930,788,644	£1,060,379,275	£1,169,725,243	£1,296,642,681	£1,406,313,658	£1,501,081,638	£1,582,971,669	£1,653,733,644	£1,712,113,341	
Impact Ratio	9.04	10.30	11.36	12.59	13.66	14.58	15.38	16.06	16.63	

Turnover impact new

NPV @ 3.5% p.a.									
EVALUATION DATE:		Oct-11							
EVALUATION TITLE:	Commercialisation F	rogramme				1			
YEAR :	:								
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012
A. Total Costs (Annual)	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,404,071	£2,555,807	£130,605	£0
B. Total Costs (Cumulative)	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	£0	£0	£0	£0	£1,123,033	£2,777,444	£12,505,830	£64,059,663	£87,475,735
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117
G. Total Benefits (Annual, post adjust adjust)	£0	£0	£0	£0	£1,123,033	£2,777,444	£12,505,830	£64,059,663	£78,318,495
H. Total Benefits (Cumulative)	£0	£0	£0	£0	£1,123,033	£3,900,477	£16,406,307	£80,465,970	£158,784,466
NET UNDISCOUNTED COST	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,404,071	£2,555,807	£130,605	£0
NET UNDISCOUNTED BENEFITS	£0	£0	£0	£0	£1,123,033	£2,777,444	£12,505,830	£64,059,663	£78,318,495
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	0.9662	0.9335	0.9019	0.8714
NET PRESENT COST* (Annual)	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,322,774	£2,385,873	£117,798	£0
NET PRESENT COST* (Cumulative)	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,419,023	£36,804,896	£36,922,694	£36,922,694
NET PRESENT BENEFITS* (Annual)	£0	£0	£0	£0	£1,123,033	£2,683,521	£11,674,326	£57,778,146	£68,250,044
NET PRESENT BENEFITS* (Cumulative)	£0	£0	£0	£0	£1,123,033	£3,806,554	£15,480,880	£73,259,026	£141,509,070
TOTAL NET PRESENT COST* =	£36,922,694								
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined					Year 1	Year 2	Year 3	Year 4	Year 5
Costs					£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732
Costs (Discounted)					£32,096,248	£34,419,023	£36,804,896	£36,922,694	£36,922,694
Benefits					£1,123,033	£3,900,477	£16,406,307	£80,465,970	£158,784,466
Benefits (Discounted)					£1,123.033	£3,806.554	£15,480.880	£73,259.026	£141,509.070
Impact Ratio					0.03	0.11	0.42	1.98	3.83

Turnover impact new (cont)

NPV @ 3.5% p.a.										
EVALUATION DATE	:									
EVALUATION TITLE										
YEAR										TOTAL
Tetal and for Parameter N	0010	0014	0045	0010	0047		0040	0000	0004	
I otal costs (undiscounted)	2013	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£C) £0	£0	£0	£0	£37,186,732
B. Total Costs (Cumulative)	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	£88,497,370	£221,372,225	£221,158,549	£422,633,454	£442,046,904	£461,460,354	£480,873,804	£500,287,254	£519,063,069	£3,525,334,690
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.248	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	£70,938,800	£158,874,186	£142,105,431	£243,135,039	£227,682,037	£212,799,962	£198,538,624	£184,931,146	£171,785,890	
H. Total Benefits (Cumulative)	£229,723,266	£388,597,451	£530,702,882	£773,837,921	£1,001,519,959	£1,214,319,921	£1,412,858,545	£1,597,789,691	£1,769,575,581	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0) £0	£0	£0	£0	£37,186,732
NET UNDISCOUNTED BENEFITS	£70,938,800	£158,874,186	£142,105,431	£243,135,039	£227,682,037	£212,799,962	£198,538,624	£184,931,146	£171,785,890	
DISCOUNT FACTOR @ 3.5% p.a.	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£C) £0	£0	£0	£0	£36,922,694
NET PRESENT COST* (Cumulative)	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	
NET PRESENT BENEFITS* (Annual)	£59,728,566	£129,244,252	£111,693,584	£184,639,558	£167,057,363	£150,857,897	£135,988,179	£122,384,344	£109,840,612	£1,312,943,426
NET PRESENT BENEFITS* (Cumulative)	£201,237,636	£330,481,888	£442,175,473	£626,815,031	£793,872,394	£944,730,291	£1,080,718,470	£1,203,102,814	£1,312,943,426	
TOTAL NET PRESENT COST* =										
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	
Costs	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
Costs (Discounted)	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	£36,922,694	
Benefits	£229,723,266	£388,597,451	£530,702,882	£773,837,921	£1,001,519,959	£1,214,319,921	£1,412,858,545	£1,597,789,691	£1,769,575,581	
Benefits (Discounted)	£201,237,636	£330,481,888	£442,175,473	£626,815,031	£793,872,394	£944,730,291	£1,080,718,470	£1,203,102,814	£1,312,943,426	
Impact Ratio	5.45	8.95	11.98	16.98	21.50	25.59	29.27	32.58	35.56	

Turnover impact combined sample

NPV @ 3.5% p.a.										
EVALUATION DATE:		Oct-11								
	Commercialisation F	Programme]				
YEAR :	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A. Total Costs (Annual)	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
B. Total Costs (Cumulative)	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£167,639,159	£143,402,147	£192,850,819	£209,723,748	£284,109,645	£269,554,599
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
G. Total Benefits (Annual, post adjust adjust)	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£167,639,159	£143,402,147	£192,850,819	£209,723,748	£254,368,140	£216,072,858
H. Total Benefits (Cumulative)	£18,360,408	£62,223,288	£113,743,654	£185,267,614	£352,906,773	£496,308,920	£689,159,739	£898,883,486	£1,153,251,626	£1,369,324,485
NET UNDISCOUNTED COST	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
NET UNDISCOUNTED BENEFITS	£18,360,408	£43,862,880	£51,520,365	£71,523,961	£167,639,159	£143,402,147	£192,850,819	£209,723,748	£254,368,140	£216,072,858
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337
NET PRESENT COST* (Annual)	£9,834,984	£23,000,651	£26,911,350	£40,720,987	£19,310,557	£8,184,389	£8,406,720	£415,066	£0	£0
NET PRESENT COST* (Cumulative)	£9,834,984	£32,835,634	£59,746,984	£100,467,971	£119,778,528	£127,962,918	£136,369,638	£136,784,704	£136,784,704	£136,784,704
NET PRESENT BENEFITS* (Annual)	£18,360,408	£42,379,594	£48,094,812	£64,510,515	£146,087,842	£120,740,760	£156,884,265	£164,840,970	£193,170,105	£158,539,348
NET PRESENT BENEFITS* (Cumulative)	£18,360,408	£60,740,002	£108,834,815	£173,345,329	£319,433,171	£440,173,931	£597,058,196	£761,899,166	£955,069,271	£1,113,608,620
TOTAL NET PRESENT COST* =	£136,784,704									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined										
Costs	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
Costs (Discounted)	£9,834,984	£32,835,634	£59,746,984	£100,467,971	£119,778,528	£127,962,918	£136,369,638	£136,784,704	£136,784,704	£136,784,704
Benefits	£18,360,408	£62,223,288	£113,743,654	£185,267,614	£352,906,773	£496,308,920	£689,159,739	£898,883,486	£1,153,251,626	£1,369,324,485
Benefits (Discounted)	£18,360,408	£60,740,002	£108,834,815	£173,345,329	£319,433,171	£440,173,931	£597,058,196	£761,899,166	£955,069,271	£1,113,608,620
Impact Ratio	1.87	1.85	1.82	1.73	2.67	3.44	4.38	5.57	6.98	8.14

Turnover impact combined sample (cont)

NPV @ 3.5% p.a.									
EVALUATION DATE:									
YEAR :	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	TOTAL
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
B. Total Costs (Cumulative)	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	£516,603,349	£510,129,533	£797,394,967	£816,450,926	£835,506,886	£854,562,845	£873,618,805	£877,035,966	£7,533,851,006
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	£370,755,348	£327,783,743	£458,730,028	£420,523,724	£385,289,510	£352,823,817	£322,933,126	£290,258,377	
H. Total Benefits (Cumulative)	£1,740,079,833	£2,067,863,576	£2,526,593,605	£2,947,117,329	£3,332,406,839	£3,685,230,656	£4,008,163,782	£4,298,422,159	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
NET UNDISCOUNTED BENEFITS	£370,755,348	£327,783,743	£458,730,028	£420,523,724	£385,289,510	£352,823,817	£322,933,126	£290,258,377	
DISCOUNT FACTOR @ 3.5% p.a.	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£136,784,704
NET PRESENT COST* (Cumulative)	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	
NET PRESENT BENEFITS* (Annual)	£262,835,442	£224,514,070	£303,579,871	£268,884,616	£238,024,843	£210,597,226	£186,237,443	£161,733,065	£2,970,015,196
NET PRESENT BENEFITS* (Cumulative)	£1,376,444,061	£1,600,958,132	£1,904,538,003	£2,173,422,618	£2,411,447,461	£2,622,044,688	£2,808,282,131	£2,970,015,196	
TOTAL NET PRESENT COST* =									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined									
Costs	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
Costs (Discounted)	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	£136,784,704	
Benefits	£1,740,079,833	£2,067,863,576	£2,526,593,605	£2,947,117,329	£3,332,406,839	£3,685,230,656	£4,008,163,782	£4,298,422,159	
Benefits (Discounted)	£1,376,444,061	£1,600,958,132	£1,904,538,003	£2,173,422,618	£2,411,447,461	£2,622,044,688	£2,808,282,131	£2,970,015,196	
Impact Ratio	10.06	11.70	13.92	15.89	17.63	19.17	20.53	21.71	

Employment impact longitudinal

5% p.a.										
EVALUATION DATE:		Oct-11								
	Commercialisation F	rogramme				1				
YEAR :	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
ts (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
osts (Annual)	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0	£0
costs (Cumulative)	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004	£113,172,004
S (undiscounted):										
enefits (Annual, pre adjust)	97	142	799	1,139	2,377	2,029	3,286	1,480	1,665	1,665
justment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
n adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
nt factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
nt factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
enefits (Annual, post adjust adjust)	97	142	799	1,139	2,377	2,029	3,286	1,480	1,490	1,334
enefits (Cumulative)	97	240	1,039	2,178	4,554	6,583	9,869	11,349	12,839	14,173
ISCOUNTED COST	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0	£0
ISCOUNTED BENEFITS	97	142	799	1,139	2,377	2,029	3,286	1,480	1,490	1,334
T FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
SENT COST* (Annual)	£7,402,595	£17,918,053	£21,698,341	£33,982,059	£16,678,867	£7,316,416	£7,778,199	£397,475	£0	£0
SENT COST [*] (Cumulative)	£7,402,595	£25,320,648	£47,018,988	£81,001,047	£97,679,914	£104,996,330	£112,774,528	£113,172,004	£113,172,004	£113,172,004
SENT BENEFITS* (Annual)	97	142	799	1,139	2,377	2,029	3,286	1,480	1,490	1,334
SENT BENEFITS* (Cumulative)	97	240	1,039	2,178	4,554	6,583	9,869	11,349	12,839	14,173
TOTAL NET PRESENT COST* =	£113,172,004									
sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
l and Evoluation combined										
	67 402 505	£25 320 648	£47 018 088	691 001 047	607 670 014	£104 006 220	£112 774 528	£113 172 004	£113 172 004	£113 172 004
scounted	£7,402,595	£25,320,040	£47,010,900	£81.001.047	£07 670 014	£104,990,330	£112,774,520	£113,172,004 £113,172,004	£113,172,004	£113,172,004
soounicaj	£1,402,595	240	1 030	2 179	1.51,019,914	£ 104,990,330	£112,774,528	11 3/0	12 820	1/ 173
Discounted)	97	240	1,039	2,170	4,554	6,583	9,009	11,349	12,039	14,173
	576 224	£177 751	1,039 £58,823	£71 136	£41,004	6,363 £51 757	9,009 £24,317	£76.401	£75.041	£94,920

Employment impact longitudinal (cont)

NPV @ 3.5% p.a.									
EVALUATION DATE:									
YEAR :	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	TOTAL
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
B. Total Costs (Cumulative)	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	2,236	2,241	2,649	2,649	2,649	2,649	2,649	888	33,287
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	1,605	1,440	1,524	1,364	1,222	1,094	979	294	
H. Total Benefits (Cumulative)	15,778	17,218	18,741	20,106	21,327	22,421	23,400	23,694	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
NET UNDISCOUNTED BENEFITS	1,605	1,440	1,524	1,364	1,222	1,094	979	294	
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£113,172,004
NET PRESENT COST* (Cumulative)	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
NET PRESENT BENEFITS* (Annual)	1,605	1,440	1,524	1,364	1,222	1,094	979	294	23,694
NET PRESENT BENEFITS* (Cumulative)	15,778	17,218	18,741	20,106	21,327	22,421	23,400	23,694	
TOTAL NET PRESENT COST* =									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined									
Costs	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
Costs (Discounted)	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	£113,172,004	
Benefits	15,778	17,218	18,741	20,106	21,327	22,421	23,400	23,694	
Benefits (Discounted)	15,778	17,218	18,741	20,106	21,327	22,421	23,400	23,694	
Cost per job	£70,529	£78,605	£74,267	£82,951	£92,649	£103,482	£115,582	£384,945	

Employment impact, new

NPV @ 3.5% p.a.										
EVALUATION DATE:		Oct-11				_				
EVALUATION TITLE:	Commercialisation P	rogramme								
YEAR :	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A. Total Costs (Annual)	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,404,071	£2,555,807	£130,605	£0	£C
B. Total Costs (Cumulative)	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732	£37,186,732
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	0	0	0	0	367	624	707	423	665	665
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
G. Total Benefits (Annual, post adjust adjust)	0	0	0	0	367	624	707	423	596	533
H. Total Benefits (Cumulative)	0	0	0	0	367	991	1,699	2,122	2,718	3,251
NET UNDISCOUNTED COST	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,404,071	£2,555,807	£130,605	£0	£C
NET UNDISCOUNTED BENEFITS	0	0	0	0	367	624	707	423	596	533
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
NET PRESENT COST* (Annual)	£2,432,389	£5,887,621	£7,129,770	£11,166,027	£5,480,441	£2,404,071	£2,555,807	£130,605	£0	£0
NET PRESENT COST* (Cumulative)	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732	£37,186,732
NET PRESENT BENEFITS* (Annual)	0	0	0	0	367	624	707	423	596	533
NET PRESENT BENEFITS* (Cumulative)	0	0	0	0	367	991	1,699	2,122	2,718	3,251
TOTAL NET PRESENT COST* =	£37,186,732									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined										
Costs	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732	£37,186,732
Costs (Discounted)	£2,432,389	£8,320,009	£15,449,780	£26,615,807	£32,096,248	£34,500,320	£37,056,127	£37,186,732	£37,186,732	£37,186,732
Benefits	0	0	0	0	367	991	1,699	2,122	2,718	3,251
Benefits (Discounted)	0	0	0	0	367	991	1,699	2,122	2,718	3,251
Cost per job	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	£87,381	£55,282	£52,383	£87,871	£62,424	£69,723

Employment impact new (cont)

NPV @ 3.5% p.a.									
EVALUATION DATE:									
EVALUATION TITLE:									
YEAR :	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	i Year 16	Year 17	TOTAL
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0) £0	£0	£37,186,732
B. Total Costs (Cumulative)	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	1,139	1,139	1,401	1,401	1,401	1,401	1,401	0	12,737
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	817	732	806	722	646	579	518	0	
H. Total Benefits (Cumulative)	4,068	4,800	5,606	6,328	6,974	7,553	8,071	8,071	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0) £0	£0	£37,186,732
NET UNDISCOUNTED BENEFITS	817	732	806	722	646	579	518	0	
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0) £0	£0	£37,186,732
NET PRESENT COST* (Cumulative)	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
NET PRESENT BENEFITS* (Annual)	817	732	806	722	646	579	518	0	8,071
NET PRESENT BENEFITS* (Cumulative)	4,068	4,800	5,606	6,328	6,974	7,553	8,071	8,071	
TOTAL NET PRESENT COST* =				ĺ					
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined									
Costs	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
Costs (Discounted)	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	£37,186,732	
Benefits	4,068	4,800	5,606	6,328	6,974	7,553	8,071	8,071	
Benefits (Discounted)	4,068	4,800	5,606	6,328	6,974	7,553	8,071	8,071	
Cost per job	£45,503	£50,824	£46,127	£51,520	£57,544	£64,272	£71,787	#DIV/0!	

Employment impact combined sample

NPV @ 3.5% p.a.										
EVALUATION DATE	Oct-11				_					
	Commercialisation F	Commercialisation Programme								
YEAR	: Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Total costs (undiscounted)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A. Total Costs (Annual)	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
B. Total Costs (Cumulative)	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
BENEFITS (undiscounted):										
G. Total Benefits (Annual, pre adjust)	97	142	799	1,139	2,744	2,653	3,994	1,904	2,330	2,330
Failure adjustment	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%
Acquisition adjustment	0%	0%	0%	0%	0%	0%	0%	0%	1.5%	1.5%
Adjustment factor (year)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.117
Adjustment factor (cumulative)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.117	1.248
G. Total Benefits (Annual, post adjust adjust)	97	142	799	1,139	2,744	2,653	3,994	1,904	2,086	1,868
H. Total Benefits (Cumulative)	97	240	1,039	2,178	4,922	7,574	11,568	13,472	15,558	17,425
NET UNDISCOUNTED COST	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
NET UNDISCOUNTED BENEFITS	97	142	799	1,139	2,744	2,653	3,994	1,904	2,086	1,868
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
NET PRESENT COST* (Annual)	£9,834,984	£23,805,673	£28,828,111	£45,148,086	£22,159,308	£9,720,487	£10,334,006	£528,080	£0	£0
NET PRESENT COST* (Cumulative)	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
NET PRESENT BENEFITS* (Annual)	97	142	799	1,139	2,744	2,653	3,994	1,904	2,086	1,868
NET PRESENT BENEFITS* (Cumulative)	97	240	1,039	2,178	4,922	7,574	11,568	13,472	15,558	17,425
TOTAL NET PRESENT COST* =	£150,358,735									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.										
Appraisal and Evaluation combined										
Costs	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
Costs (Discounted)	£9,834,984	£33,640,657	£62,468,768	£107,616,854	£129,776,162	£139,496,649	£149,830,655	£150,358,735	£150,358,735	£150,358,735
Benefits	97	240	1,039	2,178	4,922	7,574	11,568	13,472	15,558	17,425
Benefits (Discounted)	97	240	1,039	2,178	4,922	7,574	11,568	13,472	15,558	17,425
Cost per job	£101,270	£236,157	£78,152	£94,510	£47,296	£52,586	£37,517	£78,986	£72,081	£80,509
Employment impact combined sample (cont)

NPV @ 3.5% n

EVALUATION DATE:									
YEAR :	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	TOTAL
Total costs (undiscounted)	2014	2015	2016	2017	2018	2019	2020	2021	
A. Total Costs (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
B. Total Costs (Cumulative)	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
BENEFITS (undiscounted):									
G. Total Benefits (Annual, pre adjust)	3,375	3,379	4,050	4,050	4,050	4,050	4,050	888	46,025
Failure adjustment	10%	10%	10%	10%	10%	10%	10%	10%	
Acquisition adjustment	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Adjustment factor (year)	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	
Adjustment factor (cumulative)	1.393	1.556	1.738	1.942	2.169	2.422	2.705	3.022	
G. Total Benefits (Annual, post adjust adjust)	2,422	2,171	2,330	2,086	1,868	1,672	1,497	294	
H. Total Benefits (Cumulative)	19,847	22,018	24,348	26,435	28,302	29,974	31,472	31,766	
NET UNDISCOUNTED COST	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
NET UNDISCOUNTED BENEFITS	2,422	2,171	2,330	2,086	1,868	1,672	1,497	294	
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
NET PRESENT COST* (Annual)	£0	£0	£0	£0	£0	£0	£0	£0	£150,358,735
NET PRESENT COST* (Cumulative)	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
NET PRESENT BENEFITS* (Annual)	2,422	2,171	2,330	2,086	1,868	1,672	1,497	294	31,766
NET PRESENT BENEFITS* (Cumulative)	19,847	22,018	24,348	26,435	28,302	29,974	31,472	31,766	
TOTAL NET PRESENT COST* =									
* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.									
Appraisal and Evaluation combined									
Costs	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
Costs (Discounted)	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	£150,358,735	
Benefits	19,847	22,018	24,348	26,435	28,302	29,974	31,472	31,766	
Benefits (Discounted)	19,847	22,018	24,348	26,435	28,302	29,974	31,472	31,766	
Cost per job	£62,085	£69,244	£64,531	£72,076	£80,503	£89,916	£100,429	£511,432	

Appendix 6

Analysis Tables

Employment overview Investment overview Turnover overview

This Appendix has been omitted due to commercial sensitivities.

Appendix 7

Growing Business Analysis Longitudinal and New sample

This Appendix has been omitted due to commercial sensitivities.