



UK COMMISSION FOR  
EMPLOYMENT AND SKILLS

# Forecasting the Benefits of the UK Commission's Programme of Investments

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Intelligence Investment Impact

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# **Forecasting the Benefits of the UK Commission's Programme of Investments**

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## Foreword

The UK Commission for Employment and Skills supports growth by encouraging businesses to invest in the skills of their people. We work with and through our partners to improve the future of workforce skills by providing access to investment, world-class research and expert insight.

Our labour market information, research and evaluation insights provide timely intelligence to help shape the reform of the skills landscape in the UK, better to meet the needs of employers and to support growth. Our independent research programme has a UK wide, international, industrial sector and cross-policy perspective providing robust and objective assessment of what works and promoting good practice for the benefit of individuals, businesses, better policy making and improved delivery. We work closely with UK and international experts to co-ordinate our research programme and maintain its relevance and rigour.

Evidence Reports are an important means of sharing our research, but we also use more innovative means: infographics, presentations and blogs. We are keen to discuss the implications of our research with policy makers, practitioners, employers and individuals through social media, seminars and other events, often chaired by our Commissioners and test out our new policy insights through on-going reforms and developments in policy and practice.

Our Commissioners, who are drawn from big business, small business, trade unions, further and higher education, and the voluntary and Third Sectors, represent a form of social partnership. They provide vital insight in supporting the interpretation of our research.

The UK Commission is working with employers to support a wide range of innovative and sustainable solutions to transform skills provision in the UK so that it more effectively meets the skill demands of employers. The introduction of contestable investment through the Employer Investment Fund (EIF) and the Growth and Innovation Fund (GIF), has seen a step change in the design and delivery of skills infrastructure solutions in the UK.

This study forecasts the costs and potential economic benefits attributable to EIF and GIF. A conservative approach has been adopted throughout the study and one that aligns as far as possible with principles set out in HM Treasury Green Book guidance.

The results of this project provide an overall assessment of value for money and indicate that EIF and GIF investments, if sustained over time, have the potential to deliver a

significant level of economic return that compares favourably with other types of skills intervention. The study therefore makes an important contribution to the wider narrative that is emerging from the UK Commission's programme of investment evaluation.

We hope you find this report useful and informative. If you would like to provide any feedback or comments, or have any queries please e-mail [info@ukces.org.uk](mailto:info@ukces.org.uk), quoting the report title or series number.

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## Glossary of Key Terms

<b>Additionality:</b>	The net impact of intervention, accounting for deadweight, displacement and other wider effects.
<b>Aggregate supply:</b>	The total volume of goods and services supplied by the economy overall.
<b>Beneficiary:</b>	Individuals or employers deriving a benefit from public sector intervention.
<b>Costing schedule:</b>	Financial projections prepared by applicants setting out anticipated costs and income for proposed investment over a 2 or 3 year period.
<b>Crowding out:</b>	Reductions in private sector investment caused by increases in public sector expenditure.
<b>Discounting:</b>	Adjustment of future costs and benefits to reflect the extent to which individuals prefer receiving benefit (such as extra income) in an earlier year to an equivalent in a later year.
<b>Deadweight:</b>	The extent to which the observed outcome of interest would have happened in the absence of intervention.
<b>Delivery partners:</b>	Organisations responsible for the delivery of the UK Commission's investments.
<b>Displacement:</b>	Loss of market share amongst non-beneficiaries driven by any competitive advantage gained by beneficiaries as a consequence of public intervention.
<b><i>Ex-ante</i> evaluation:</b>	An assessment of the anticipated costs and benefits of intervention taking place prior to the delivery of public intervention.
<b>Ex-post evaluation:</b>	An assessment of the costs and benefits achieved by public interventions after or during delivery of the intervention.
<b>Group training activities:</b>	Delivery of training via groups of employers, such as collective procurement through networks or Group Training Associations.

<b>GVA:</b>	Gross value added - the value added to raw materials and other intermediate outputs in the process of production, which can be also be understood as approximate to income (wages and profits).
<b>Indirect multiplier effects:</b>	Spin-off benefits caused by increased demand amongst beneficiary employers for the goods and services produced by their supply chain.
<b>Induced multiplier effects:</b>	Increased demand for wider goods and services produced in the economy driven by growth in the earnings of workers.
<b>Investment plan:</b>	Documents prepared and agreed by delivery partners and UKCES describing plans for delivery and expected outputs and outcomes.
<b>Leverage:</b>	Complementary funding from the public or private sectors used to co-finance public intervention.
<b>Opportunity cost:</b>	Income foregone as a consequence of pursuing a particular course of action (e.g. the staff time lost in designing training programmes may lead to opportunity costs in the form of foregone productivity)
<b>Optimism bias:</b>	A systematic tendency to underestimate the costs and time required to deliver (and overstate the benefits of) investment projects at the planning stage.
<b>Outputs:</b>	The immediate deliverables of public intervention (e.g. number of businesses engaged or number of new training courses developed, number of members of employer networks)
<b>Outcomes:</b>	Effects realised as a consequence of outputs delivered (e.g. number of workers trained, increases in training expenditure)
<b>Productivity:</b>	The value of goods and services per unit of labour, capital and other factors employed in the production process.
<b>Spill-over effects:</b>	Increases in productivity facilitated by the diffusion of skills from trained to non-trained workers via learning-by-imitation, turnover of labour and other processes.

- Skills diagnostics:** Support provided to employers to help them understand any skills shortages or skills gaps present within their workforce.
- Substitution effects:** Substitution of one factor input (labour or capital) for another to take advantage of public sector support.
- Training brokerage:** Services provided to employers and training providers to help employers locate providers of appropriate workforce development or training services.

## **Executive Summary**

The UK Commission for Employment and Skills (UKCES) is responsible for two innovative, strategic skills investment funds: the Employer Investment Fund (EIF) and Growth and Innovation Fund (GIF). The purpose of the funds is to foster the development of sustainable training infrastructure designed to increase employer investment in skills and address skill needs on a sector basis.

This study was aimed at forecasting the costs and potential benefits of the investments. Overall, the study indicates that the investments have the potential to deliver a significant level of benefits and achieve relatively strong value for money.

### **Aims and objectives**

The primary objective of the study was to conduct an *ex-ante* evaluation to forecast the costs and potential economic and social benefits arising from EIF and GIF investments in alignment with the principles set out in the HM Treasury Green Book (HM Treasury, 2003).

An associated objective was to “operationalise” the appraisal approach used in the study by providing guidance on the type of supporting information that is needed from prospective investees in future in order to provide an optimal basis for future appraisal work.

Finally, the study aims to highlight ways in which the *ex-ante* results can be enhanced through future evaluation work and primary data collection.

A conservative approach has been adopted throughout this study to minimise the risk that overall projected benefits of EIF and GIF are overstated. As a consequence, more conservative assumptions have been adopted than in other comparable studies.

### **Employer Investment Fund and Growth and Innovation Fund**

In 2011 the UK Commission for Employment and Skills launched phase one of EIF, the first of its contestable challenge funds. Open to Sector Skills Councils to develop employer-led projects throughout the UK, EIF phase one marked a transition away from grant-in-aid (strategic) funding to encourage employers to invest more in the skills of their workforce. Two further phases of EIF followed along with a new fund, GIF. GIF opened out co-investment to any legally constituted employer representative body in order to encourage employers to work together collectively and provide leadership in developing innovative, sustainable skills infrastructure solutions in England.

Over the first two rounds 77 investments were funded through EIF and 16 investments funded through GIF. A light touch approach was adopted in the design of monitoring frameworks for the programmes to avoid defining a range of eligible activities and constraining innovation, as well as to minimise barriers to employer participation and leadership.

### **Analytical framework**

The investments funded through the EIF and GIF programmes address a range of market failures that constrain employer investment in training (including loss of trained staff to competitors, lack of incentives to provide public goods, and an inability of employers to internalise the full benefits of developing training infrastructure). The investments funded are diverse in nature, ranging from interventions directly engaging employers and individuals through to those with more indirect effects (such as activities focused on developing new training products or accrediting training provision).

Despite this diversity, the investments funded generally share the common goal of encouraging greater investment in training and supporting individuals into employment. The core assumption within this study's analytical framework is that such investment can be expected to lead to a range of business benefits (such as reduced waste, improved worker efficiency, or reduced labour costs). In aggregate, this will deliver economic returns in the form of productivity growth reflected in enhanced wages for employees, greater profits for employers and spill-over effects for the wider sector in which the firm operates.

The economic impacts of EIF and GIF have been largely treated as an expansion in aggregate supply, with short run displacement and multiplier effects assumed to be offset by adjustments in wages and the prices of goods and services.

Issues relating to how far investments would have gone ahead in the absence of UKCES investment have been considered out of scope to the present study (but will be addressed in subsequent stages of the investment evaluation programme). Instead, assessment of whether employers would have otherwise delivered the relevant training and employment outcomes in the absence of EIF and GIF infrastructure has been made on the basis of past evaluation evidence relating to similar interventions.

Finally, the study focuses on tangible outcomes. Investments may also lead to a wider range of intangible outcomes, but these have not been captured within the *ex-ante* assessment of impacts.

## Study scope

The scope of this study is limited to the first two rounds of EIF and GIF. A number of investments have been excluded from the assessment. This includes 10 pure research projects that are not expected to directly lead to the types of tangible employment and training outcomes that form the core focus of the review. Six participation projects targeting women (the Women In Work programme) were funded through EIF1 and it was agreed over the course of the study that these investments would also be excluded (aligning with the approach taken in other parallel work).

Additionally, a further 23 investments have been excluded as insufficient information on their expected outputs and outcomes was available. Overall, this *ex-ante* assessment focuses on 55 investments, accounting for £58m (65 percent) of total funding committed.

## Delivery Costs

During the period over which UKCES funding will be provided, total delivery costs associated with these investments are expected to total **£107m**, with **£48m** expected to be provided in the form of in-kind or cash contributions from employers (a leverage ratio of £0.82 per £1 of UKCES spending, broadly in line with comparable initiatives)<sup>1</sup>.

EIF and GIF emphasised the sustainable nature of skills infrastructure investment activity and there will be further maintenance costs associated with the delivery of infrastructure projects beyond this initial investment period. On the assumption that investments will prove sustainable for 10 years, the present value of long term delivery costs is estimated at between **£295m and £447m** (in 2011/12 prices). Once future costs are accounted for, leverage ratios may rise to up to £7 per £1 of UKCES spending (substantially outperforming other programmes if delivery can be sustained).

## Impacts on training and employment

Volumes of training and employment outcomes expected are significant, with the EIF and GIF investments expected by delivery organisations to potentially support **0.5m training episodes** (including substantial numbers of apprenticeships, mainly at higher levels). If investments are sustained for a period of 10 years and perform as expected, then these volumes could be substantially higher (in the order of **2m to 3m episodes of training**).

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<sup>1</sup> This figure refers only to the subset of EIF and GIF projects that were covered by the study and will not be consistent with estimates of leverage that relate to the full range of projects supported.

Applying a range of assumptions around the likely additionality of these training outcomes, it is estimated that this may translate into somewhere between **0.3 and 1.3m training episodes** that would not have happened in the absence of EIF and GIF (with the width of this band reflecting the uncertainty associated with effectiveness of particular types of activity in raising demand for training amongst employers).

### **Impacts on employer and public investment in training**

The delivery of this projected increased demand for training will be accompanied by increased levels of investment in training by employers (and in some cases, the public sector). Over 10 years, it is estimated that EIF and GIF may stimulate an additional **£1.3bn to £4.3bn** in expenditure on training amongst employers (in present value terms), alongside **£0.5bn to £0.7bn** in additional expenditure by the public sector.

The total cost to society of EIF and GIF over 10 years (including increased expenditure on training by employers and the wider public sector) is estimated at between **£2.1bn and £5.6bn** (in present value terms, in 2011/12 prices).

### **Cost effectiveness**

The overall cost to society per additional training outcome is estimated at between **£4,300 and £6,100**. Direct delivery costs per additional training outcome are estimated at between **£340 and £860**, and the cost to UKCES per additional training outcome at between **£40 and £160**. The achievement of these unit costs is in part contingent on the long term sustainability of investments (though both costs and volume of training outcomes delivered will fall in the event that this proves not to be the case).

There are relatively limited cost-effectiveness benchmarks available for comparable skills infrastructure projects. A 2009 National Audit Office review of the Train to Gain skills brokerage programme found a cost per gross learner (i.e. taking no account of additionality) of £970, and concluded that the service did not offer good value for money.

The EIF and GIF programmes may outperform the Train to Gain service, with projected *gross* delivery costs per training episode of less than £150.

### **Economic benefits**

The total present value of net economic productivity gains are estimated at between **£3.0bn and £10.0bn** (with approximately even contributions from wage gains, profitability gains, and spill-over effects). Productivity gains are skewed towards the later years of the 10 year time period under consideration, with around 90 percent of impacts expected to occur within the 2015/16 to 2021/22 period after UKCES funding has come to an end.

The scale of productivity gains is also contingent on the delivery of outcomes outside the funding period (and a number of investments were not planning to launch to market until close to the point at which UKCES funding came to an end). As a result, a substantial share of the expected benefits of EIF and GIF investments are contingent on their sustainability in the longer term and their ability to perform as anticipated.

### **Value for Money**

The table below provides an assessment of the value for money associated with the first two rounds of EIF and GIF<sup>2</sup>. The estimates below rely on the investments being sustained over time.

The analysis provides an assessment of value for money in terms of:

- **Return on public sector investment:** The £s of net economic benefits per £1 of public sector expenditure<sup>3</sup>. EIF and GIF are expected to deliver between **£2.85 and £6.32 per £1 of public sector expenditure** over the 10 year period under consideration. This compares favourably with returns from other types of skills intervention.
- **Return on UKCES investment:** The £s of social benefits per £1 of UKCES spending<sup>4</sup>, providing a measure of the efficiency of UK Commission funding in delivering the economic benefits involved. EIF and GIF investments are expected to deliver between **£18.41 and £81.95 in net social benefits per £1 invested**. As UK Commission funding is a small component of the overall costs involved, these measures are highly sensitive to differences in the total benefits estimated under the different scenarios.
- **Benefit to cost ratios (BCR):** The overall £s of economic benefits per £1 of resource costs incurred in the delivery of the investments<sup>5</sup>. The overall benefit to cost ratio for EIF and GIF over the 10 year period under consideration is estimated at between **£1.46 and £1.79 per £1 of resource costs**.

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<sup>2</sup> The estimates are presented as a range because alternative assumptions are made about the level of training outcomes that may be delivered over the 10 year period and also the proportion of outcomes that are said to be additional. The ranges reflect the degree of uncertainty.

<sup>3</sup> Measured as (Total Benefits – Costs to Employers – Leverage) / (Costs to UKCES + Costs to Wider Public Sector)

<sup>4</sup> Measured as (Total Benefits – Costs to Employer – Costs to the Public Sector – Leverage) / Costs to UKCES

<sup>5</sup> Measured as Total Benefits / (Delivery Costs + Wider Costs to Employers + Wider Costs to the Public Sector)

**Table 1 Value for money measures (£s of benefits per £1 of costs)**

Cost / Benefit / VFM measure	2011/12 to 2014/15	Total	EIF	GIF
<b>Costs</b>				
UKCES funding (£m)	54	54	43	11
Employer contributions	45	45	25	20
Costs 2014/15 to 2021/22	0 - 0	196 – 348	111 – 217	86 - 131
Indirect costs – Employers	348 - 921	1,320 – 4,339	985 – 3,107	335 – 1,231
Indirect costs - Public Sector	85 - 137	458 - 771	152 – 372	306 - 399
<b>Total costs</b>	<b>532 - 1157</b>	<b>2,073 – 5,557</b>	<b>1,312 – 3,763</b>	<b>760 – 1,790</b>
<b>Benefits</b>				
Productivity gains	271 - 705	3,022 – 9,958	2,366 – 7,702	657 – 2,255
<b>Appraisal measures</b>				
BCR	0.51 - 0.61	<b>1.46 - 1.79</b>	1.80 - 2.05	0.86 - 1.26
Return on public sector spending	-0.87 - -1.36	<b>2.85 - 6.32</b>	6.40 - 10.49	0.67 - 2.13
Return to UKCES spending	-3.79 - -7.31	<b>18.41 - 81.95</b>	25.51 - 92.62	-8.63 - 43.27

## Benchmarking

There are some difficulties in translating these estimates into measures that can be straightforwardly compared with other programmes. Other studies measure productivity gains on lifetime basis, rather than over the 10 years under consideration here, and some do not factor in additionality.

When estimated on a comparable basis, the findings would suggest that the EIF and GIF programmes are projected to deliver a rate of return that is potentially in the upper ranges of what might be expected for interventions of this type.

While the programmes may not reach the rates of return associated with apprenticeships (as estimated by the 2012 National Audit Office review of apprenticeships), this may represent an upper bound for what might be achievable as they are based on those employers that do not require further encouragement to invest in such training (NAO, 2012).

The EIF and GIF programmes are predicated on the assumption that further public expenditure is required to encourage additional employer investment in skills, and as a consequence, benefit-cost ratios will inevitably be lower than estimated by the NAO.

While the potential rates of return may be relatively high, there are also substantial risks involved. In particular, higher rates of return are contingent on the on-going sustainability of investment activity. This cannot be guaranteed, and if a large number of investments fail to reach a position in which their maintenance can be sustained over a long duration of time, then the return on public spending may fall substantially.

### **Limitations to this analysis**

The following points of scope, and the limitations associated with this, should be borne in mind in the review of this *ex-ante* evaluation assessment:

- **Incomplete coverage of benefits:** The assessment of likely benefits is driven primarily by the volume of training outcomes anticipated by investments. However, many investments may lead to intangible benefits (such as improved confidence in the skills system to deliver the skills needed in certain industries) that have not been captured through this assessment. Additionally, the *ex-ante* evaluation primarily focuses on volume effects though many EIF and GIF investments will enhance the quality of training provided. To the extent this is reflected in an increase in demand for training, these effects are captured. However, there may be additional benefits for those employers moving from lower to higher quality provision: these types of effect are substantially more challenging to quantify and have been excluded from this assessment.
- **Monitoring information:** The results of the *ex-ante* impact assessment are constrained by the scope of the monitoring information available. The results of this analysis are also based primarily on the investment plans agreed with delivery partners following appraisal at the outset of their project and some investment plans have been subject to subsequent contract variations. Additionally, long term projections for future costs and benefits were not routinely available from delivery partners. Planning assumptions have been applied to overcome this gap in the evidence base, but there is substantial uncertainty over these future projections. However, as projected outcomes are self-reported by investees, there is a risk they prove optimistic in the long run.

- **Additionality:** The *ex-ante* assessment of impact integrates an assessment of deadweight (i.e. how far any growth in training and associated economic effects might have occurred in the absence of EIF and GIF investment) on the basis of the available evaluation evidence. In many cases, the evaluation evidence is either based on self-reporting methods or does not have substantial depth, leading to uncertainty over the potential additionality of different types of activity.

# 1 Introduction

This report sets out the results of a project aimed at forecasting the costs and likely benefits of the UK Commission for Employment and Skills' programme of investments, describing the methodological framework development, available evidence and assumptions made.

## 1.1 Study aims and objectives

The primary objective of this study is to:

- Conduct an *ex-ante* evaluation to forecast, using existing or proxy indicators, the costs and likely economic and social benefits attributable to Employer Investment Fund (EIF) and Growth and Innovation Fund (GIF) investments as a basis for assessing potential return on investment (aligning as far as possible with the principles set out in the HM Treasury Green Book).

The aims of this study are to:

- Inform the evaluation of existing investment projects, with specific regard to the potential impact and return on investment of those projects and the investment programme overall;
- Inform the type of supporting information that is requested from prospective investees (e.g. ways in which project outputs are specified) in order to improve the basis of *ex-ante* assessment of investment activity in the future;
- Inform the assessment process for investment proposals by developing a simple methodology for quantifying the potential benefits and return on investment in a way that is consistent and comparable;
- Inform the scope of future investment proposals by providing evidence to prospective investees regarding those types of investment that are likely to generate the highest benefits and returns.

A conservative approach has been adopted throughout this study to minimise the risk that the overall projected benefits of EIF and GIF are overstated. As a consequence, more conservative assumptions have been adopted than in other comparable studies.

A 'Ready Reckoner,' a simple spreadsheet appraisal tool for internal UK Commission use (grounded in the same methodology as the overall study) was also developed as part of the research. An outline of the model developed is provided in Appendix C.

## 1.2 The Employer Investment Fund and Growth and Innovation Fund

In 2011 the UK Commission for Employment and Skills launched phase one of the Employer Investment Fund (EIF), the first of its contestable challenge funds. Open to Sector Skills Councils to develop employer-led projects throughout the UK, EIF phase one marked a transition away from grant-in-aid (strategic) funding to encourage employers to invest more in the skills of their workforce. Two further phases of EIF followed along with a new fund, the Growth and Innovation Fund (GIF). GIF opened out co-investment to any legally constituted employer representative body in order to encourage employers to work together collectively and provide leadership in developing innovative, sustainable skills infrastructure solutions in England.

Over the first two rounds 77 investments were funded through EIF and 16 investments funded through GIF. A light touch approach was adopted in the design of monitoring frameworks for the programmes to avoid defining a range of eligible activities and constraining innovation.

The **scope** of this study is limited to the first two rounds of EIF and GIF. . The range of activities delivered through programmes is diverse, including development of new training products, accreditation initiatives, brokerage services, and creation of networks. Owing to information constraints, it has not been feasible to cover all investments in this *ex-ante* assessment, as described in section 1.4 below and in more detail in section 2. Overall, this *ex-ante* assessment focuses on 55 investments, accounting for £58m of total funding committed (65 percent of the total £90m committed under rounds one and two of EIF and GIF).

Investment projects were also underway at the point at which the study was undertaken (and a number of investments funded in earlier rounds were complete). As a result, the study is not a 'pure' *ex-ante* evaluation (which would normally be undertaken at the point at which applications for funding are received as a means of providing evidence to support the resource allocation process).

## 1.3 Approach

This report has primarily been developed on the basis of a review of performance management information covering the nature of investments funded through EIF and GIF: their expected costs and outcomes; a review of academic and other research on the economic and social benefits of training activity; and an examination of other *ex-ante* evaluation approaches that have been adopted in similar contexts.

The study involved the following tasks:

- **Review of programme documentation:** A comprehensive review of investment project documentation was undertaken to synthesise the information captured in investment plans, costing schedules, and application forms submitted to UKCES. This provided a base of information on expected costs, outputs, and outcomes associated with EIF and GIF investments.
- **Review of academic and other government research:** A parallel review of the available academic and other government research was undertaken with a view to identify existing and proxy indicators to use to develop an economic model of the different types of intervention funded through EIF and GIF, and to reach a plausible approach to accounting for issues associated with additionality (i.e. how far the economic and social benefits of intervention would have otherwise occurred in the absence of UKCES funding)<sup>6</sup>.
- **Analytical framework:** The development of a framework for undertaking the *ex-ante* assessment of impacts, incorporating a theoretical framework for understanding the economic and social benefits of EIF and GIF activity, an assessment of the strengths and weaknesses of the evidence base, and an outline of required assumptions.
- **Auditing process:** A small number of delivery partners were subject to a separate auditing process over the course of the study. The study piggybacked onto this existing process to collect additional information to fill gaps identified in the costs, outputs and outcomes and forward plans of investments (where available).
- **Consultation exercise:** Finally, all delivery partners (other than those engaged through the auditing process) were provided with a spreadsheet summary of the costs, outputs and outcomes defined in their investment plans. Delivery partners were asked if it was possible to provide additional information where gaps had been identified.

All monetary results in the study have been presented in 2011/12 prices (the first year of EIF and GIF expenditure), with financial estimates beyond this date deflated using the HM Treasury GDP Deflator in future years. A discount rate of 3.5 percent per annum (again, with a base year of 2011/12) has been applied to reflect the social rate of time preference recommended in the HM Treasury Green Book.

## 1.4 Scope

The following points of scope, and the limitations associated with this, should be borne in mind in the review of this *ex-ante* evaluation assessment:

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<sup>6</sup> This may introduce a bias in the results, as it is likely that only those studies finding positive results will have reached publication.

- **Coverage:** On the expectation that pure research projects will not directly lead to delivery of training outputs and outcomes (although they may indirectly do so through supporting the development of future initiatives), these types of investment have been excluded from the analysis (accounting for 10 investments). Six participation projects targeting women (the Women In Work programme) were funded through EIF1 and it was agreed over the course of the study that these investments would also be excluded (aligning with the approach taken in other parallel work). See section 2.7 for more details.
- **Intangible benefits:** The assessment of likely benefits is driven primarily by the volume of training outcomes anticipated by investments. However, many investments may lead to intangible benefits that have not been captured through this assessment (this might include greater confidence in the skills system amongst employers) which may ultimately lead onto tangible benefits (such as greater levels of inward investment). However, due to the lack of evidence any assessment would be purely speculative and has been excluded from this study.
- **Quality of training:** This *ex-ante* evaluation primarily focuses on volume effects (increases in the quantity of training demanded). Many EIF and GIF projects may have the effect of enhancing the quality of training provided. To the extent that this is reflected in an increase in demand for training, these effects are captured. However, there may be additional benefits for those employers moving from lower to higher quality provision. These types of effect are substantially more challenging to quantify and have been excluded from this assessment.
- **Quality of monitoring information:** The *ex-ante* assessment needed to work within the constraints of the quality of the monitoring information available. In some cases, monitoring indicators agreed do not describe the expected training outcomes associated with investments. As far as possible, attempts have been made within this study to address these gaps through either collecting additional evidence from delivery partners, or making assumptions on the basis of other investments delivering similar activities.
- **Contract variations:** The results of this *ex-ante* assessment are based primarily on the investment plans agreed with delivery partners following appraisal at the outset of their project. Some investment plans have been subject to subsequent contract variations and these are not reflected in this study.

- **Projections:** Although delivery partners were asked as part of the study to provide long term projections of their plans for future maintenance of the investments funded, this type of long term planning projections was something only very few delivery partners had developed (there was no requirement to develop this type of projection as part of the application process). In order to project the future costs and benefits of EIF and GIF investments, some straightforward planning assumptions were made. These are laid out clearly in the following section. However, there is substantial uncertainty over value for money beyond the lifetime of UKCES funding, and figures based on these assumptions are set out separately throughout.
- **Reliance on secondary evidence:** The evidence utilised to complete this review is limited to performance management data available from monitoring systems and wider research on the economic impacts of training. This evidence does not permit detailed scrutiny of some questions that may be of interest, for instance how far the investments themselves would have proceeded in the absence of UKCES funding. An ex-post evaluation of the programmes would deal with these questions in depth, and relevant issues are highlighted both in the report and in the conclusions.
- **Additionality:** The *ex-ante* assessment of impact integrates an assessment of deadweight (i.e. how far any growth in training and associated economic effects might have occurred in the absence of EIF and GIF investment). Relevant assumptions have been made on the basis of the available evaluation evidence. In many cases, the evaluation evidence is either based on self-reporting methods or does not have substantial depth (small numbers of relevant studies). Realistic expectations are needed on how far it is possible to evaluate Government interventions to a sufficient level of quantitative robustness to eliminate all uncertainty in this area (particularly as some of the types of initiative concerned are challenging to evaluate in this way), but this does lead to some uncertainty over the potential additionality of different types of activity.

## 1.5 Structure of this report

The remainder of this report is structured as follows:

- **Section two: Analytical framework** – this section outlines the methodological framework for projecting the economic and social benefits of EIF and GIF and the key assumptions made.
- **Section three: Delivery costs** – this section provides estimates of the inputs likely to be absorbed by EIF and GIF interventions through the development and maintenance of the infrastructure involved.

- **Section four: Training outcomes and costs** – this section provides estimates of the anticipated training and employment outcomes associated with EIF and GIF interventions, alongside estimates of the indirect costs incurred by employers in delivering those training outcomes.
- **Section five: Impacts of EIF and GIF** – this section provides estimates of the anticipated economic and social benefits of EIF and GIF interventions.
- **Section six: Value for money** – this section provides an overall assessment of value for money and benchmarks EIF and GIF against related programmes.

Appendix A is a detailed technical paper with additional detail on the assumptions employed in the *ex-ante* modelling of costs and benefits. Appendix B sets out the internal 'Ready Reckoner' spreadsheet tool to aid the appraisal for future investment proposals.

Appendix C summarises an indicative assessment of the potential health impacts of EIF and GIF and appendix D details the supporting evidence base on which this study drew upon.

## 2 Analytical Framework

This section sets out an analytical framework for estimating the costs and benefits of the EIF and GIF programmes. The primary focus of this section is to:

- Establish an underlying framework by which economic and social benefits can be understood and attributed to the UK Commission's programme of investments and determine how a rate of return on these investments can be assessed, aligning with the principles outlined in the HM Treasury Green Book.

This section provides an assessment of the underpinning rationale for investments funded through the EIF and GIF programmes and defines their relevant inputs, activities, outputs, outcomes and impacts and how they are treated in the *ex-ante* evaluation. Consideration is also given to issues relating to additionality (i.e. how far the economic and social impacts would have occurred in the absence of UKCES funding) and persistence (how long impacts might be expected to endure).

A check list of the assumptions set out in this chapter is provided in Appendix A.

### 2.1 Rationale for intervention

EIF and GIF invite applications for investment in skills infrastructure designed to raise employer investment in skills. Each investment has its own rationale for intervention, responding to sector specific issues and market failures. However, in broad terms, the investment portfolio can be thought of as responding to the following key market failures:

- **Poaching externalities:** Sub-optimal investment in training by employers is often thought of as being driven by poaching externalities. The potential loss of staff to competitors creates disincentives for employers to invest in their skills and training since they may not be able to internalise the full benefit of doing so. Many EIF and GIF investments aim to reduce the costs of planning training to employers to address these issues and to encourage a collaborative approach to training amongst employers in the same sector or locality.
- **Information asymmetries:** Employer investment in training can be constrained by an information asymmetry where training providers have a greater understanding of how far their provision will meet the employers' skills needs than the employer. Some EIF and GIF investments aim to address this issue through signalling mechanisms (such as accreditation) to give employers greater confidence that training will meet their needs.

- **Co-ordination failure:** The development of training products and services that create benefits for an entire sector may be constrained if a single employer cannot claim the full benefits of doing so (hindering the implementation of collective action in the interest of the group as a whole). A number of investments aim to address these co-ordination failures through the creation of training standards and other public goods (such as information portals).
- **Network externalities:** Networks can offer a range of benefits to members: such vehicles can support more cost-effective collective procurement of training and provide a mechanism by which the sector level training needs can be articulated. The value of a network is typically proportional to its size, and willingness to pay for membership of a network in its infancy may be low. As a consequence, public sector funding may be needed in the early stage of employer network development.

There may also be broader market failures involved where general public sector intervention in the training market severs commercial links between training providers and employers. Where training providers are rewarded for their ability to attract individual learners, provision will not necessarily be tailored to the needs of employers. A number of EIF and GIF investments aim to bring employers and training providers closer together to overcome these incentives and improve the quality of training supply.

## 2.2 Logic Chain

A logic chain for the programme, based on parallel work undertaken examining the feasibility of a programme level beneficiaries survey of EIF and GIF, (UKCES, 2013a) is set out in Figure 2.1 overleaf<sup>7</sup>. This gives an overview of the anticipated chain of causality between inputs, activities, outputs, outcomes and impacts of EIF and GIF. The logic chain also outlines the mechanisms by which change is expected (highlighted in circles).

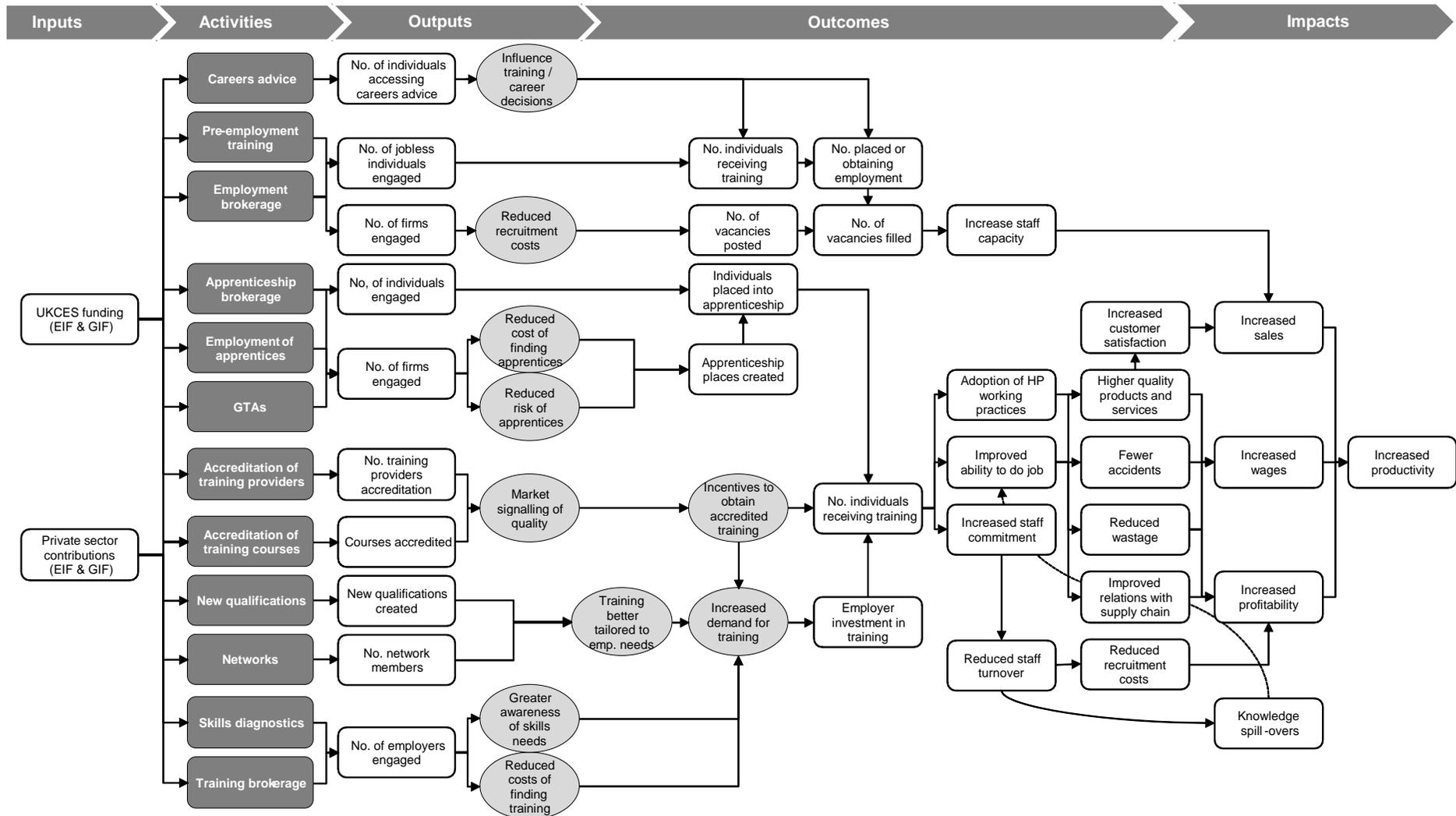
For example, the accreditation of qualifications might be expected to create market signals around the quality of that training, creating incentives for employers to obtain that training (mechanisms of change) and leading to growth in the number of workers trained (training outcomes), and then to improved efficiency and other business performance benefits (business outcomes). These outcomes are expected to lead to economic impacts in the form of productivity growth (impacts).

The following sections outline the *ex-ante* evaluation issues associated with each of the elements of the logic chain in turn.

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<sup>7</sup> This study explores the potential to undertake a programme wide survey of beneficiaries of EIF and GIF to support an assessment of the overall impacts of the two programmes.

Figure 2.1 Logic Model - Employer Investment Fund and Growth and Innovation Fund



## 2.2.1 Inputs

In line with HM Treasury Green Book principles, the *ex-ante* evaluation has been developed to account for all costs incurred as a consequence of the investments made as part of the EIF and GIF programmes (as far as feasible). There are two key components that that have been accounted for:

- **Delivery costs:** A range of staff and other resource costs will be incurred by delivery partners in the development and delivery of EIF and GIF investments. These costs will be met by UKCES funding received through the programmes, in-kind and cash contributions made by employers, and any income received through fees associated with the infrastructure involved (such as accreditation fees).
- **Indirect costs and expenditures:** In general, the aim of EIF and GIF investments are to encourage employers to invest more in training. Further indirect expenditures will be made by employers and the wider public sector if they are effective in doing so (such as increased training expenditure or the cost to FE colleges of providing formal learning to apprentices). Engagement with the products and services developed through EIF and GIF may also absorb the time of HR professionals and other managers, resulting in additional opportunity costs in the form of foregone productivity.

### Treatment of costs

Some consideration is also needed as to how costs are best handled within an *ex-ante* assessment of impacts. While the majority of costs involved are relatively unproblematic, a number of specific financial costs have been given special treatment in the analysis.

A number of investments incurred pure research costs (such as the production of labour market intelligence reports) that do not contribute directly to delivering the training outcomes of interest. These costs have as far as possible been excluded as their benefits cannot be adequately quantified (resulting in the exclusion of 10 investments identified that represent pure research projects).

Secondly, a small number of investments (mainly Apprentice Training Agencies) have involved the direct employment of apprentices to limit the risks involved to participating small and medium enterprises (SMEs). While wage payments to the apprentice are made by the organisation establishing infrastructure, these costs are recovered by making separate charges to the SMEs, and to avoid double counting these costs have been treated as transfer payments and excluded.

Finally, there may be foregone output associated with any staff time involved in engaging with the products and services developed with EIF and GIF (i.e. an opportunity cost). However, there is limited quantified evidence upon which such an assessment might be made and these costs have been excluded. In the main, the value of any economic output lost may be marginal (particularly if those tasks left uncompleted are those contributing the least value to operational performance). However, if firms have been encouraged to develop extensive training programmes or have put in place additional staff to manage their relationships with employer networks, then these costs could be significant. As a result, the analysis will underestimate the extent of the indirect costs involved.

## 2.2.2 Activities

The portfolio of investments funded through EIF and GIF spans a wide range of activities using different levers to induce changes in the behaviour of individuals, employers, and training providers. Individual investments often use a combination of different activities, and a mixture of beneficiary groups. The activities have been categorised into a broad typology centred on the key routes by which EIF and GIF interventions are aiming to achieve their intended outcomes set out in table 2.1<sup>8</sup>.

**Table 2.1 Typology of Activities**

Broad type	Activity	No. of investments
Employee / individual targeted	<b>Careers advice and guidance:</b> Activity aimed at helping individuals understand the skill demands of occupations and encouraging new entrants to sectors. These activities range from using online careers portals through to more traditional exhibitions at careers fairs.	24
	<b>Pre-employment training:</b> Activity focused on helping unemployed individuals acquire the skills they need to enter a particular occupation. Investments tend to involve the establishment of delivery vehicles rather than direct provision of training.	7
Employer targeted	<b>Skills diagnostics:</b> Engagement of employers through an assessment of skills needs in the workplace taking a range of forms including face to face activity through to on-line delivery.	19
	<b>Employment of apprentices:</b> Interventions focused on reducing the risk of taking on apprentices. Delivery vehicles (mainly ATAs) employ the apprentices over the course of their apprenticeship, reducing financial and contractual risks to the employer.	1
Training provider focused	<b>Accreditation of training providers:</b> Activities involving the accreditation or licensing of training providers. This includes labelling, quality kite marking, and the creation of licenses to allow training providers to deliver specific training courses.	8
Brokerage	<b>Training brokerage:</b> Directly brokerage of training solutions to employers. These interventions may facilitate both growth in training activity and help employers obtain more effective training.	12
	<b>Apprenticeship brokerage:</b> A number of investments have involved the brokerage of apprenticeship places, simplifying the process by which employers fill places.	9

<sup>8</sup> The Programme Level Beneficiary Survey Feasibility Study (UKCES, 2013a) maps the activities identified in table 2.1 to the different stakeholder groups that might derive a benefit from the programme (individuals, employers and training providers).

Broad type	Activity	No. of investments
	<b>Employment brokerage:</b> Some activity funded involves the brokerage of unemployed individuals into specific vacancies. This includes less formal mechanisms have been developed that might also be thought of as brokerage activities - such as development of databases of those completing specific qualifications to help employers find appropriately skilled workers at a later stage.	9
Training products	<b>Creation of new qualifications:</b> Development of new qualifications or training provision that provide the skills needed by the industries concerned.	8
	<b>Accreditation of training courses:</b> Definition of quality standards defining the qualifications that provide the skills needed for particular occupations. This includes voluntary licences to practice and kitemarking or accrediting specific courses.	23
Group based	<b>Collaborative approaches to training (GTAs):</b> Group Training Associations, an apprenticeship system in which apprentices are employed by a group of employers, completing placements with each employer (reducing the overall risk of taking on apprentices).	4
	<b>Networks:</b> Development of networks of employers and (in some cases) training providers to provide forums by which the training needs of employers can be articulated, as well as vehicles to support the collective procurement of training.	12
Other	<b>Research:</b> Some investments have been made in activity that is purely research to support the future development of training infrastructure.	20

*Note: a single investment may involve the delivery of multiple types of activity*

### 2.2.3 Outputs and Outcomes

As illustrated in the logic chain, the activities funded through EIF and GIF are expected to deliver a wide number of immediate outputs (ranging from engagement of individuals and employers through to the creation of new training products). However, it is assumed that these outputs can be expected to deliver two key intermediate outcomes:

- Increases in the volume and quality of training provided to employees; and,
- Increases in the number of vacancies filled.

These intermediate outcomes are expected to lead onto a wide array of tangible business outcomes as highlighted in the logic model (i.e. outcomes that can be measured and are likely to be directly reflected in the financial performance of the business). Training may be most typically expected to lead to an increase in the efficiency of workers (i.e. an increase in the volume or quality of their work), potentially leading to direct increases in the profitability of firms (with other things being equal, such an increase in efficiency would enable businesses to secure a greater volume of sales per worker employed).

However, these business outcomes may have more indirect effects on the performance of businesses. There is some evidence to suggest that training helps to reduce levels of waste (as a consequence, for example, mistakes being made in the production process), which will also help drive up profitability through reducing costs. Additionally, investment in the skills of the workforce may also help increase staff motivation, helping to reduce recruitment costs by increasing the loyalty of staff, as well as potentially leading to increased sales via improved customer satisfaction.

This *ex-ante* evaluation focuses solely on **tangible outcomes**. Investments may have a range of wider intangible outcomes that are more difficult to measure, but may lead onto more tangible effects. For example, the development of employer led skills infrastructure may give employers greater confidence that the skills system will supply the types of skills they require to introduce innovative new technologies or expand their operations to help them supply larger markets. While the change in confidence will be difficult to measure, it possible that such intangible outcomes could lead on to substantial economic impacts (for example, if a foreign investor chooses to locate a new production facility within the UK to serve international markets). However, these types of effect have not been incorporated within this *ex-ante* assessment as any attempt to do so would likely be highly speculative.

#### **2.2.4 Economic impacts**

It is assumed that the intermediate business outcomes outlined above will in aggregate be reflected in productivity growth (an increase in the volume of GVA produced per unit of labour and capital employed in production). The overall value of these gains will be determined by:

- **Wage gains to employees:** In perfectly competitive labour markets, a marginal increase in the productivity of workers will be reflected in a marginal increase in the wage. The intuition underlying this theory is that in such a labour market, if employers were able to profit by offering workers a wage that was lower than their marginal product, there would be incentives for competing firms to offer higher wages. This process would continue until workers received a wage that fully reflected their contribution to firm profitability (offering wages at higher rate would lead to a loss of profitability). A substantial volume of research has been undertaken to examine the links between training and wage gains. Assumptions were derived from this literature and applied to volumes of training outcomes expected (set out in detail in Appendix D) to reach an estimate of the wage gains associated with EIF and GIF investments.

- **Increased profitability:** A number of studies suggest the overall benefits of training are not all claimed by workers: employers also gain through enhanced profitability. A review of European research studies suggested that increases in firm level productivity as a consequence of training are twice as large as the wage gains accruing to learners. This assumption was applied to estimated wage gains to reach estimates of the benefits to firms in the form of increased profitability, in line with comparable approaches developed by UKCES and BIS (see BIS, 2012a).
- **Spill-over effects:** Finally, there is some evidence to suggest that training leads to spill-over effects (Dearden *et al*, 2006, and De Grip, 2012). This occurs both through peer effects where trained workers help others gain skills, both within firms investing in training and by knowledge transfer achieved through labour turnover and poaching. Some studies have suggested that impact of training is twice as large at the level of industry as at the level of the firm, though a more conservative assumption that spill-over effects are half this magnitude has been applied here to reflect the limited scope of evidence available.

In addition to these productivity effects, there may be additional economic benefits where employers have been able to fill vacancies as a consequence of pre-employment support and employment brokerage activities. This increase in the capacity of employers may help them **increase sales**, thereby leading to increased **output** (GVA).

### 2.2.5 Wider Benefits

A range of research has shown a relationship between the receipt of training and other wider social benefits (including health, crime, and social cohesion). Estimates of these wider benefits have been incorporated in this assessment primarily in terms of health impacts. Higher levels of education are associated with lower prevalence of unhealthy lifestyle choices (such as smoking and heavy drinking). Indicative estimates of the health benefits involved (based on potential Quality Adjusted Life Years gained) have been provided<sup>9</sup>.

The available literature has not been able to demonstrate a causal relationship between these outcomes. Given the low level of confidence and non-core nature of the impacts involved, estimates have been kept strictly separate from core results and are presented for interest only (in Appendix C).

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<sup>9</sup> QALYs are a measure of life expectancy adjusted for the quality of life (one QALY is a year of life unaffected by health issues) while lower values represent the quality of life that might obtain under different categories of disease.

## 2.3 Variation in costs and benefits

The costs and economic impacts associated with training outcomes will vary substantially depending on the character of both the training involved and the employees benefitting. This section provides an outline of the underlying sources of this variation, and how far it has been possible to take this into account within the study:

- **Type of training:** The secondary evidence suggests that higher levels of training tend to lead to greater productivity benefits, reflected in higher wages (BIS, 2011). This *ex-ante* assessment has taken this into account relying on the information on the level of training outcomes involved that was available from delivery partners.
- **Prior attainment:** The impact of training will generally be larger where employees are progressing to higher qualification levels. No evidence was available on the prior attainment of those expected to receive training, and a simplifying assumption has been made that all workers starting vocational qualifications are progressing to higher attainment levels<sup>10</sup>.
- **Employee characteristics:** The productivity benefits of training will vary according to the characteristics of employees (such as age and gender). The impacts of training older workers will typically be lower as there are fewer working years of which productivity effects can potentially accumulate (and the greater experience of older workers may mean a given training course may have smaller marginal effects). No evidence was available on the characteristics of those receiving training and the *ex-ante* assessment is not sensitive to this source of variation.
- **Sector:** The impacts of vocational training vary substantially by sector, with the costs and productivity benefits tending to be more significant in manufacturing and construction industries than in the general service sector. Sector variation in the relative benefits (and costs) of training has been accommodated in these *ex-ante* estimates.

Although sector was accommodated in the assessment for all activities covered through the study, there was some variation in how level of training was treated in the analysis. Table 2.2 below shows the assumed outcomes associated with each of the activity types highlighted above.

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<sup>10</sup> Assumptions on completion rates were based on historic rates for comparable qualifications published by BIS (2013)

**Table 2.2 Activity level assumptions on types of training or employment outcomes**

Activity types	Types of outcomes expected
Careers advice	Careers advice and guidance could potentially lead to any type of further learning, and information provided by delivery partners related almost exclusively to the number of individuals engaged. The training outcomes involved have been described as 'general training outcomes' and have been estimated by applying the estimates of deadweight to volumes of learners engaged (reflecting the nature of the available secondary evidence).
Pre-employment support	Pre-employment support can potentially lead to both training and employment outcomes. Where available, full details on the level of vocational learning have been included in the assessment, although where this was absent, these are described as 'general training outcomes.'
Employment brokerage	Employment brokerage is assumed to only deliver employment outcomes (i.e. vacancies filled rather than the creation of new jobs).
Training brokerage	No information was available on the level of training expected through training brokerage mechanisms and it was assumed that all activity in this area will lead to general non-accredited off-the-job training. Where information on levels of likely training outcomes was unavailable from investment documentation, an assumption that 1.68 workers per employer would receive training (based on the projected performance of other analogous investments).
Skills diagnostic	Skills diagnostic activity was also assumed to lead to general non-accredited off-the-job training. Again, where information on training outcomes was unavailable, an assumption that 7.66 employees would receive training per firm engaged was made based on the expected performance of other similar investments.
Apprenticeship brokerage	Apprenticeship brokerage activities were assumed to deliver apprenticeship outcomes alone. Where the level involved was unknown, averages across different types of apprenticeship were used.
Group Training Associations (GTA)	GTA activities were assumed to deliver apprenticeship outcomes alone. Where the level involved was unknown, averages across different types of apprenticeship were used.
Employment of Apprentices	These activities are very similar to apprenticeship brokerage activities and similar assumptions were adopted.
Accreditation of training providers	Information on training outcomes associated with the accreditation of training providers, training courses, and new qualifications were only captured where they were provided by delivery partners. Projected volumes of completers for these types of activity were highly variable so no assumptions were developed to make inferences where no outcomes data was available.
Accreditation of training courses	
Creation of new qualifications	
Networks	No training outcome data was available for network activities (either from project documentation or consultations). While there is general secondary evidence to show that network membership has a positive influence on training expenditure, this link has not been precisely quantified, and as such it has not been possible to develop a set of assumptions to describe the potential impacts of these activities. These activities have been wholly excluded from the analysis <sup>11</sup> .

## 2.4 Timing issues

A range of timing issues have been addressed in this assessment of EIF and GIF:

- Sustainability of investments:** EIF and GIF investments have been made on the basis that activity will be sustained over the long term. This *ex-ante* assessment has been made on the basis of a **ten year appraisal window** (reflecting the outer limits of plans made by delivery partners to sustain their activity and implying a rate of depreciation of ten percent per annum). This implies an assumption that investments will prove sustainable in the long term.

<sup>11</sup> See for example a UKCES report (UKCES, 2009) that concluded that 'the economic benefits of employer networks depend on firstly, the extent to which spending on employer networks generates additional investment in training and secondly, the relationship between training and increased economic output. There is precise quantified evidence for the second of these links. However it does not exist for the first of these.'

- **Future costs and outcomes:** If EIF and GIF investments prove sustainable in the long term, they will continue to accrue maintenance and delivery costs in the future as well as deliver further training and employment outcomes. These future costs and benefits have been given explicit treatment in this analysis by making assumptions about the range of future delivery costs and growth in demand for the skills infrastructure developed (as set out in sections 3 and 4).
- **Persistence of productivity impacts:** Productivity impacts are assumed to accrue in each year following the completion of training annually and persist on a lifetime basis<sup>12</sup>. However, a conservative approach has been adopted in which these benefit streams are cut off at the end of the appraisal window (10 years from beginning of delivery). This will depress estimates of return on investment in comparison to approaches that value for the full lifetime benefits of training.
- **Persistence of employment impacts:** Where investments are planning to support individuals into work through the provision of pre-employment training, the economic lifetime of jobs have been assumed to be three years<sup>13</sup>. While this assumption has been written into government guidance, this should be treated with some caution as it has not been empirically validated.

## 2.5 Deadweight

In order to reach estimates of the net costs and benefits associated with EIF and GIF infrastructure, it is important to consider how far the training and employment outcomes might have occurred in the absence of the investments involved (or deadweight).

Deadweight in this context can be thought of as comprising three elements:

- **Project additionality:** Investment projects may have proceeded in the absence of UKCES funding. As highlighted in section one, this issue has not been explicitly addressed in this *ex-ante* evaluation as the scope of this review did not incorporate collection of the types of qualitative insight that would be needed to make such an assessment (in effect, it has been assumed that all investments would not have proceeded in the absence of UKCES investment). While the benefits of those projects that would have proceeded in the absence of UKCES funding would have likely occurred anyway, this would also likely apply to the costs involved.

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<sup>12</sup> The duration of different types of training courses have been based on the results from the UKCES Employer Skills Survey and the Learner Survey sponsored by BIS.

<sup>13</sup> See recommended persistence rates set out in BIS, 2009 .

- **Deadweight associated with training outcomes:** Investments involve a range of activity designed to encourage employers to invest greater amounts in training or help them fill vacancies. Depending on the extent to which the investments involved made a material influence on the decisions of employers, the training and employment outcomes involved may have been achieved without the investment activity. However, for the purposes of this exercise, a range of assumptions over the extent of potential deadweight have been derived from the wider evaluation literature associated with comparable interventions (and these assumptions are set out in table 2.3 below).
- **Qualitative additionality:** Raising the quality of training through employer leadership is a central principle upon which the design of EIF and GIF was based. The assumptions set out in table 2.3 below will capture these effects to the extent that they are reflected in the greater demand for training. However, some employers may be encouraged to demand similar volumes of training at higher quality. The wider evaluation literature has focused primarily on establishing volume effects, and there is insufficient wider evidence through which an explicit treatment of qualitative additionality can be made.

The deadweight assumptions set out in table 2.3 also yield some insight into the potential effectiveness of different types of intervention. Evaluation evidence has suggested that a number of interventions are likely to be effective in raising demand for training, particularly those targeted at apprenticeships.

However, the limited quantitative evaluation evidence on the effectiveness of careers advice and guidance in stimulating demand for learning suggests that such interventions may be ineffective (although they may be effective in encouraging individuals to make different learning and career choices). Evidence gathered by UKCES in a 2009 economic appraisal of occupational licensing (analogous to the accreditation of training qualification) also suggested that the main effect of these types of intervention was to give a degree of market power to those holding such qualifications, resulting in an increase in prices without an increase in productivity (UKCES, 2009).

Nevertheless, the assumptions overleaf have not been based on a large numbers of studies (relating to the relative paucity of quantitative impact evaluations in these areas). The uncertainties involved are reflected in low and high assumptions for additionality. A more detailed discussion of the supporting evidence is provided in Appendix A.

**Table 2.3 Assumptions relating to the deadweight of training and employment outcomes**

Type	Range for deadweight <sup>14</sup>	Summary of evidence
Careers advice	98% to 100%	Estimate based on a single study finding no statistically significant impact of careers advice on take-up of learning.
Pre-employment support	30% to 45%	Based on a meta-review of evaluations (covering some 50 evaluations of employment brokerage and pre-employment support initiatives). Estimates largely based on self-reporting and potentially understate deadweight (BIS, 2009).
Employment brokerage	30% to 50%	
Training brokerage	40% to 75%	Based on a single review of the Train to Gain evaluation (BIS, 2012) . Low confidence in estimates of deadweight loss.
Skills diagnostic	40% to 75%	
Apprenticeship brokerage	55% to 80%	Combination of systematic quantitative research on the deadweight loss associated with apprenticeships with estimates set out above for training brokerage and skills diagnostics.
GTA	55% to 80%	
Employment of Apprentices	40% to 45%	Combination of systematic quantitative research on the deadweight loss associated with apprenticeships with evaluation finding associated with an NAS programme providing financial incentives for employers to take on apprentices.
Accreditation of training providers	60% to 100%	There is limited available evaluation evidence on the impacts of accreditation on training demand. However, US research into the impacts of formal occupational licensing suggests that this form of accreditation leads to wage gains without any increase in productivity (leading to social disbenefits). There is considerable uncertainty as to how these results might apply to the types of accreditation initiatives funded through the intervention (UKCES 2009) .
Accreditation of training courses	60% to 100%	
Creation of new qualifications	15% to 60%	In the absence of systematic evidence on the impact of new qualifications on training, broader estimates of the range of potential values for deadweight have been derived from a BIS meta-review of evaluations of interventions designed to support the development of education infrastructure (BIS 2009).
Networks	50% to 100%	There has been limited quantitative research into the net impacts of networks on training behaviour. These estimates are based on results from a US study that suggested that members of multiple networks were twice as likely as non-members to invest in training (suggestive of 50 percent deadweight) while membership of a single network led to no impact on training (suggesting complete deadweight).

## 2.6 Displacement, substitution, and multiplier effects

An assessment of additionality should also account for any displacement, substitution and multiplier effects associated with EIF and GIF investments. These issues describe for some of the wider (and potentially unintended) effects that might be expected to arise as a consequence of the outcomes achieved. For example, if beneficiary firms are able to gain an advantage over their competitors as a consequence of support provided, there may be corresponding loss of sales (and employment) amongst those competitors (i.e. a displacement effect). The following approaches used by the study for handling these effects in relation to training and employment outcomes are set out below.

### Training outcomes

The increased productivity associated with training outcomes have been modelled as an expansion in the productive capacity of the economy (i.e. as an increase in long-run aggregate supply). This has a range of implications for the treatment of displacement and multiplier effects:

<sup>14</sup> The percentage of training outcomes that would be delivered in the absence of UKCES funding.

- **Displacement:** An assumption of zero displacement has been applied. Firms that are able to increase their productivity may be able to reduce their prices allowing them to claim market share at the expense of competitors (and as a consequence, displacement may be high in the short run). However, it has been assumed that the reduction in prices driven both by initial productivity gains and by the release of human and capital resources will in the medium run stimulate an expansion in aggregate demand (completely offsetting initial displacement effects). To the extent that any short run displacement effects are significant, this assumption will result in an overstatement of net economic benefits.
- **Multiplier effects:** An assumption of zero multiplier effects has been applied. Training interventions may lead to a range of multiplier effects in the short run (such as the induced effects associated with increased wages and profitability)<sup>15</sup>. However, it is assumed that increases in aggregate demand will in the medium term lead to pressure on factor and product prices and depressing overall demand (offsetting the effects of any short term stimulus). This assumption will understate economic benefits in the short term (offsetting overstatement of impact as a consequence of assumptions made with respect to displacement).
- **Substitution effects:** No adjustment is made for substitution effects. EIF and GIF investments may lead to technological substitution (encouraging firms to undertake training investments in place of other productivity raising investments, such as new plant machinery). Estimates of productivity impacts at a firm level have been developed by the relative productivity of users and non-users of training, and it is assumed that these types of effect have to a large extent been taken into account in the estimates used.

## Employment outcomes

The following assumptions for displacement, substitution, and multiplier effects in the case of employment outcomes have been adopted:

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<sup>15</sup> Induced effects occur where increased wages lead to greater expenditure in the wider economy, leading to an increase in demand, and GVA and employment growth.

- Substitution and displacement:** Substitution effects will occur where individuals benefitting from EIF and GIF infrastructure fill vacancies at the expense of competing jobseekers, while displacement effects will occur if businesses are able to expand their revenues as a consequence of increased capacity, taking market share from domestic competitors. An international review of employment programmes undertaken by the DWP (DWP, 2011) suggests that estimates for substitution for supply side employment programmes (i.e. those targeted at raising the quality of labour supply) are inconclusive. In the short term, estimates of substitution effects suggested by econometric and survey based approaches tend to be low, while a general equilibrium modelling approaches yields high estimates. However, approaches based on general equilibrium modelling also suggest that any short run substitution would disappear within 10 years. This medium run effect is driven by an assumption that increased labour supply will put downward pressure on wages, leading to an offsetting increase in demand for labour amongst firms in the longer term. In line with DWP guidance, a lower bound for substitution of zero has been assumed, and an upper bound of 15 percent.
- Multiplier effects:** Following the recommendations made by the DWP (DWP, 2011), any multiplier effects associated with employment outcomes have been ignored. This guidance suggests that the main wider effect of employment and training programmes will be to stimulate growth in prices and wages, rather than leading to material increases in the wider output of the economy (in conditions of close to full resource utilisation in the wider economy).

## 2.7 Issues caused by data availability

This *ex-ante* assessment has been led by estimates of the volumes of training and employment outcomes agreed between UKCES and delivery partners. The agreement of monitoring indicators through early rounds of EIF and GIF has been undertaken on a case by case basis, and in some cases training outcomes were not incorporated as a monitoring indicator. As far as possible, it has been attempted to fill these gaps on the basis of wider secondary evidence or the expected performance of other similar investments funded. However, 23 investments did not provide sufficient information to be included within this analysis (accounting for £18m). These investments tended to be those with the most indirect relationship with employers and individuals (such as accreditation and creation of training qualifications), and those with a strong emphasis on network development.

## 2.8 Summary

- **Rationale:** The investments funded through the EIF and GIF programmes address a range of market failures that constrain employer investment in training. These include issues relating to potential loss of trained staff to competitors, the lack of market based incentives to provide public goods, an inability of employers to internalise the full benefits of infrastructure designed to deliver benefits at the level of a sector, and positive externalities associated with network growth and development.
- **Activities:** The investments funded are diverse in nature, ranging from interventions directly engaging employers and individuals through to those with more indirect effects (such as activities focused on developing new training products or accrediting training provision).
- **Training and employment outcomes:** Despite this diversity, the investments funded generally share the common goal of encouraging greater investment in training and supporting individuals into employment. Investments may lead to a wider range of intangible outcomes, but these have not been captured within the *ex-ante* assessment of impacts.
- **Productivity effects:** These outcomes can be expected to lead to a range of business benefits (such as reduced waste, improved worker efficiency, or reduced labour costs) that in aggregate will deliver economic benefits in the form of productivity growth (GVA per worker). These benefits have been estimated in the *ex-ante* evaluation in the form of enhanced wages for employees, greater profits for employers, and spill-over effects generated through knowledge transfer.
- **Deadweight:** Issues relating to project additionality (i.e. how far projects would have gone ahead in the absence of UKCES investment) have been considered out of scope in this study. An assessment of whether employers would have otherwise delivered the relevant training and employment outcomes in the absence of EIF and GIF infrastructure has been made on the basis of past evaluation evidence relating to similar interventions.
- **Treatment of displacement, substitution and multiplier effects:** The economic impacts of EIF and GIF have been largely been treated as an expansion in aggregate supply (taking a medium term perspective on the issues involved). As a result, any short run displacement and multiplier effects have been assumed to be offset in the medium term by adjustments in wages and the prices of goods and services, and have been ignored in this analysis.

- **Investments excluded:** A number of investments have been excluded from this *ex-ante* impact assessment. This includes 10 pure research projects that are not expected to directly lead to the types of tangible employment and training outcomes that form the core focus of the review. Six participation projects targeting women (the Women In Work programme) were funded through EIF1 and it was agreed over the course of the study that these investments would also be excluded (aligning with the approach taken in other parallel work). Additionally, a further 23 investments have been excluded as insufficient information on their expected outputs and outcomes was available.

## 3 Delivery Costs

This section provides an analysis of the delivery costs associated with EIF and GIF infrastructure investments made over the first two rounds of the programmes. This section describes the evidence available to support this assessment, sets out delivery costs anticipated at the point of appraisal, and develops a projection of future delivery costs that might be associated with the investments funded.

### 3.1 Evidence

Evidence on the delivery costs associated with EIF and GIF funding were compiled from the following sources:

- **Costing schedules:** As part of the application and appraisal process, costing schedules setting out the anticipated delivery costs associated with individual investments were developed by delivery partners and agreed with UKCES. These profiles provide a breakdown of anticipated delivery costs over the period for which UKCES funding was requested. Costing schedules break down anticipated sources of income, including cash and in-kind contributions from employers, and any income derived from fees associated with the products and services developed. It should be noted that these figures represent the costs that were agreed with delivery partners at the point of appraisal and selection: there may have been subsequent variations to contracts that are not reflected in the figures in this section.
- **Investment plans and application forms:** Some delivery partners provided future projections (i.e. beyond the lifetime of UKCES investment) of delivery costs within the investment plans agreed with UKCES and associated application forms (covering approximately 20 percent of investments). Where this information was available, it has been integrated into the *ex-ante* assessment.
- **Consultation with delivery partners:** Finally, consultations were undertaken with all delivery partners as part of the study to fill gaps in the evidence base (particularly with respect to future business plans). This exercise yielded a limited amount of additional information upon which future estimates of costs have been based.

### 3.2 UKCES funding for EIF and GIF

Table 3.1 provides an outline of the total UKCES funding committed to EIF and GIF investments under Rounds one and two of the programmes. In total, £90m was committed in funding to 88 investments between 2011/12 and 2014/15 (excluding the Women in Work interventions).

Of this, £13.4m was committed to 10 pure research projects which are excluded from this *ex-ante* evaluation for the reasons described in the preceding chapter. A further 23 investments were excluded (with a total value of £18m) as insufficient information was available on their expected training and employment outcomes to make a meaningful assessment of their economic benefits (this issue is explained in more depth in the following section).

This *ex-ante* assessment focuses on the remaining 55 investments, accounting for £58m of total funding committed (65 percent of the total committed under rounds one and two of EIF and GIF).

**Table 3.1 UKCES funding for EIF and GIF projects – Rounds one and two (£s, nominal prices)**

Funding	2011/12	2012/13	2013/14	2014/15	Total	Investments
Total UKCES funding	8,311,667	46,611,129	34,456,506	260,024	89,639,327	88
Pure research projects	920,303	7,827,577	4,661,311	0	13,409,191	10
Other excluded projects	1,972,587	8,976,061	6,970,197	50,724	17,969,569	23
<b>Included expenditure</b>	<b>5,418,777</b>	<b>29,807,492</b>	<b>22,824,998</b>	<b>209,300</b>	<b>58,260,567</b>	<b>55</b>

### 3.3 Delivery costs

Estimates of total delivery costs for this sub-set of investments are set out in table 3.2 (alongside associated income sources). In addition to UKCES funding, delivery partners had committed **£48m** in leverage from the private sector (covering both in-kind and cash contributions, with this latter category also including any income derived from fees). For the pool of investments under consideration in this study, this represents a leverage ratio (in terms of delivery costs) of £0.82 per £1 of UKCES expenditure<sup>16</sup>.

Leverage is projected to increase over time, largely driven by increases in cash contributions from employers, to represent 75 percent of overall delivery costs in 2014/15. This suggests that across the programme, plans have been developed to move projects towards financial stability in later years, ideally facilitating the on-going sustainability of the investments.

No investments had been funded on the basis that they would generate surpluses over the period in which UKCES was providing funding. Total anticipated delivery costs over the 2011/12 to 2014/15 period have been estimated at **£107m**.

<sup>16</sup> This figure refers only to the subset of EIF and GIF projects that were covered by the study and will not be consistent with estimates of leverage that relate to the full range of projects supported.

**Table 3.2 Total delivery costs over the lifetime of UKCES funding (£s, nominal prices)**

Income source	2011/12	2012/13	2013/14	2014/15	Total
UKCES Funding	5,418,777	29,807,492	22,824,998	209,300	58,260,567
Employer in-kind	2,744,450	13,243,266	12,803,221	400,000	29,190,937
Employer cash contributions	288,902	5,321,581	13,252,252	198,500	19,061,235
<b>Total delivery costs</b>	<b>8,452,129</b>	<b>48,372,339</b>	<b>48,880,471</b>	<b>807,800</b>	<b>106,512,739</b>

### 3.4 Future delivery costs

If EIF and GIF investments are to be sustained in the long term, then maintenance of the infrastructure will involve further resource costs. There was limited evidence available on the potential future delivery costs associated with EIF and GIF investments, with few delivery partners putting in place long term business planning arrangements (with anecdotal evidence suggesting that some delivery partners were waiting for the outcome of self-funded ex-post evaluation results before making decisions on whether to take infrastructure forward beyond the lifetime of UKCES funding).

In order to provide a long term estimate of the potential impacts of EIF and GIF investments on a consistent basis, it has been assumed that all investments will endure over a 10 year period at a similar scale as at the point at which UKCES funding came to an end. Future delivery costs were estimated by applying the assumptions set out in table 3.3 below to annual delivery costs in the final year of UKCES funding.

**Table 3.3 Assumptions underlying projected future delivery costs**

Activity types	Delivery costs as a percentage of final annual delivery costs	Rationale
Pre-employment support, skills diagnostic, employment of apprentices, training brokerage, apprentice brokerage, employment brokerage, GTAs and Networks.	80% to 120%	The maintenance of these types of project will likely require on-going staffing in order to continue delivering support to employers. As such, it is expected that similar costs would be required in the future order to maintain activity at comparable levels (i.e. at 100 percent of final year delivery costs). However, given the uncertainties involved, some allowance for growth or decay has been made (leading to a range of 80 to 120 percent of final year delivery costs). This upper range might be thought of as to include a degree of optimism bias around the likely level of resourcing required to maintain delivery.
Careers advice, creation of new qualifications, accreditation of qualifications, and accreditation of training providers	20% to 80%	These projects typically involve substantial development costs but do not require such significant maintenance costs as they do not involve the same level of direct engagement with employers (and a central scenario that these projects might require 50 percent of final year delivery in the longer term for on-going maintenance). There is greater uncertainty over the nature of these future costs and this is reflected in the wider range for final year delivery costs. Again, the upper end of the range might be thought of as included a degree of optimism bias associated with the future resourcing requirements of these types of initiative.

Estimates of the total potential future delivery costs beyond the lifetime of UKCES funding are set out in table 3.4 below. It is estimated that **between £254m and £450m** would be needed to maintain the relevant EIF and GIF infrastructure projects for another seven years 2014/15 to 2021/22.

**Table 3.4 Total future delivery beyond the lifetime of UKCES investment costs (2014/15 to 2021/22, £s, nominal prices)**

Future delivery costs	2014/15 to 2021/22
Low estimate	253,646,878
High estimate	450,061,250

### 3.5 Total delivery costs

Estimates of total delivery costs are set out in the table below in nominal terms, at 2011/12 prices (i.e. adjusting for expected inflation), and in present value terms (with a baseline of 2011/12 for all investments). The estimated present value of delivery costs associated with relevant EIF and GIF investments (at 2011/12 prices) over the lifetime of UKCES funding is estimated at **£99m**. Contingent on investment activity being sustained for a full ten year period, this rises to between **£295m and £447m**. If these costs are funded by the private sector, this implies that the leverage on UKCES investment may rise substantially (to up to £7 per £1 of UKCES spending).

The costs of the EIF and GIF programmes have also been separated in the table below. EIF is estimated to account for the majority of total expenditure under the two programmes (£179m to £284m over ten years), with investments funded via GIF accounting for between £117m to £162m over the same period).

**Table 3.5 Total delivery costs, £ms**

Future delivery costs	2011/12 to 2014/15	2014/15 to 2021/22	Total
Total delivery costs (nominal prices)	107	254 – 450	361 - 557
Total delivery costs (2011/12 prices)	104	244 – 432	348 - 536
<b>Present value of delivery costs</b>	<b>99</b>	<b>196 – 348</b>	<b>295 - 447</b>
<i>EIF</i>	68	111 – 217	179 - 284
<i>GIF</i>	31	86 – 131	117 – 162

### 3.6 Comparison with other skills investment

The overall level of UKCES spending is modest in comparison to other public investments in the skills system. For example, over £340m of public sector spending has been allocated to the parallel Employer Ownership Pilot programme (2012 – 2016) for funding of participation initiatives, while close to £500m is spent on adult apprenticeships annually<sup>17</sup>.

There were substantial differences in the leverage ratios achieved by the EIF and GIF programmes, with EIF delivering £0.52 per £1 of UKCES spending, and GIF delivering £1.68 per £1 of UKCES spending.

This is broadly in line with comparable programmes. For example, round one of the Employer Ownership Pilot achieved an overall leverage ratio of £1.46<sup>18</sup>.

Additionally, expected leverage ratios are much higher if EIF and GIF infrastructure can be sustained by private expenditure in the future (up to £7 per £1 spent), suggesting the programme has the potential to be highly effective in this regard. Nevertheless, as achievement of these ratios is contingent on the sustainability and success of infrastructure, they are substantially more uncertain than those associated with the Employer Ownership Pilot.

### 3.7 Summary of Delivery Costs

- **UKCES spending:** A total of £90m was committed to the 88 investments funded through EIF and GIF (excluding Women in Work investments). A number of investments have been excluded from the analysis due to their nature (i.e. pure research projects) or a lack of data availability. This *ex-ante* analysis focuses on 55 investments accounting for £58m of UKCES spending (65 percent of the total).
- **Employer contributions:** The 55 investments under consideration involved delivery costs, over the duration over which UKCES funding is provided, of **£107m**, with **£48m** expected to be provided in the form of in-kind or cash contributions from employers. This equates to a leverage ratio of £0.82 per £1 of UKCES spending<sup>19</sup>.

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<sup>17</sup> The Employer Ownership of Skills pilot is a competitive fund open to employers to invest in their current and future workforce in England. Round one projects were announced in September 2012 and round two launched in November 2012. For information: [www.ukces.org.uk/ourwork/investment/employer-ownership](http://www.ukces.org.uk/ourwork/investment/employer-ownership).

<sup>18</sup> Calculated from press releases associated with the programme (see: <http://www.ukces.org.uk/news/Press-releases/2012/Sep/165m-skills-boost-from-employer-ownership-pilot>). Round one applicants were not asked to separate cash and in kind investment whereas round two applicants were.

<sup>19</sup> This figure refers only to the subset of EIF and GIF projects that were covered by the study and will not be consistent with estimates of leverage that relate to the full range of projects supported.

- **Future delivery costs:** EIF and GIF emphasised the sustainable nature of skills infrastructure investment activity. If investment activity is to be sustained into the future, then there will be further maintenance costs associated with the delivery of infrastructure projects. Using a range of assumptions relating to the potential future costs involved (building in considerations around possible optimism bias) the total cost of delivery over the remainder of the 10 year period under consideration could have a value of between **£254m and £450m**.
- **Total costs:** The present value of long term delivery costs is estimated at between **£295m and £447m** (in 2011/12 prices). While the UKCES contribution to the overall programme is significant in absolute terms, it is relatively modest in relation to other comparable initiatives (such as the £340m committed to the Employer Ownership Pilot (2012 -2016), or the £0.5bn spent on adult apprenticeships annually). However, once future costs are accounted for, the scale of activity is relatively substantial, and (to the extent these costs are funded from the private sector) the leverage ratio may rise to up to £7 per £1 spend.
- **Benchmarking:** Leverage ratios are broadly in line with comparable initiatives.). GIF investments generated substantially higher rates of leverage (at £1.68 per £1 of spending) than EIF investments (£0.52 per £1 spending). However, EIF and GIF could substantially outperform participation programmes if delivery of the infrastructure involved can be sustained.

## 4 Training Outcomes and Costs

This section provides an analysis of the expected training and employment outcomes associated with EIF and GIF investments funded over the first two rounds. This analysis incorporates an assessment of the extent to which those outcomes may have occurred (or will occur) in the absence of UKCES funding. The delivery of training outcomes is also likely to involve a cost, and this section also incorporates estimates of the expenditures associated with delivering those training outcomes to both the wider public sector and employers involved.

### 4.1 Evidence

Evidence on the training and employment outcomes of EIF and GIF investments were compiled from a range of sources:

- **Investment plans and application forms:** The main source of evidence on the training and employment outcomes of EIF and GIF investments was the performance indicators set out in the investment plans agreed between UKCES and delivery partners at the point of appraisal. These plans (and associated application documentation) commonly include forward projections of the training and employment outcomes involved. However, details on the level or type of training are often limited, owing to the light touch nature of approach taken to monitoring. Additionally, owing to the case by case approach to agreeing monitoring indicators with delivery partners, some investments did not agree indicators reflecting the delivery of training and employment outcomes.
- **Consultation with delivery partners:** Delivery partners were consulted as part of this exercise in order to fill gaps around the training and employment outcomes involved and forward projections. This provided substantial additional information on the nature of the training and employment outcomes expected from EIF and GIF investments. However, it was not possible to fill all gaps through this process, and as far as feasible, it has been attempted to address these issues by developing assumptions on the basis of projected performance of other investments within the portfolio delivering similar activities.

### 4.2 Assumptions

A range of assumptions on the nature of the training outcomes associated with different types of activities were applied in this study (as set out in Table 2.2).

Where no information was available on these outcomes in investment plans or other project documentation, an attempt was made to estimate potential outcomes on the basis of the outputs delivered by investments. For example, where delivery partners had only agreed indicators relating to the numbers of firms benefitting from skills diagnostic interventions, training outcomes were estimated on the basis of the expected number of workers receiving training per employer engaged reported by other investments delivering similar activity<sup>20</sup>. The key assumptions made were:

- **Skills diagnostics:** Where information on training outcomes was unavailable, an assumption that 7.66 employees would receive training per firm engaged based on the expected performance of other similar investments.
- **Training brokerage:** Where information on training outcomes was unavailable, an assumption that 1.68 employees would receive training per firm using the mechanism (based on the performance of other similar investments).

### 4.3 Total training and employment outcomes

Estimates of the total volume of training outcomes set out in project documentation (including evidence gathered through the consultation exercise) are set out in table 4.1 below.

In volume terms, the main focus of investments is to raise levels of general on and off-the-job training (with 29 of 55 investments expected to lead to these types of training outcomes). However, a significant number of apprenticeships and other vocational qualifications are expected (generally at higher levels).

There was a substantial difference in how far future projections of non-accredited training outcomes were provided by delivery partners (that might be delivered through training brokerage or skills diagnostic activities) than the general learning outcomes projected for careers advice activities. This is largely due to an absence of future projections of demand for the latter type of activities, rather than any fundamental differences in the anticipated sustainability of the two types of activity<sup>21</sup>.

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<sup>20</sup> As highlighted in the previous sections, 23 investments were excluded from the analysis as either they did not provide the required information on expected outputs to make this feasible, or that there was insufficient evidence from the wider portfolio to support the development of appropriate assumptions.

<sup>21</sup> For further discussion of the sustainability of investments see Qualitative Evaluation of Demand-led Skills Solutions: Growth and Innovation Funder and Employer Investment Fund, UKCES, 2013 and Planning for Sustainability: Thematic Paper, UKCES, 2013. Available: [www.ukces.org.uk/publications/er78-qualitative-evaluation-of-demand-led-skills](http://www.ukces.org.uk/publications/er78-qualitative-evaluation-of-demand-led-skills)

**Table 4.1 Expected volumes of training and employment outcomes set out in project documentation**

Type of training	Training and employment outcomes set out in project documentation alone			Including outcomes estimated on the basis of expected outputs		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Non accredited training	222,420	128,316	350,736	253,376	135,362	388,738
<b>Apprenticeships</b>						
Intermediate	135	0	135	135	0	135
Advanced and Higher	3,606	4,658	8,265	3,606	4,658	8,265
Unknown level	6,363	3,093	9,456	6,363	3,093	9,456
<b>Other vocational training</b>						
Level 2	720	37,578	38,298	720	37,578	38,298
Level 3	0	58,484	58,484	0	58,484	58,484
Level 4	1,350	7,339	8,689	1,350	7,339	8,689
<b>General</b>						
General learning outcomes	60,400	400	60,800	119,316	4,722	124,038
<b>Employment outcomes</b>						
Vacancies filled	1,860	417	2,277	1,860	417	2,277
<i>Total training episodes</i>	<i>294,994</i>	<i>239,868</i>	<i>534,863</i>	<i>384,866</i>	<i>251,236</i>	<i>636,103</i>

Whilst a relatively high number of investments provided forward projections for the volumes of training and employment outcomes expected in the future, these projections were not made over consistent time period (some related to 3 years, some to 5 years, etc).

In line with the assumptions set out in the previous chapter, additional projections of the future training outcomes of EIF and GIF investments have been made on the basis that the volumes of outcomes delivered will remain at comparable levels (between 80 and 120 percent depending on activity type, as set out in table 3.3) to the final year for which delivery partner expectations were available (all future estimates provided by applicants were retained in the analysis).

Estimates including these additional future projections are provided in table 4.2 below. Application of these assumptions has significant upward effect on the training and employment outcomes expected in the period after UKCES funding comes to an end. The volume of apprenticeships delivered over the 10 year period is expected to rise to between around **50,000 and 70,000**, with delivery of between **125,000 and 135,000** episodes of other vocational training. Additionally, delivery of between **1.5m and 2.0m** episodes of non-accredited training is expected. The bulk of training episodes were expected to be delivered by investments funded through the EIF programme.

**Table 4.2 Projected volumes of training outcomes based on assumptions adopted**

Type of training	Outcomes are delivered at 80 percent of final year volumes			Outcomes are delivered at 120 percent of final year volumes		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Non accredited training	318,104	1,149,730	1,467,834	350,517	1,656,929	2,007,446
<b>Apprenticeships</b>						
Intermediate	186	307	493	212	460	672
Advanced and Higher	3,606	13,370	16,976	3606	17,726	21,332
Unknown level	6,780	28,871	35,651	6989	41,759	48,748
<b>Other vocational training</b>						
Level 2	1,296	41,610	42,906	1584	46,189	47,773
Level 3	0	64,045	64,045	0	66,826	66,826
Level 4	1350	17,797	19,147	1350	23,027	24,377
<b>General</b>						
General learning outcomes	175,779	371,236	547,015	204,262	554,743	759,005
<b>Employment outcomes</b>						
Vacancies filled	2,220	5,621	7,841	2,400	8,223	10,623
<i>Total training outcomes</i>	<i>507,101</i>	<i>1,686,966</i>	<i>2,194,067</i>	<i>568,520</i>	<i>2,407,659</i>	<i>2,976,179</i>
<i>EIF</i>			<i>1,729,695</i>			<i>2,392,822</i>
<i>GIF</i>			<i>464,373</i>			<i>583,359</i>

#### 4.4 Gross additional training and employment outcomes

The deadweight and displacement assumptions set out in section 2 were applied to these projections to reach an estimate of the volume of training and employment outcomes that would not have occurred in the absence of UKCES investment. These assumptions were applied to the training and employment outcomes anticipated from the range of activities delivered by each investment. Results have been aggregated in table 4.3 below (with more detailed results set out by type of activity in Appendix A).

- A projected total of between **340,000 and 1.3m** additional episodes of training are expected as a consequence of EIF and GIF infrastructure projects over their lifetime. The bulk of these episodes are expected in the form of non-accredited training and general off-the-job training. The EIF programme is expected to deliver a high share of these outcomes (between 78 percent and 82 percent depending on the assumptions employed).
- The wide variation is driven by uncertainties associated with levels of deadweight with particular categories of intervention (and in particular, large uncertainties associated with the likely effectiveness of accreditation activities and careers advice and guidance).
- Nevertheless, the volumes of additional formal vocational training expected are substantial. Between **17,000 and 38,000** additional apprenticeships are expected (mainly at advanced and higher levels), alongside between **20,000 and 74,000** episodes of other vocational training.

- Between **3,500 and 7,400** vacancies are expected to be filled through pre-employment training and employment brokerage activities.
- The bulk of training episodes are expected between 2015/16 and 2021/22, suggesting that **a large share of the potential impact is contingent on the on-going sustainability of investments concerned.**

**Table 4.3 Projections of gross additional training outcomes**

Type of training	Low additionality of training outcomes and low future projected activity (80% of final year outcomes)			High additionality of training outcomes and high future projected activity (120% of final year outcomes)		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Non accredited training	70,722	235,245	305,967	209,356	964,418	1,173,775
<b>Apprenticeships</b>						
Intermediate	74	123	197	116	253	369
Advanced and Higher	1,335	4,548	5,882	1,930	9,279	11,208
Unknown level	2,097	8,467	10,563	3,933	22,965	26,897
<b>Other vocational training</b>						
Level 2	606	1,885	2,491	1,109	20,290	21,399
Level 3	0	9,913	9,913	0	33,926	33,926
Level 4	504	6,835	7,339	1,107	17,208	18,315
<b>General</b>						
General learning outcomes	0	0	0	4,085	11,095	15,180
<b>Employment outcomes</b>						
Vacancies filled	999	2,510	3,509	1,680	5,756	7,436
<i>Total training</i>	<i>75,338</i>	<i>267,016</i>	<i>342,352</i>	<i>221,636</i>	<i>1,079,434</i>	<i>1,301,069</i>
<i>EIF</i>			<i>279,906</i>			<i>1,009,693</i>
<i>GIF</i>			<i>62,447</i>			<i>291,377</i>

#### 4.5 Costs of delivering training outcomes

As set out in section 2, the delivery of these training outcomes will lead to further expenditure by both employers and the wider public sector (in the form of both financial investment and opportunity costs)<sup>22</sup>. Assumptions on the unit annual cost and duration of different types of training were derived from a range of secondary sources. These estimates are based on survey based averages: if the training outcomes involved tend to be either shorter or longer than average, then there will be a corresponding over- or under-statement of the value of the indirect costs of training. Table 4.4 below sets out these assumptions:

<sup>22</sup> It is assumed that the filling of vacancies will involve no additional costs or investment on the part of employers.

**Table 4.4 Unit annual costs and duration of training**

Type of training	Employer expenditure on training (£s)	Indirect costs to the wider public sector (£s)	Duration (years)
<b>General training</b>			
Non-accredited training	£ 3,409	n.a.	n.a
<b>Vocational qualifications</b>			
Level 1	£ 1,203	£ 1,795	0.5
Level 2	£ 1,786	£ 3,926	1.5
Level 3	£ 1,118	£ 7,040	2.5
Level 4	£ 7,565	£ 4,096	1.5
<b>Apprenticeships</b>			
All apprenticeships	£4,816	£ 3,491	1 (level 2) 2 (Levels 3 & 4)

These assumptions were then weighted on a sector basis using evidence relating to relative cost of providing training in different industries taken from the UKCES Employer Skills Survey and from wider research commissioned by BIS.

Estimates of the total induced expenditure associated with additional training outcomes are set out in table 4.5 below. Total indirect costs over a ten year period are estimated at between **£1.8bn and £5.1bn**, with the bulk of these representing employer expenditure on training. Increased employer investment in skills is estimated at between **£130m and £430m** per annum (to put these estimates in context, the Employer Skills Survey 2011 suggests that employers invest £49bn in training per annum, so these estimates represent less than one percent of firms' overall training budgets)<sup>23</sup>.

The additional cost to the wider public sector associated with EIF and GIF investments are estimated at between **£458m to £771m** over the 10 year period (between £45m and £77m per annum). Again, these costs are relatively inconsequential in comparison to the overall public sector budget for adult skills provision (with for example, the costs associated with the delivery of adult apprenticeships alone estimated by the National Audit Office at £500m per annum).

In line with the greater expected role of EIF in delivering additional training outcomes, the indirect costs associated with the programme are also expected to be substantially greater those associated with GIF.

<sup>23</sup> Indirect costs have been in part estimated on the basis of unit values from the Employer Skills Surveys, so to a large degree these findings are directly comparable. However, there may be additional costs associated with the delivery of apprentices (where the indirect costs have been estimated from alternative sources) that are not captured in these estimates.

**Table 4.5 Present value of indirect costs associated with EIF and GIF investments, £ms (2011/12 prices)**

Indirect costs	2011/12 to 2014/15	2015/16 to 2021/22	Total
Indirect costs to employers	348 - 921	972 - 3417	1,320 – 4,339
Indirect costs to the wider public sector	85 - 137	373 - 634	458 - 771
<b>Total</b>	<b>433 - 1058</b>	<b>1,345 – 4,051</b>	<b>1,778 – 5,110</b>
<i>EIF</i>	-	-	1136 - 3479
<i>GIF</i>	-	-	641 - 1631

#### 4.6 Total costs associated with EIF and GIF investments

The table below provides estimates of the present value of total costs associated with EIF and GIF investment activity (integrating estimates of delivery costs set out in the preceding chapter). Overall, the present value of net costs associated with EIF and GIF investments (in 2011/12 prices) is estimated at between **£2.1bn and £5.6bn** over 10 years. Between 60 and 70 percent of these costs are accounted for by increased expenditure on training by employers (including foregone productivity associated with releasing workers for training). Delivery costs represent a relatively small share of total costs (between 10 and 15 percent). The bulk of total costs are expected to follow as a consequence of activity funded through the EIF programme.

**Table 4.6 Present value of total costs associated with EIF and GIF investments, £ms (2011/12 prices)**

Costs	2011/12 to 2014/15	2015/16 to 2021/22	Total
Delivery costs	99	196 - 348	295 - 447
Indirect costs to employers	348 - 921	972 - 3417	1320 - 4339
Indirect costs to public sector	85 - 137	373 - 634	458 - 771
<b>Total</b>	<b>532 – 1,157</b>	<b>1,541 – 4,399</b>	<b>2,073 – 5,557</b>
<i>EIF</i>	-	-	1,315 – 3,764
<i>GIF</i>	-	-	758 – 1,793

#### 4.7 Cost effectiveness

Given the diversity of the training outcomes delivered by EIF and GIF programmes (and aggregate nature of the information on costs available), it is difficult to provide precise efficiency measures for the programmes in terms of cost per training outcome. However, taking together the total costs and training outcomes involved, some broad cost-effectiveness metrics can be developed:

- **Overall cost per training outcome:** EIF and GIF are expected to deliver between **340,000 and 1.3m** additional training episodes at an overall cost to society of between **£2.1bn and £5.6bn**. This implies a potential range of the cost of training outcomes of between **£4,300 and £6,100** (broadly in line with the values set out in table 4.4, as expected). However, this is not an appropriate measure of efficiency or the effectiveness of the programme, given that the programme is designed to stimulate the expenditure involved.
- **Delivery cost of training outcomes:** The costs of delivering EIF and GIF infrastructure is estimated at between **£295m and £447m**. This equates to a unit delivery cost of additional training outcomes of between **£340 and £860**.
- **Cost to UKCES of training outcomes:** The estimated unit cost to UKCES of additional training outcomes is estimated at between **£40 and £160**.

There are relatively limited cost-effectiveness benchmarks available for comparable skills infrastructure projects. A 2009 National Audit Office review of the Train to Gain skills brokerage programme found a cost per (gross) learner of £970 (which excludes any costs incurred by the wider public sector in the delivery of those outcomes), and concluded that the service did not offer good value for money.

In this context, the EIF and GIF programmes may substantially outperform the Train to Gain service (as the gross cost per learner is between £111 and £149<sup>24</sup>), although lower unit costs will only be obtained if investments prove sustainable in the longer term. It should also be noted that the Train to Gain service also provided public funding for the training of eligible employees (which will have inflated the gross cost per learner).

The focus of EIF and GIF on raising employer investment in training (and on the basis that they prove as effective as projected) may have helped drive this apparently more efficient use of public money to raise investment in training.

#### **4.8 Variability across investments**

There was substantial variability in the unit cost per training outcome across the portfolio of investments funded through the EIF and GIF programmes. The delivery cost per additional training episode (at an investment level) was estimated to range from £13 through to £32,600. These extreme values may reflect both unrealistic planning assumptions about likely levels of take up (at the lower end) or a primary focus on helping individuals into work (at the upper end).

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<sup>24</sup> i.e. based on the gross training and employment outcomes set out in table 4.1.

The EIF programme (on average) delivered training episodes more efficiently (at a unit cost of between £280 and £630) than those funded through GIF (a unit cost of between £550 and £1,910). However, these comparisons will be influenced by any differences in the quality of outcomes delivered by the two programmes.

#### 4.9 Optimism bias and risk

As stressed above, while costs per training outcome measures are comparatively strong, they are contingent on the assumption that EIF and GIF infrastructure projects both deliver their anticipated levels of training outcomes and are sustained over the longer term. This section considers issues relating to optimism bias and the risk of investments failing to prove sustainable:

- **Under-performance:** An analysis of monitoring information relating to EIF and GIF (at May 2013) suggests across the portfolio of investments (and all monitoring indicators) that the programme is largely on track (and even exceeding targets) in terms of the delivery of training and employment outcomes. However, the level of engagement with employers (i.e. number of employer beneficiaries) lags behind targets (with just 40 percent of the target achieved by May 2013). On the basis of this evidence, it does not suggest that there have been substantial levels of optimism bias (i.e. overly optimistic projections of the levels of training outcomes at the point of appraisal) built into forecast volumes of training outcomes delivered. This suggests that forecast levels of performance in the long run may well be achievable if investments prove sustainable).

**Table 4.7 Delivery of engagement, training and employment outcomes (May 2013)**

Outcome	Actual	Planned	Variance (%)
Employer Beneficiaries	6,234	15,297	41
Apprenticeship Starts	15,019	10,627	141
Training (non-Apprenticeship)	107,995	44,736	241
Employment Outcome	1,577	1,499	105

- **Impact of failure:** If investment activity is not sustained beyond the lifetime of UKCES investment, the volume of expected additional training outcomes is expected to fall to between **75,000 and 220,000**. At the same time, delivery costs would be expected to fall to **£99m**, leading to an increase in the unit costs of training episodes to between **£450 and £1,300** (with the range much closer to that delivered by Train to Gain and judged poor value for money by the National Audit Office). The cost per training outcome to UKCES would similarly rise to between **£250 and £740**.

## 4.10 Summary

- **Training outcomes expected by delivery partners:** The volumes of training outcomes expected by EIF and GIF investments are significant. Project documentation suggested that over **0.5m** individuals may receive some form of on-the-job or formal vocational training over the 10 years under consideration. There are also expectations of substantial numbers of apprenticeships being delivered through the programme (mainly at higher levels). Applying assumptions relating to the on-going sustainability of investments raises these estimates further still.
- **Indirect costs and expenditure:** The indirect costs and induced investment associated with delivering this volume of training outcomes are also potentially significant. Estimates suggests that over 10 years, employers could raise their expenditure on training by between **£1.3bn and £4.3bn** in (including foregone productivity), while the public sector might expect to incur **£460m and £770m** through the costs of providing of formal vocational learning to employees.
- **Total costs:** Taking indirect costs into account, total lifetime costs associated with EIF and GIF investments are estimated at between **£2.1bn and £5.6bn**. The bulk of these costs represent increased employer investment in training, with delivery costs accounting for between 10 and 15 percent of the overall total.
- **Cost per training outcome:** Combining estimates of total gross additional costs and training outcomes, the overall expected cost per training outcome is between **£4,300 and £6,100**. In terms of the cost effectiveness of infrastructure projects, the infrastructure delivery cost per additional training outcome is estimated to be between **£340 and £860**. These estimates will overstate unit prices as the costs involved as they incorporate the resources absorbed by activities delivering employment outcomes (which cannot be separated from the costs of delivering other types of activity). Finally, training outcomes are expected to be delivered at a unit cost to UKCES of between **£40 and £160** over the potential lifetime of projects.
- **EIF and GIF:** EIF investments are expected to deliver the majority of the training episodes expected (around 80 percent) and at a lower unit delivery cost than those investments funded through the GIF programmes. However, these estimates do not account for variations in the quality of the training outcomes delivered.

- **Benchmarking:** There are relatively limited cost-effectiveness benchmarks available for comparable skills infrastructure projects. A 2009 National Audit Office review of the Train to Gain skills brokerage programme found a cost per (gross) learner of £970, and concluded that the service did not offer good value for money. In this context, the EIF and GIF programmes may substantially outperform the Train to Gain service (with gross costs per training episode of less than £200), although lower unit costs will only be obtained if investments prove sustainable in the longer term.

## 5 Impacts of EIF and GIF

This section sets out the anticipated economic and social benefits associated with EIF and GIF investments (rounds one and two). It outlines the assumptions that have been made to generate estimates of the potential productivity and other impacts of EIF and GIF training infrastructure, before setting out the estimated value of the net training outcomes that are described in the previous chapter.

### 5.1 Assumptions

As set out in section 2, estimates of monetary value of training and employment outcomes have been made on the basis of assumptions derived from the labour economics literature examining the economic returns to training. The wage premia (the uplift on wages expected from training) assumed for different types of qualification are set out in table 5.1.

Estimates of wage benefits are generated by applying these wage premia to median earnings and have then been indexed to the relative productivity of different industries to reflect the relative differences in value added at an industry level (except in the case of apprenticeships where sector level estimates of relative wage premia were not available).

As described estimates of wage impacts were used to drive estimates of firm level productivity gains (100 percent of the initial wage impact<sup>25</sup>), and industry level spill-over effects (also 100 percent of the initial wage impact).

The GVA impacts associated with net employment outcomes were estimated on the basis of GVA per worker at an industry level derived from ONS Blue Book (ONS, 2013a). GVA impacts have been apportioned between wages and profits on the basis of the results of the ONS Annual Business Survey (ONS, 2013b).

**Table 5.1 Wage premia assumptions**

Type of training	Wage premia (% per annum)
<b>General training</b>	
Non-accredited training	2.2%
General learning outcomes	Average of all training types
<b>Vocational qualifications</b>	
Level 1	7.4%
Level 2	8.5%
Level 3	10.5%
Level 4	10.0%

<sup>25</sup> Except in the case of apprenticeships where firm level productivity benefits were assumed to be 25 percent of overall wage gains, following the National Audit Office study (NAO, 2012, reflecting wider research that shows limited firm level impacts on productivity in the short term).

Type of training	Wage premia (% per annum)
<b>Apprenticeships</b>	
Intermediate	8.9%
Advanced and above	19.0%
Unknown level	Average of the above
<b>Employment Outcomes</b>	
All	50 percent of GVA per worker

## 5.2 Wage Benefits

Estimates of the value of potential wage gains associated with the additional training and employment outcomes (as set out in table 4.3) projected for EIF and GIF investments are set out in table 5.2 below. Over the potential lifetime of investments, employees are expected to see net wage gains of between **£1.3bn and £4.1bn**.

The large majority of these wage gains will occur outside of the period of UKCES funding (around 90 percent across the two scenarios). This is both driven by the way in which wage gains are assumed to accrue (i.e. on an annual basis over the 10 year appraisal window) and the high volumes of training outcomes anticipated over the lifetime of the programme.

**Table 5.2 Projections of net wage gains (£ms)**

Type of training	Low additionality of training outcomes and low future projected activity (80% of final year outcomes)			High additionality of training outcomes and high future projected activity (120% of final year outcomes)		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Present value of wage gains	115	1232	1,347	279	3,824	4,104

## 5.3 Firm Level Benefits

Estimates of the value of related firm level productivity gains are set out in table 5.3 below. Productivity gains accruing to employers for the ten year lifetime of investments are estimated at between **£1.0bn and £3.2bn**. This includes the profits associated with any additional output firms are able to produce as a consequence of filling vacancies

**Table 5.3 Projections of net profitability gains (£ms)**

Type of training	Low additionality of training outcomes and low future projected activity (80% of final year outcomes)			High additionality of training outcomes and high future projected activity (120% of final year outcomes)		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Present value of profitability gains	99	870	969	251	2,978	3,229

## 5.4 Spill-over Effects

Finally, estimates of the value of spill-over effects (positive externalities driven by the diffusion of skills through peer based learning and poaching of staff) are set out in table 5.4 below. The value of projected spill-over effects is estimated at between **£0.7bn and £2.6bn**. No spill-over effects have been applied to wage and profit gains associated with the expected vacancies filled through the investment portfolio.

**Table 5.4 Projections of spill-over effects (£ms)**

Type of training	Low additionality of training outcomes and low future projected activity (80% of final year outcomes)			High additionality of training outcomes and high future projected activity (120% of final year outcomes)		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Present value of spill-over effects	57	649	706	175	2,449	2,625

## 5.5 Total productivity gains

Estimates of the potential range for total productivity gains are set out in table 5.5 below. The overall lifetime present value of the economic impacts of EIF and GIF investments is estimated at between **£3.0bn and £10.0bn**.

As suggested above, a high proportion of the expected benefits of EIF and GIF investments are expected in the period 2015/16 and 2021/22. This period is outside of the time with which UKCES will have contracts with delivery partners, and is suggestive of some potential risks, particularly as the delivery of the associated training outcomes may be difficult to monitor. Additionally, the majority of productivity benefits are expected to be delivered by the EIF programme.

**Table 5.5 Projections of total productivity gains (£ms, present value at 2011/12)**

Type of training	2011/12 to 2014/15	2015/16 to 2021/22	Total
Wage gains	115 – 279	1,232 – 3,824	1,347 – 4,104
Profitability gains	99 – 251	870 – 2,978	969 – 3,229
Spill-over effects	57 – 175	649 – 2,449	706 – 2,625
<b>Total</b>	<b>271 – 705</b>	<b>2,751 – 9,251</b>	<b>3,022 – 9,958</b>
<i>EIF</i>	-	-	2,366 – 7,702
<i>GIF</i>	-	-	657 – 2,255

## 5.6 Summary of impacts<sup>26</sup>

- **Value of productivity gains:** The total present value of net economic productivity gains are estimated at between **£3.0bn and £10.0bn** (with approximately even contributions from wage gains, profitability gains, and spill-over effects). EIF investments are expected to deliver around 75 percent of these benefits (£2.4bn to £7.7bn), with GIF contributing an estimated £657m to £2.3bn.

<sup>26</sup> An indicative assessment of health impacts is provided in Appendix C.

- **Time profile:** Productivity gains are skewed towards the later years of the 10 year time period under consideration, with around **90 percent of impacts expected to occur within the 2015/16 to 2021/22 period** after UKCES funding has come to an end. This is driven by a range of factors. Firstly, wage gains accrue on an annual basis, so impacts in later years will incorporate the benefits of training outcomes delivered within the period of funding. However, the scale of productivity gains are also contingent on the delivery of outcomes outside the funding period (and a number of investments were not planning to launch to market until close to the point at which UKCES funding came to an end). As a result, a substantial share of the expected benefits of EIF and GIF investments are contingent on their sustainability in longer term.

## 6 Value for Money

This section brings together the results of the previous sections to provide estimates of the value for money associated with the first two rounds of EIF and GIF. The analysis provides an assessment of projected benefit to cost ratios and return on UKCES spending, provides an examination of the relative value for money of different types of investment, and benchmarks the programmes against comparable initiatives.

### 6.1 Benefit to Cost Ratios

Table 6.1 below provides an assessment of the value for money associated with EIF and GIF investments in terms of:

- **Benefit to Cost Ratio (BCR):** The overall £s of economic benefits per £1 of resource costs incurred in the delivery of the investments. This measure examines the effectiveness of the interventions from the perspective of society as a whole (with the costs incurred by all parties, including UKCES, employers and the wider public sector incorporated as a cost)<sup>27</sup>.
- **Return on UKCES investment:** This is the £s of benefits per £1 of UKCES spending. This provides a measure of the efficiency of UKCES funding in delivering the economic benefits involved. In this measure, costs to employers and the wider public sector are included as social disbenefits, and are subtracted from the productivity gains associated with EIF and GIF investments<sup>28</sup>.
- **Return on public sector investment:** This is a similar measure to the one above, considering the overall efficiency of public sector investment rather than UKCES funding alone (i.e. £s of net economic benefits per £1 of public sector expenditure)<sup>29</sup>.

Given the objectives of EIF and GIF to stimulate employer investment in training, the return on UKCES investment may be the most appropriate measure of the cost-effectiveness of the programmes. Providing there is a net positive return to employers from training, these results will be higher the greater the level of investment leveraged.

As suggested in the previous sections, EIF and GIF are expected to be highly effective in leveraging private investment in training. GIF was particularly effective in leveraging in contributions from the private sector in the short term (with leverage ratios of £1.68 per £1 of spending expected in the short term), although both programmes have the potential to deliver leverage ratios in excess of £7 per £1 spent.

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<sup>27</sup> Measured as Total Benefits / (Delivery Costs + Wider Costs to Employers + Wider Costs to the Public Sector)

<sup>28</sup> Measured as (Total Benefits – Costs to Employer – Costs to the Public Sector – Leverage) / Costs to UKCES

<sup>29</sup> Measured as (Total Benefits – Costs to Employers – Leverage) / (Costs to UKCES + Costs to Wider Public Sector)

This is reflected in the rate of return. EIF and GIF investments are expected to deliver between **£18.41 and £81.95<sup>30</sup> in net social benefits per £1 invested** (as UKCES funding is a small component of the overall costs involved, these measures are highly sensitive to differences in the total benefits estimated under the low and high scenarios).

The width of the range is also driven by the uncertainty underlying the potential rates of deadweight associated with the training outcomes involved.

This analysis suggests that EIF and GIF potentially represent an effective use of public sector resources, and are expected to deliver between **£2.85 and £6.32 per £1 of public sector expenditure**. The overall benefit to cost ratio for EIF and GIF over the 10 year period under consideration is estimated at between **£1.46 and £1.79 per £1 of resource costs**. As EIF and GIF investments do not provide funding for training, the costs incurred by the wider public sector and in particular the employers engaged are likely to be substantial, and this will have the effect of depressing benefit to cost ratios when examined from the perspective of society as a whole.

The results also indicate that the investments made through GIF have potentially been less cost-effective than those delivered through EIF. On average, the EIF portfolio attained higher projected benefit-cost ratios and rates of return on both UKCES and public sector investment. Despite higher rates of private sector leverage, fewer training outcomes were projected per £1 of spending under GIF, leading to the lower value for money measures illustrated in the table below.

Additionally, the results suggest that in the short term (over the period in which UKCES is funding interventions), returns on investment are likely to be low. This reflects in part the payback period over which the returns of training are realising (for example, the Fifth Net Benefits of Apprenticeship Study commissioned by BIS in 2011 suggested that for many apprenticeship frameworks, it takes between two and three years for employers to recoup their initial investment). Nevertheless, a high proportion of the anticipated benefits are contingent on the forward sustainability of EIF and GIF investments (and if investments do not prove sustainable then lower returns may be likely).

Finally, it is also worth considering the benefits derived by employers. The total cost of EIF and GIF to employers is estimated at between **£1.6bn and £4.7bn** (assuming all future delivery costs will be funded by the private sector, and including increased expenditures on training). Employers are expected to directly benefit (in the form of additional profits) over the period by between **£1.0bn and £3.2bn**. In addition, employers may benefit through spill-over effects of between **£0.7bn and £2.6bn**.

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<sup>30</sup> Care has been taken to avoid giving point estimates for these ranges, as an understanding of the underlying uncertainties is needed to interpret the results appropriately.

While it is challenging to estimate a benefit-cost ratio for employers, these results suggest that employers may expect to derive between **£0.60 and £1.20 in additional profits per £1 of expenditure** (i.e. surpluses after all costs are accounted for<sup>31</sup>) over a 10 year period, depending on how far spill-over effects might be expected to accrue to the employers investing in the training.

As stressed throughout this report, the figures outlined in the table below should be treated with a substantial degree of caution. There are many underlying uncertainties, both with respect to how far the volume of anticipated training and employment outcomes will in practice be achieved by investments, and to the underlying evidence used to estimate rates of additionality.

**Table 6.1 Value for money measures (£s of benefits per £1 of costs)**

Cost / Benefit / VFM measure	2011/12 to 2014/15	Total	EIF	GIF
<b>Costs</b>				
UKCES funding (£m)	54	54	43	11
Employer contributions	45	45	25	20
Costs 2014/15 to 2021/22	0 - 0	196 – 348	111 – 217	86 - 131
Indirect costs – Employers	348 - 921	1,320 – 4,339	985 – 3,107	335 – 1,231
Indirect costs - Public Sector	85 - 137	458 - 771	152 – 372	306 - 399
<b>Total costs</b>	<b>532 - 1157</b>	<b>2,073 – 5,557</b>	<b>1,312 – 3,763</b>	<b>760 – 1,790</b>
<b>Benefits</b>				
Productivity gains	271 - 705	3,022 – 9,958	2,366 – 7,702	657 – 2,255
<b>Appraisal measures</b>				
BCR	0.51 - 0.61	<b>1.46 - 1.79</b>	1.80 - 2.05	0.86 - 1.26
Return on public sector spending	-0.87 - -1.36	<b>2.85 - 6.32</b>	6.40 - 10.49	0.67 - 2.13
Return to UKCES spending	-3.79 - -7.31	<b>18.41 - 81.95</b>	25.51 - 92.62	-8.63 - 43.27

## 6.2 Relative effectiveness of activities

The multi-activity nature of the investments funded by EIF and GIF makes it challenging to directly assess the relative value for money of the individual activities. However, an indicative analysis is provided below focused only on those investments that involve a single activity. This reduces the sample of investments available for analysis substantially, and it is only feasible to cover a limited range of intervention types (6 of the 12 under consideration). Nevertheless, this analysis yields some interesting findings:

- **Training brokerage:** From an analysis of investments providing training brokerage alone (4 investments), these interventions appear to be the most consistently effective (delivering median<sup>32</sup> benefit-cost ratios of more than £2 per £1 of costs under both high and low scenarios of additionality).

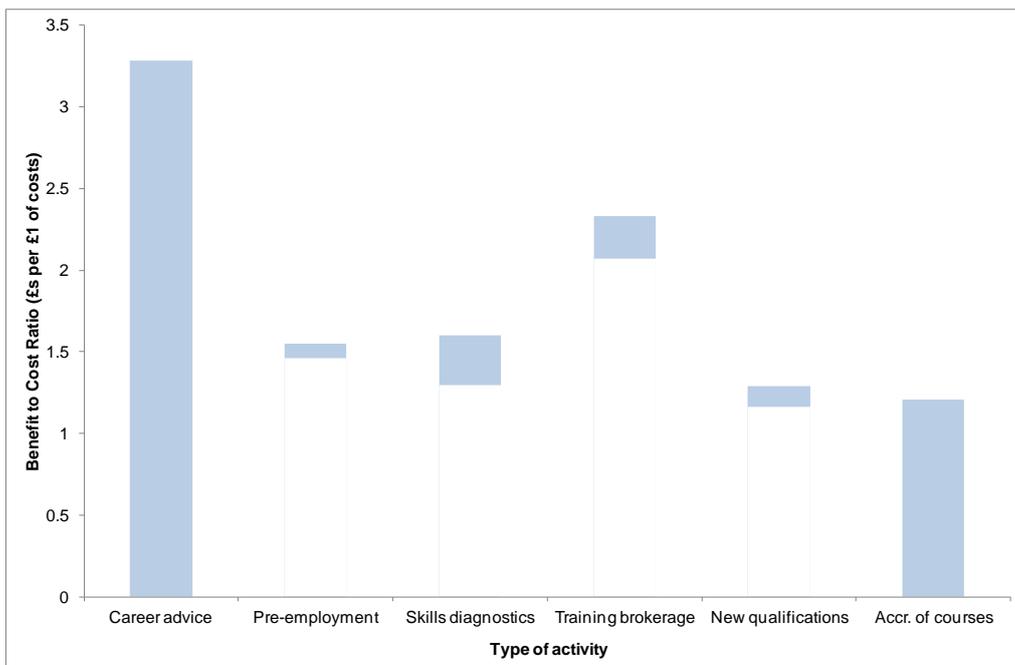
<sup>31</sup> I.e. net of any increase in expenditure on training.

<sup>32</sup> Medians were used to minimise the influence of outlying estimates on overall results, given the small number of investments upon which these figures are based.

- **Careers advice:** Careers advice activities reach large numbers of individuals at very low cost. As a consequence, even if their effectiveness in raising demand for training is very limited, they can potentially deliver highest returns on investment. However, as highlighted in the previous sections, past evaluation has not been able to show that these types of intervention have any material effect on decisions to take up learning. This is reflected in the results below, that suggest that on average (across 5 investments) these types of intervention are estimated to delivered between £0 and over £3 per £1 of expenditure.
- **New and accredited qualifications:** From the analysis, the development of new qualifications (9 interventions) and accreditation of existing qualifications (5 interventions) appear to be the least effective type of intervention (delivering a maximum of £1.50 per £1 spent). However, this will be in part be driven by the difficulties in taking into account quality effects: if new qualifications result in substantial quality improvements then the benefit-cost ratios set out below will consistently underestimate these impacts.

The figure below provides an illustration of these results. The chart shows the median benefit-cost ratios achieved under assumptions of low and high additionality, broken down by investment. The bars illustrate the cumulative impact of uncertainty relating to likely rates of deadweight and future delivery on the estimated benefit-cost ratios.

**Figure 6.1 Median Benefit to Cost Ratios, High to Low Range, by Activity**



Given the large uncertainty associated with careers advice interventions, it is worth considering the impact of these types of activity on overall value for money measures. Removal of the five investments concerned has a limited effect on these measures.

### 6.3 Benchmarking

There are substantial difficulties in benchmarking the results set out above against other comparable initiatives. Firstly, the volume of available studies that have attempted to monetise the benefits of public sector investment in skills infrastructure and other related interventions is not substantial.

Secondly, where this literature does exist, it has been developed with key methodological differences: many studies do not account for additionality (how far those outcomes might have been delivered anyway), and are often based the estimated lifetime impact on earnings (which will inflate estimates of overall productivity gains in comparisons to those set out here). Some attempts have been here to draw comparisons to this literature below.

## **Employer Ownership Pilot**

The most direct comparisons of the value for money estimates set out above are in regard to bids under the second round of the Employer Ownership Pilot. Early estimates derived from the value for money assessment of the bids received suggest that results align closely and are a reasonable benchmark. However, it is important to note that the valuation of Employer Ownership Pilot impacts were undertaken on a lifetime basis rather than the 10 year window employed in this *ex ante* study. Such a lifetime assessment can only realistically be made where the age of the workers involved are known, and it is not possible to estimate the impacts of EIF and GIF on a basis consistent to those generated by the Employer Ownership Pilot Programme.

## **Apprenticeships**

A 2012 National Audit Office review of apprenticeships suggested that the programme has generated £18 per £1 of public sector expenditure (and in terms of definition is comparable to the one set out in the table above). However, these results assumed that all training outcomes would not have occurred in the absence of the programme.

Additionally, productivity impacts were allowed to accrue over the lifetime of workers expected number of years in the workforce (rather than solely for a 10 year period). These results might be made more comparable by applying the estimates of deadweight loss associated with apprenticeships developed by BIS, suggesting that around 30 percent of apprentices would have received some form of training in the absence of the programme. This would bring estimated benefit-cost ratios down to just over £12 per £1 of public sector expenditure.

## **Regional Development Agencies**

The national evaluation of the Regional Development Agencies commissioned by BIS in 2008 incorporated a focus on the delivery of skills infrastructure projects (though this was largely in the form of construction of training facilities).

The results of five evaluations suggested a return on to RDA spending investment of between £1.10 and £5.20 per £1 spent (depending on the assumptions employed relating to the anticipated durability of those impacts). Again, these estimates are not directly comparable to the estimates provided here. The underlying evaluations were undertaken using the Impact Evaluation Framework as a template: in general, these studies focused largely on short run demand side impacts at a regional level (rather than examining impacts on aggregate supply at a national level, as is the case here).

As rates of displacement tend to rise at larger spatial scales, the net impacts of these interventions at a national level would have likely been substantially lower than suggested by the meta-review. Additionally, these evaluations did not typically account for the full resource costs associated with training (and in particular, the costs incurred by employers in engaging with the infrastructure developed), which will have again inflated estimates of return on investment.

### **Overall value for money assessment**

Overall, the results would suggest that the EIF and GIF programmes are projected to deliver a rate of return that is potentially in the upper ranges of what might be expected for interventions of this nature. While the programme may not reach the rates of return associated with apprenticeships (as estimated by the NAO), this may represent an upper bound for what might be achievable as they are based on those employers that do not require further encouragement to invest in such training. The EIF and GIF programmes are predicated on the assumption that further public expenditure is required to encourage additional employer investment in skills, and as a consequence, benefit-cost ratios will inevitably be lower than estimated by the NAO.

However, while the potential rates of return may be relatively high, there are also substantial risks involved. In particular, higher rates of return are contingent on the ongoing sustainability of investment activity. This cannot be guaranteed, and if a large number of investments fail to reach a position in which their maintenance can be sustained over a long duration of time, then the return on public spending may fall substantially.

## 6.4 Wider issues raised by the *ex-ante* study

This study has raised a number of wider issues associated with the monitoring systems underpinning the application, appraisal and performance management process.

### **Sustainability of investments**

Delivery partners often did not hold long term business planning information for the delivery of their investments for an extensive period beyond the lifetime of UKCES funding. It is acknowledged that to some extent, an implicit objective of EIF and GIF at the initial stage was to support SSC's transition from a grant to an investment funding model. There has likely been an element of cultural adjustment as result of wider changes in funding models, which may account for the absence of systematic long term planning across the investment portfolio.

However, even allowing for the fact that many initiatives are pilot schemes, the absence of any planning information is potentially a concern and could suggest that plans for resourcing the on-going maintenance of the investments concerned are poorly formulated at present.

Although findings emerging from evaluation studies have generated some positive findings with respect to sustainability<sup>33</sup>, it is suggested that (given the likely importance of sustainability in delivering overall benefits) a longer term view with respect to requirements for business planning as part of any future application and contracting process is taken.

Long term monitoring will also be important to address any issues with moral hazard (i.e. there is a potential risk that investees will feel free to adjust towards lower risk and lower impact activities from the point at which UKCES monitoring ceases), alongside clauses giving UKCES contractual leverage over a greater duration (this will be particularly important for investments that backload the delivery of training outcomes).

### **Supporting information requested from prospective investees**

The single greatest challenge in developing an *ex-ante* assessment of the impacts of EIF and GIF projects has been the lack of consistent and comprehensive monitoring information on the training outcomes expected by investments.

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<sup>33</sup> See Qualitative Evaluation of Demand-led Skills Solutions: Growth and Innovation Funder and Employer Investment Fund, UKCES, 2013 and Planning for Sustainability: Thematic Paper, UKCES, 2013. Available: [www.ukces.org.uk/publications/er78-qualitative-evaluation-of-demand-led-skills](http://www.ukces.org.uk/publications/er78-qualitative-evaluation-of-demand-led-skills)

The flexible process by which UKCES has agreed ad-hoc deliverables with delivery partners has led to situations in which some investments are being held to account only for their engagement with individuals and employers (and not against the arguably higher standard of delivering training outcomes). This is a major weakness of the monitoring regime given the key objective of EIF and GIF, and the primary driver of associated economic and social benefits,- is to increase the volume and quality of training provided by employers.

In light of this it is strongly recommended that a move to a more systematic approach of capturing anticipated training outcomes is made in any future investment programmes. At a minimum, applicants should be expected to provide annual forecasts of the volumes of individuals completing training, by level of training provided (including the provision of general off-the-job training).

Given the emphasis on the sustainability of projects beyond the lifetime of UKCES funding, this should also incorporate forward forecasts of costs, benefits, and income up to 10 years. This will both facilitate transparent comparisons between the packages of training outcomes proposed by applicants and provide a clear framework for monitoring progress and success that is focused on the key outcomes of interest. Minimum requirements might include:

- Projections of annual delivery costs and sources of income, including projections for an appropriate period after the investment has concluded.
- Projections of expected training and employment outcomes that will be achieved, broken down by year, level for the same period as financial projections. Ideally, these projections would be apportioned to the types of activity involved.

This finding aligns with recommendations of other UKCES formative evaluation work that highlights a need to embed common outcome indicators across the portfolio of projects funded<sup>34</sup>.

The development of a 'Ready Reckoner' appraisal tool (see Appendix B) will aid this process and efforts are already being made to systematise the definition of outcome indicators as part of round two of the Employer Ownership Pilot. Embedding such an approach more widely in the future design of a programme will give more clarity to the reporting progress across the investment portfolio at a board level.

### **Issues for ex-post evaluation and wider research**

The *ex-ante* assessment of impact has raised a number of issues that might usefully be given scrutiny in an ex-post evaluation of EIF and GIF. These include:

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<sup>34</sup> For example, see the recommendations made as part of 'An Initial Formative Evaluation of Best Market Solutions', UKCES, September 2012.

- **Project additionality:** This *ex-ante* evaluation has been developed on the basis of an assumption that all projects would not have gone ahead in the absence of UKCES funding. This assumption will require testing in an ex-post evaluation: if projects would have otherwise been viable with public sector investment, then while many of the costs implied in this study (such as wider costs to the public and private sector) would also have been incurred anyway, the use of public resources to fund delivery may represent a loss of social welfare and this would need to be considered in detail through qualitative research at the ex-post stage. This would require detailed scrutiny of attempts made by delivery partners to secure alternative sources of funding to deliver their infrastructure investments.
- **Qualitative additionality:** There is a general absence of evidence on the quality effects of skills infrastructure investment. Again, an ex-post evaluation would usefully establish the impacts of EIF and GIF in terms of raising the quality and relevance of training provision and effects on the productivity of workers benefitting from this provision. These types of effect will be potentially observable by examining the performance of firms using EIF and GIF infrastructure investments on a longitudinal basis: observable in growth in GVA per worker at a firm level (comparing performance before and after utilisation of the infrastructure involved). However, it will also be necessary to investigate how the composition of training has changed over time, and in particular how there has been any drift towards higher levels of training following the introduction or use of EIF and GIF infrastructure products.
- **Sustainability:** A positive return on investment is contingent on the long-term sustainability of EIF and GIF infrastructure investments. A clear priority for any ex-post evaluation of the programmes will be to consider how far skills infrastructure investments have been maintained by delivery partners (including how maintenance costs have been met following the withdrawal of UKCES funding). Depending on when an ex-post evaluation might take place, an assessment of likely future sustainability will be required. This could involve detailed inspection of the monetisation model developed by delivery partners, growth in the numbers of users, as well an assessment of the income being generated by the investments concerned.
- **General evidence on additionality:** The literature review underpinning this study suggested that the attempts to robustly quantify the economic effects of skills infrastructure investment have been limited (contrasting substantially with studies aiming to quantify the economic impacts of training itself). An ex-post evaluation of EIF and GIF could potentially contribute substantial understanding of what works in skills infrastructure investment, which can then feed back into appraisal methodologies to improve decision making in the longer term.

- **Intangible effects:** Finally, this study has excluded any consideration of the potential intangible effects of EIF and GIF investment (those effects that cannot be straightforwardly measured or linked to training outcomes). An ex-post evaluation would usefully consider these types of effect through qualitative research with employers within the industries targeted by EIF and GIF interventions.

## Appendix A: Overview of Key Assumptions

### 1. Gross training and employment outcomes

Projections on the gross training and employment outcomes of each EIF and GIF investment were developed as follows:

- Training and employment outcomes over the duration of UKCES funding were taken from the most recent Investment Plans.
- Training and employment outcomes were allocated to the different types of activity. Where a single investment involved multiple forms of activity, these outcomes were broken down across types accordingly.
- Where sufficient information was available to do so, training outcomes were also allocated to the level and type of training involved (as identified by applicants within application forms or Investment Plans).

These were converted into future projections of **training and employment** outcomes as follows:

- Application forms and Investment Plans were mined for additional information on any expectations of future levels of activity beyond the period UKCES funding. Where this information was available, this formed the basis of forward projections. For example, if an applicant indicated they expected to deliver 1,000 apprenticeship starts in 2017, this was built directly into projections at an investment level. If there were gaps in these projects (for example, if data was available only for 2013, 2017, and 2020), an assumption of linear growth in the intervening period was applied.
- Delivery partners were asked to provide longer term projections of training and employment outcomes they expected to deliver after UKCES funding came to an end (on an annual basis). This formed the basis of the projection where they were able to do so.
- Any gaps were filled by assuming that activity would stabilize at the levels provided by delivery partners (between 80 and 120 percent). For example, if an applicant indicated they expected to deliver 100 apprenticeship starts in 2014 but provided no further information, an assumption was made that in each year between 2015 and 2022, they would deliver between 80 and 120 apprenticeships starts.

Finally, where training outcomes were reported as starts, this was converted into measures of **completions** using:

- Estimates of completion rates by qualification published by BIS.

- Estimates of the duration of training taken from a range of survey based sources (such as the Apprenticeship Evaluation: Learner Survey commissioned by BIS). Off-the-job training and non-accredited training assumed to complete in the year in started.
- Training outcomes at an investment level were aggregated to provide a programme level view (by type and level of learning).

## 2. Gross additional training and employment outcomes

Estimates of the gross additional training and employment outcomes were derived by applying the relevant assumptions in the table below (i.e. gross additional outcomes is equal to gross outcomes x (1 - deadweight)).

These assumptions were applied at an investment level to the training and employment outcomes delivered by each activity involved. As an example, if an investment was planning to deliver 100 individuals into work through employment brokerage and 100 apprenticeship starts through a GTA, it was estimated that between 50 and 70 additional individuals would move into work and between 20 and 45 additional apprenticeship starts.

Again, results at an investment level were aggregated to give the programme level figures set out in table 4.4.

**Table A.1 Deadweight Assumptions**

Type	Range for deadweight <sup>35</sup>
Careers advice	98% to 100%
Pre-employment support	30% to 45%
Employment brokerage	30% to 50%
Training brokerage	40% to 75%
Skills diagnostic	40% to 75%
Apprenticeship brokerage	55% to 80%
GTA	55% to 80%
Employment of Apprentices	40% to 45%
Accreditation of training providers	60% to 100%
Accreditation of training courses	60% to 100%
Creation of new qualifications	15% to 60%
Networks	50% to 100%

<sup>35</sup> The percentage of training outcomes that would be delivered in the absence of UKCES funding.

### 3. Gross additional wage gains

Estimates of the gross additional wage gains associated with training outcomes were estimated on the basis of the wage premia set out in the table below. These premia were applied to median earnings at an investment level (giving annual increases in earnings). In the case of apprenticeships, industry level wage premia were derived from the available literature.

These increases were assumed to endure for the duration of the 10 year window under consideration. For example, if a trainee was expected to complete a level 3 apprenticeship in the construction industry in 2017, an industry level wage premia of 13.1 percent (the 19.0 percent set out in the table below is an average across industries) was applied to median earnings in the construction industry of £27,600. This gives an annual increase in earnings of £3,000, and a total wage gain of £15,000 over the remaining 5 years under consideration (i.e. 2017/18 to 2022/23) before discounting.

**Table A.2 Wage premia assumptions**

Type of training	Wage premia (% per annum)
<b>General training</b>	
Non-accredited training	2.2%
General learning outcomes	Average of all training types
<b>Vocational qualifications</b>	
Level 1	7.4%
Level 2	8.5%
Level 3	10.5%
Level 4	10.0%
<b>Apprenticeships</b>	
Intermediate	8.9%
Advanced and above	19.0%
Unknown level	Average of the above

In the case of **individuals moving into work**, wages accruing were estimated on the basis of:

- GVA per worker in the industry of interest;
- the ratio of wages to GVA (approximately 50 percent of GVA represents employment costs, as indicated by the Annual Business Survey sponsored by ONS);
- an assumption that vacancies filled would endure for 3 years was applied, reflecting guidance developed by BIS (although these benefit streams were cut off by the 10 year appraisal period).

As an example, an individual moving into work in the manufacturing industry might be expected to produce £48,600 in GVA per annum. The assumption is that £24,300 of this output would represent wage gains.

#### **4. Firm level profits**

In the case of firm level profits from training, firms were assumed to derive an equal benefit as workers (i.e. increases in firm level profitability were assumed to be equal to wage gains).

For employment outcomes, the remaining 50 percent of GVA created was assumed to be taken in profits (reflecting the national accounting identity that GVA is equal to the sum of wages and profits).

#### **5. Spill-over effects**

Spill-over effects were only assumed to apply in the case of training outcomes. These were valued at 50 percent of the overall direct increase in output estimated as a result of training (wages and profits). If the direct gain in output was estimated at £1m, a further £0.5m would be estimated in spill-over effects.

#### **6. Displacement and substitution**

Displacement and substitution was assumed to be negligible, except in the case of pre-employment support where a rate of displacement of 0 to 15 percent was applied. Net impacts were estimated as gross impact x (1 - displacement).

## Appendix B: Ready Reckoner

As part of this study, a 'Ready Reckoner' was developed, a spreadsheet appraisal tool, designed to aid decision making with respect to appraisal of new applications for EIF and GIF funding within UKCES and handling variations to existing contracts with delivery partners.

The Ready Reckoner provides estimates of the value of future economic and social benefits associated with the training and employment outcomes of EIF and GIF infrastructure over a 10 year time horizon.

The tool was commissioned to support future decision making through:

- **Appraisal:** Allowing direct comparisons between applications for funding in terms of the anticipated value for money associated with the different packages of training outcomes being offered by different delivery partners.
- **Contract variation:** Supporting negotiation of variations to contracts, by aiding an understanding of the potential impact on value for money associated with proposals made by delivery partners.

The Ready Reckoner requires users to input the following information with respect to each investment:

- **Costs:** Information on the anticipated costs associated with the delivery of different investments, and how those costs will be met (UKCES funding, employer contributions, and income derived from fees associated with the infrastructure developed).
- **Training outcomes:** Information on the likely training outcomes associated with the activities proposed.
- **Judgement:** In an appraisal context, assessors will also need to make a judgement about how far projects would have proceeded without UKCES funding, and on the level of implementation risk associated with projects.

The sources to gather this information will vary depending on whether the Ready Reckoner is being used at the point of appraisal or handle a variation in contract. At the point of appraisal, the assessment will be made on the basis of information in the application forms and costing schedules submitted as part of the application.

At the point of assessing contract variations this information will be used in conjunction with further documents produced at the time of signing the contract, including costing schedules, Investment Plans, and detailed proposals for contract variations provided.

The Ready Reckoner estimates the potential value of training outcomes on the basis of wider academic research and evaluation evidence. This includes estimates of additionality that are 'hard wired' into the spreadsheet tool. These estimates are related back to costs to provide a range of appraisal metrics describing the value for money associated with individual investments.

## Appendix C: Health impacts

A range of research has shown a link between education and both mental and physical health outcomes. This section sets out an indicative assessment of the potential health impacts of EIF and GIF, although the findings should be treated with a high degree of caution given that the available secondary evidence has not found a causal link between skills and health.

A 2012 NRDC study investigating the links between education, basic skills, and health related outcomes found that higher levels of educational attainment were correlated with lower rates of smoking and heavy drinking. Table C.1 below provides quantitative estimates of these relationships based on these studies.

**Table C.1 Relationship between educational attainment, smoking, and heavy drinking**

Educational attainment level	Reduction in probability of smoking relative to lower education attainment levels	Reduction in probability of heavy drinking relative to lower education attainment levels
Level 1	0.064	0.044
Level 2	0.049	0.019
Level 3	0.023	0.008
Level 4	0.066	0.053

Estimates of the possible value of these outcomes have been made adopting the following assumptions:

- **QALYs gained:** Estimates of (quality adjusted) life expectancy impacts associated with quitting smoking and moving from heavy to moderate drinking have been assumed to be 1.29 and 0.32 respectively<sup>36</sup>.
- **Willingness to pay for a QALY:** Estimates of QALYs gained were estimated on the basis of recent experimental research that suggested average willingness to pay for a QALY gained was £20,000 (although these results were heavily caveated by the authors)<sup>37</sup>.

**Table C.2 Unit value of health outcomes associated with educational attainment**

Educational attainment level	Smoking	Heavy Drinking	Total value
Level 1	£1,280	£880	£2,160
Level 2	£980	£370	£1,350
Level 3	£460	£150	£610
Level 4	£1,320	£1,060	£2,380

<sup>36</sup> Prioritising Interventions in Public Health, Health England, 2009

<sup>37</sup> Weighting and Valuing Quality Adjusted Life Years Using Stated Preference Methods: Preliminary Results from the Social Value of a QALY Project, Health Technology Assessment Programme, 2010

Application of these assumptions to estimated net training outcomes are set out in table C.3 below. The present value of health outcomes are estimated at between £30m and £93m and are relatively insignificant in comparison to the economic benefits of EIF and GIF investments.

**Table C.3 Projections of health impacts (£ms)**

Type of training	Low additionality of training outcomes and low future projected activity (80% of final year outcomes)			High additionality of training outcomes and high future projected activity (120% of final year outcomes)		
	2011/12 to 2014/15	2015/16 to 2021/22	Total	2011/12 to 2014/15	2015/16 to 2021/22	Total
Value of health impacts	4	33	37	8	109	117
<b>Present value of health impacts</b>	4	26	30	7	85	93

## Appendix D: Evidence Base

### A. Inflation

The study used the HM Treasury GDP Deflator series to account for future inflation of consumer and producer prices. Values are only published to 2017/18, and growth in producer prices is assumed to continue at these rates to end of the 10 year period.

**Table D.1 GDP Deflator**

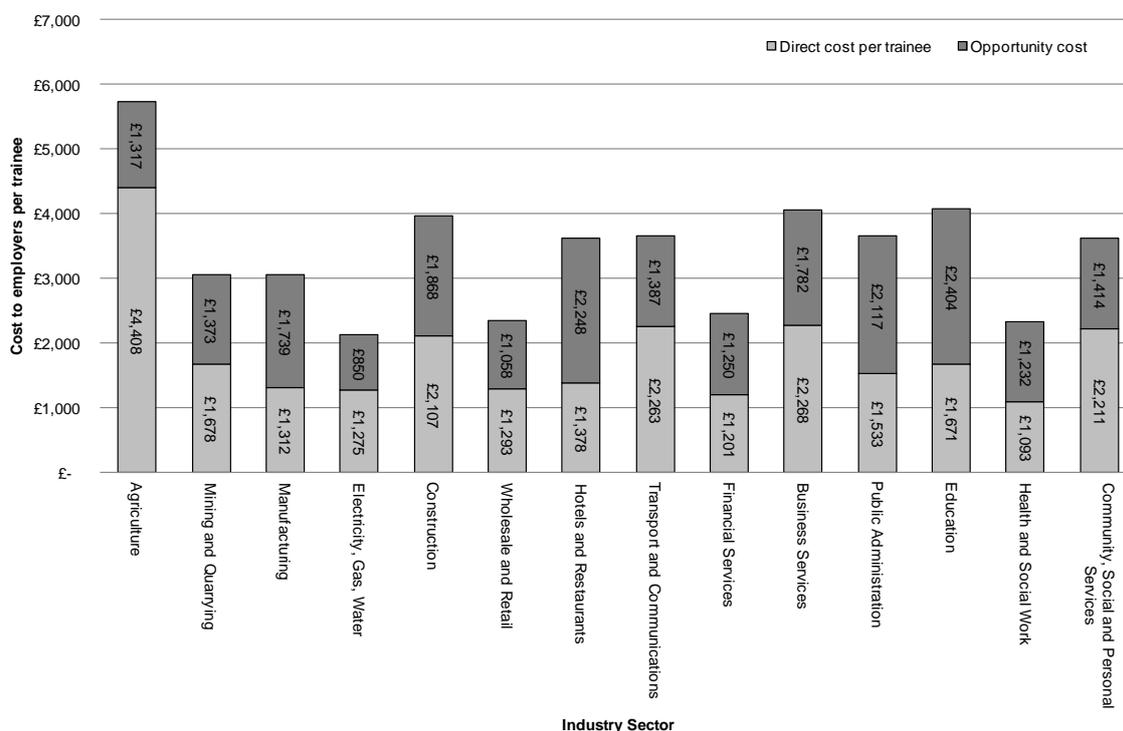
Year	GDP Deflator (Index)	Percentage Change on Previous Year
2013-14	100.0	2.3
2014-15	101.9	1.9
2015-16	103.7	1.8
2016-17	105.5	1.7
2017-18	107.3	1.7
2018-19	109.1	1.7
2019-20	111.0	1.7
2020-21	112.9	1.7
2021-22	114.8	1.7
2022-23	116.7	1.7

### B. Indirect costs of training

There will be a range of costs to employers in delivering the training outcomes involved which can be broadly broken down into direct costs (expenditure on training) and opportunity costs (costs of releasing workers for training). Where employers have taken on apprentices, there may be further opportunity costs in the form of supervising trainees.

There is a relatively limited evidence base upon which an assessment of the full range of these costs might be based. However, the UK Commission's Employer Skills Survey provides estimates of the average cost of training to employers of £3,275 (cost per trainee, covering both off and on-the-job training of all types). This estimate incorporates both the direct costs of training, and opportunity costs in the form of wages paid to trainees while in training (reflecting an approximation of the foregone production value). This average masks substantial variation by industry sector, as highlighted in the figure below.

**Figure D.1 Costs to employers of training per trainee (2011)**



Source: National Employer Skills Survey, UKCES, 2011

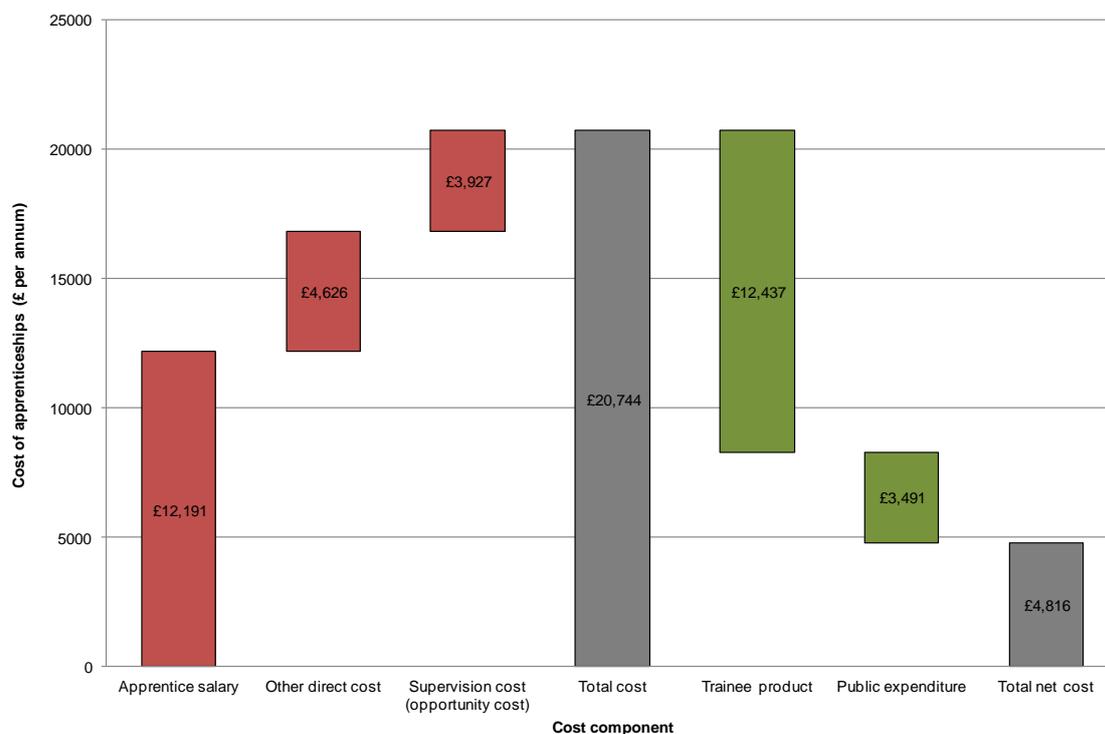
The costs to employers associated with apprenticeships can be considered as distinct from those associated with general employer investment in training. Apprenticeships involve a range of additional costs associated with recruitment, administration, and supervision that are not captured within the estimates set out above. However, employers routinely receive funding from the public sector for a share of the costs involved.

The cost of apprenticeships for employers have been estimated in detail by BIS (2012)<sup>38</sup> covering direct costs (apprentice pay, recruitment costs, course fees and administrative costs)<sup>39</sup>. Opportunity costs in the form of additional supervision costs were also estimated on the basis of the time spent by line managers supervising trainees (again, serving as an approximation for foregone productivity). The study also provided estimates of the value of the output produced by apprentices, suggesting that apprentices were paid in line with the value of their marginal product. The overall net cost to employers per apprentice per annum has been estimated as £4,816, as illustrated in the figure below.

<sup>38</sup> Fifth Net Benefits of Apprenticeships Study, BIS, 2012

<sup>39</sup> A similar exercise was undertaken by the National Audit Office in 2012 (Estimating Economic Benefits of Apprenticeships), but did not provide details on the value of direct and opportunity costs used in analysis.

**Figure D.2 Costs to employers associated with apprentices (£ per annum)**



Source: Adapted from the *Fifth Net Benefits of Apprenticeships Study*, BIS, 2012

Further research commissioned by BIS (Research Paper 53: Returns to Intermediate and Low Level Qualifications) provides estimates of the indirect costs associated with other types of qualifications. The available results are summarised in the table below.

**Table D.2 Indirect costs of vocational training**

Level of training	Indirect costs to employers	Indirect costs to the wider public sector
<b>General training</b>		
General off-the-job training	£ 3,409	n.a.
<b>Vocational qualifications</b>		
Level 1	£ 1,203	£ 1,795
Level 2	£ 1,786	£ 3,926
Level 3	£ 1,118	£ 7,040
Level 4	£ 7,565	£ 4,096
<b>Apprenticeships</b>		
All apprenticeships	£4,816	£ 3,491

### C. Duration of Course

Estimates of the duration of course at different levels have been compiled from various BIS research reports as set out in the table below:

**Table D.3 Length of vocational training and apprenticeship programmes (years)**

Vocational training				Apprenticeships	
Level 1	Level 2	Level 3	Level 4	Level 2	Level 3-4
0,5	1,5	2,5	1,5	1	2

Source: BIS (2011) Research Paper no. 53, BIS (2011) Research Paper no. 45

#### D. Industrial weights (costs)

Variations in indirect costs of qualifications by industry are only available with respect to general on the job training (through 2011 Employer Skills Survey) and for Apprenticeships (BIS 2012, Research Paper no. 67). The indirect costs of Level 1 vocational qualifications are assumed to vary in line with general training, while Level 2, 3 and 4 vocational qualifications are assumed to vary in line with apprenticeships.

**Table D.4 Weights on employer costs differences across industries**

	Weights for employer costs	
	General training	Apprenticeships
Accommodation and food service activities	106%	72%
Administrative and support service activities	119%	75%
Agriculture, forestry and fishing	168%	100%
Arts, entertainment and recreation	100%	100%
Construction	117%	110%
Education	120%	100%
Electricity, gas, steam and air conditioning supply	62%	100%
Financial and insurance activities	72%	86%
Human health and social work activities	68%	96%
Information and Communication	107%	132%
Manufacturing	89%	139%
Mining and quarrying	89%	100%
Other service activities	106%	100%
Professional, scientific and technical activities	119%	139%
Public administration and defence; compulsory social security	107%	100%
Real estate activities	100%	100%
Transportation and storage	107%	132%
Water supply; sewerage, waste management and remediation activities	62%	100%
Wholesale and retail trade; repair of motor vehicles and motorcycles	69%	90%

## E. Wage premiums

A considerable body of literature has been produced in estimating the wage returns of training. In broad terms, EIF and GIF investments will lead to the delivery of two main types of training outcomes: apprenticeships, and more general training not linked to the attainment of any qualification and are provided to individuals already in employment (i.e. what is termed on-the-job training programmes in the literature, although this would also include what is described as off-the-job training within the UKCES Employer Skills Survey).

The table below summarises the results of a number of international studies on the impact of the receipt of on-the-job training on wages. Internationally, estimates of the impact of on-the-job training on wages has varied substantially (from as low as 1 percent up to over 20 percent). However, those studies that were able to correct for selection bias (through fixed effects or instrumental variables approaches) found lower returns on average to on-the-job training.

Given the findings in the table below, a conservative assumption of a wage impact of 2 to 2.5 percent in *ex-ante* modelling (towards the lower end of the range of estimates of the impact of on-the-job training in the UK) was adopted.

**Table D.5 Impact of on-the-job training on wages**

Study	Country	Average impact	Impact corrected for selection bias
Haelermans (2012)	Meta analysis	2.6%	
Blundell et al. (1999)	UK		5%
Booth and Bryan (2002)	UK	2.40%	
Gerfin (2004)	Switzerland	1.10%	
OECD (2004)	11 EU countries	1.20%	
	USA	11.60%	
Parent (1999)		12.90%	
Lengermann (1999)	USA	4.00%	
	USA	2.80%	
Loewenstein and Spletzer (1998)		4.50%	
Ballot (2004)	France	12-13%	
Konings & Vanormelingen (2010)	Belgium	11-12%	
	UK	7.9%	1.9%
	Denmark	4.2%	2.0%
	Netherlands	3.7%	0.0%
	Belgium	5.5%	2.6%
	France	7.2%	0.0%
	Ireland	8.1%	0.0%
	Italy	9.7%	3.8%
Bassanini (2007)	Greece	21.6%	6.0%

Study	Country	Average impact	Impact corrected for selection bias
	Spain	7.2%	1.0%
	Portugal	18.0%	10.5%
	Austria	10.3%	0.0%
	Finland	5.5%	3.8%
Goux and Maurin (2000)	France		0%
Parent (2003)	Canada		10%
Krueger and Rouse (1998)	US		0.4-0.7%

The wage returns to apprenticeships and other vocational qualifications have also been considered by numerous studies (and results are summarised in the table below). These studies have tended to find a substantial wage premium to the completion of an apprenticeship (in the order of 10 to 20 percent in comparison to lower level qualifications). Results across the studies were also relatively consistent across levels. An average of the figures set out in the table below were used to develop appropriate assumptions for the *ex-ante* modelling exercise (although it should be noted that these studies do not take a comprehensive approach for addressing sample selection issues and as a consequence may overstate the impacts involved).

**Table D.6 Impact of apprenticeships on wages**

Study	Measure	Advanced apprenticeships (Compared to level 1 qualifications)	Intermediate apprenticeships (Compared to Level 1 or 2 qualifications)
NAO (2012)	Weekly earnings 2004-2010	17.9%	10.6%
NAO (2012)	Hourly earnings 2004-2010	12.9%	7.9%
Conlon et al. (2011)	Hourly earnings 2004-2009	13.3%	7.9%
Conlon et al. (2011)	McIntosh approach, Weekly earnings 2004-2009	22.4%	11.7%
McIntosh (2007)	Weekly earnings 2004-2005	17.7%	15.6%

**Table D.7 Wage premia associated with different types of training and qualification**

	Source	Wage Premium
<b>Vocational qualifications</b>		
Level 1	BIS (2011) Research Paper no. 53	7.4%
Level 2	BIS (2011) Research Paper no. 53	8.5%
Level 3	BIS (2011) Research Paper no. 53	10.5%
Level 4	BIS (2011) Research Paper no. 45	10%

Note: \*A wage premium of 2.2% is incorporated in the Ready Reckoner.

As with general training, the costs involved with apprenticeships also vary substantially by industry. However, the duration of apprenticeships also varied substantially by sector, with a substantial impact on costs: while a survey of apprentices undertaken in 2011<sup>40</sup> found that most apprenticeships endure for between 6 and 18 months, the BIS study found engineering and construction apprenticeships tended to last for 3.5 years in comparison to 1 to 1.5 years in the other industries considered.

## F. Median Earnings by Industry

Median earnings by industry used in the study are set out in the table below.

**Table D.8 Annual earnings across industries**

	<b>Median gross annual earnings (£)</b>
Accommodation and food service activities	16,141
Administrative and support service activities	21,504
Agriculture, forestry and fishing	20,075
Arts, entertainment and recreation	21,178
Construction	27,596
Education	28,608
Electricity, gas, steam and air conditioning supply	36,202
Financial and insurance activities	35,697
Human health and social work activities	24,554
Information and Communication	35,028
Manufacturing	26,226
Mining and quarrying	41,023
Other service activities	22,765
Professional, scientific and technical activities	32,277
Public administration and defence; compulsory social security	30,578
Real estate activities	25,071
Transportation and storage	26,239
Water supply; sewerage, waste management and remediation activities	27,440
Wholesale and retail trade; repair of motor vehicles and motorcycles	20,400

Source: Annual Survey of Hours and Earnings, 2011, ONS.

## G. Firm Level Impacts

The lack of datasets providing information on both the provision of training and performance of firms has meant that studies directly quantifying the productivity gains of training at a firm level (in terms of GVA or turnover per worker) are less common. The main focus of the academic research in this area has been to provide an understanding of how the benefits of productivity gains associated with training break down between employers and employees.

<sup>40</sup> Apprenticeship Evaluation: Learner Survey, BIS, 2011

All studies reviewed as part of this exercise suggested that the overall increase in productivity associated with training was substantially larger than those experienced by workers in the form of earnings. A 2006 study in the UK found that overall productivity gains associated with training were roughly twice as large as the wage returns seen by workers, although other European studies have found much larger productivity impacts.

There was little evidence on the impacts of apprenticeships on workplace productivity, although a recent study suggested that the presence of an apprentice in the workplace over the last 12 months led to no statistically significant impact. However, the time horizons over which the impacts are considered may too short to have allowed productivity effects to be observed. The National Audit Office, in a 2012 review, made a conservative assumption that workplaces would see productivity gains of 25 percent over and above the earnings of apprentices.

In light of these results, it was agreed that in the case of general training, an assumption that firm level productivity gains will be twice as high as wage returns. In the case of apprenticeships, assumptions in line with National Audit Office will be adopted which are more conservative, reflecting the wider studies have not been able to show that apprenticeships have led to a substantial impact on firm level productivity at least in the short term.

**Table D.9 Impact of training on firm level productivity (relative to wage returns)**

Study	Measure	Apprenticeships	On-the-job training
Dearden et al. (2005)	UK		200%
NAO (2012)	UK	125% (assumption)	
Barron et al. (1989)	US		200%
Groot (1999)	Netherlands		400-500%
Conti (2005)	Italy		300-400%
Ballot et al. (2004)	Sweden		300%
Ballot et al. (2004)	France		350%
Konings & Vanormelingen (2010)	Belgium		150-200%
McIntosh et al. (2011)	UK	Non significant	

## H. Spill over effects

There are a number of reasons to expect that benefits at the industry level will exceed those at the firm level. Employees receiving training may be expected to interact not just with other employees in the firm but also with other agents such as suppliers or clients, supporting the diffusion of knowledge. Turnover of employees will also facilitate the spread of the knowledge and good practice across the industry as employees move to competitors (i.e. poaching externalities). Additionally, the creation of new businesses by former employees may facilitate the implementation of more efficient technologies and innovative practices that will help enhance the productivity of the industry overall.

A small number of studies have investigated these issues. De Grip (2012) finds an increase in the proportion of employees being trained by 10 percentage points leads to a 0.5 percent increase in the productivity of their peers. Other studies that have quantified the relationship between training provision and productivity at an industry level confirm that these gains exceed those observed at a firm level. Dearden et al. (2006) find that within the UK, the impact of training at an industry level are double in magnitude compared to firm level productivity gains, tentatively explained by the mentioned training spill-overs.

It was agreed that these types of spill-over effect are included in the *ex-ante* evaluation (on the basis of the latter study) but are presented separately to highlight that the strength of the available evidence is more limited in this area. It was also agreed that the scale of these effects are potentially dampened by 50 percent to avoid any potential overstatement of impacts (with sensitivity analysis incorporated to allow for scenarios in which the full estimated effect is assumed).

## G. Additionality

A discussion of evaluation evidence illustrating the potential scale of deadweight is set out in the table below:

- **Careers advice and guidance:** There is limited evidence on the impact of careers advice and guidance on the probability that particular individuals take up learning. A 1999 Department for Education Review 'Assessing the Net Added Value of Advice and Guidance,' suggested that take up of careers advice and guidance suggested that these activities had no statistically significant effect on the probability that young people took up further learning. In light of the likely low impact of these activities, a range for deadweight associated with any training outcomes of between 98 and 100 percent is assumed for any training outcomes associated with careers advice and guidance.

- **Pre-employment support and employment brokerage:** Although there has been substantial research into the impacts of DWP initiatives on employment outcomes, there is little in the way of specific evidence on the net impacts of these two types of intervention. The Ready Reckoner uses estimates of a BIS review of close to 50 evaluation studies that suggest an average value for deadweight associated with interventions designed to match people to jobs (analogous to employment brokerage) of 42 percent and 39 percent for skills and workforce development activities. Ranges for deadweight based on the 95% confidence intervals presented have been adopted in the Ready Reckoner.
- **Skills diagnostics and training brokerage:** Estimates for the value of deadweight loss associated the training outcomes delivered by skills diagnostics are drawn primarily from a previous assessment of the deadweight loss associated with the Train To Gain initiative undertaken by BIS in 2012 (a scheme providing similar types of support to firms). This study suggested that users of Train to Gain trained around 54 percent of their workforce in comparison to 40 percent amongst a matched comparison sample of non-users. Although the authors were unable to confidently develop an estimate of the deadweight associated with training outcomes for Train to Gain, this is suggestive of relatively high rates of deadweight loss (75 percent). This is in line with estimates of deadweight developed for the Employer Training Pilots precursor programme, although higher than estimates derived from self-reported estimates of additionality (from 5 to 50 percent with respect to Train to Gain, and an average of 39 percent across 29 evaluations of workforce development initiatives more generally). The Ready Reckoner assumes a range for deadweight of 40 to 75 percent to reflect this evidence base.
- **Group Training Associations, Apprenticeship Brokerage, and Employment of Apprentices:** A systematic assessment of the deadweight loss associated with apprentices undertaken by BIS in 2012 suggested that 28 percent of all apprentices would have otherwise have received some other form of training. However, estimates of deadweight loss in this case also need to account for how far employers using the infrastructure involved would have otherwise created places for apprentices:
- **Employment of apprentices:** An evaluation of Apprentice Grants for Employers (using self-reported measures of additionality) suggested that financial incentives to employers led to moderate levels of deadweight of 16 to 21 percent (suggesting overall deadweight of interventions based on Employment of Apprentices of between 40 and 45 percent<sup>41</sup>).

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<sup>41</sup> Accounting for both the probability apprentices would have otherwise found training and the probability employers would have otherwise taken on apprentices.

- **GTAs and apprenticeship brokerage:** There has been limited systematic quantitative research into the net impacts of GTAs and apprenticeship brokerage mechanisms (such as ATAs)<sup>42</sup>, and rates of deadweight have been assumed in this case have been assumed to be similar to training brokerage interventions (implying a range for deadweight of between 55 percent and 80 percent).
- **Accreditation of training providers and courses:** As highlighted in a 2009 review of occupational licensing for UKCES, there is very limited evidence on the impact of accreditation on training demand. However, the review also suggested that occupational licensing in the US often had negative effects, giving market power to those holding accredited qualifications that led to an increase in wages without an accompanying increase in productivity (suggestive of complete deadweight and even social disbenefits). There is substantial uncertainty as to how these findings might apply to the types of occupational licensing and accreditation is achieved through EIF and GIF infrastructure (such as voluntary licenses to practice), and a range for deadweight of between 60 and 100 percent has been assumed.
- **Creation of new qualifications:** There is no evaluation evidence upon which an assessment of the deadweight loss associated with new qualifications might be based. A range for deadweight derived from a 2009 BIS review of 9 evaluations of interventions examining the impacts of interventions supporting the development of educational infrastructure of between 15 percent and 60 percent.
- **Training networks:** There has been limited quantitative research into the net impacts of networks on training behaviour. These estimates are based on results from a US study (Erickson and Jacoby, 2003) that suggested that members of multiple networks were twice as likely as non-members to invest in training (suggestive of 50 percent deadweight) while membership of a single network led to no impact on training (suggesting complete deadweight).

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<sup>42</sup> A 2011 evaluation of pilot ATAs and GTAs by the National Apprenticeship Service took a wholly qualitative approach.

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